

Technocrane Tracker plugin for Autodesk MotionBuilder

A device solver plugin that receives, visualizes and records data from a Technocrane connected by serial cable or over the network.

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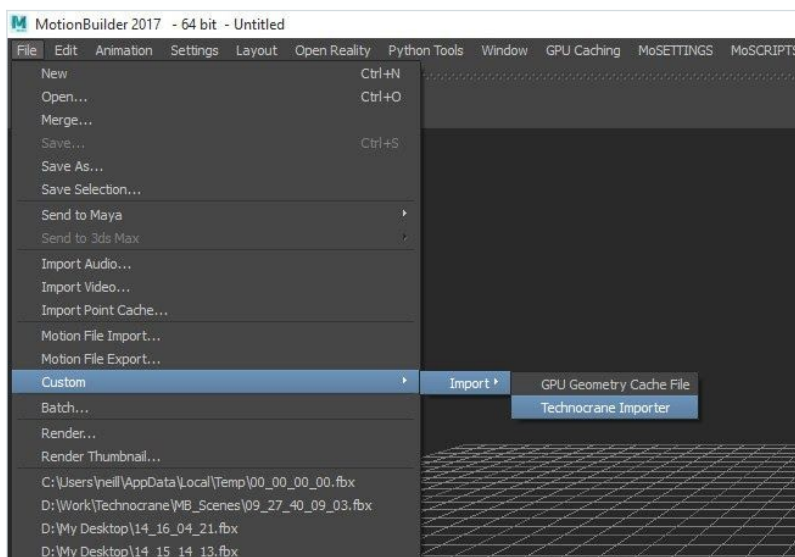
INSTALLATION

The Tracker plugin supports **Autodesk MotionBuilder 2014 up to 2019** and **Windows x64** only.

Use the installation package and follow its instructions to set up the plugin.

TECHNOCRANE IMPORT

Imports ASCII or binary CGI files from the crane.



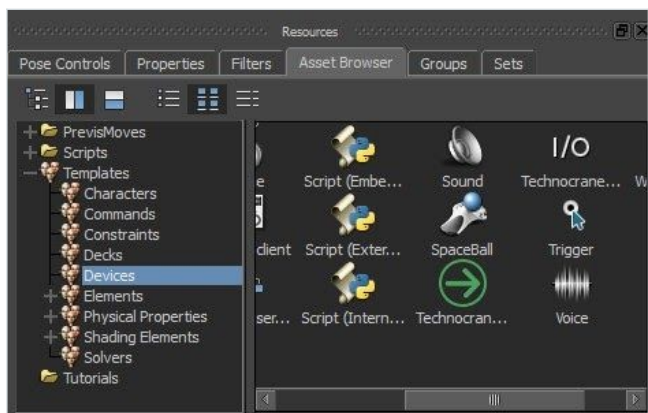
File > Import in MotionBuilder

- Before importing in ASCII format, set the correct frame rate in the scene Transport Controls.
- The binary format uses its own timecode information to insert keyframes.

LIMITATION Timecode is not supported in the ASCII format.

TECHNOCRANE SOLVER (TRACKER)

A device tracker plugin that receives and visualizes data from a crane connected by serial cable.



Technocrane device in the Asset Browser

Features

Compared with traditional device-style plugins, the Tracker adds:

- Custom, user-friendly UI in the Navigator window
- Quick start with automatic connection and serial port selection – ready for recording just after creation
- Interactive HUD system
- Automatic saving of camera data after each recording
- Real-time crane model preview and parametric animation that follows the camera

Before start

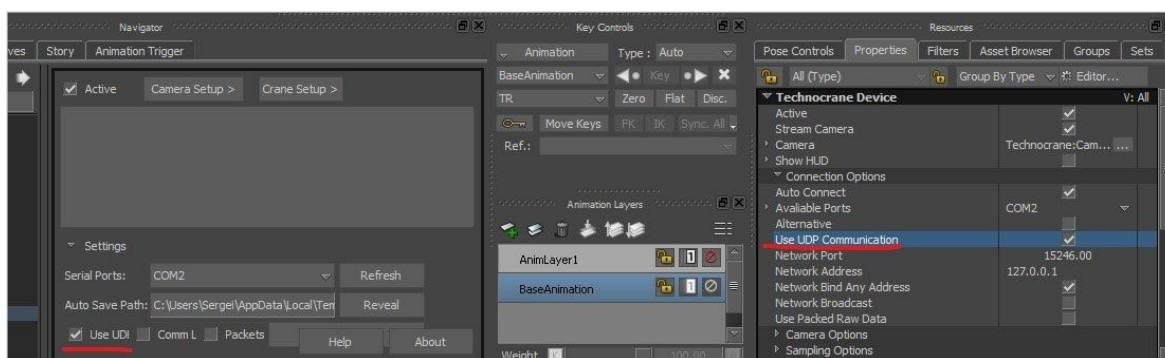
The Tracker is easy to use. Drag and drop a Technocrane device from the Asset Browser into your viewport. The Navigator UI offers the minimum set of options needed to set up and use the device; more advanced setup is done in the Property View.

IMPORTANT The Technocrane device is a **Solver** plugin. You find it in the Asset Browser under Devices like any other device, but once it is in the scene it appears in the **Solvers** branch of the Navigator window, not under Devices.

When you add the device, it tries to connect automatically (Auto Connect is on). It picks the first available COM port in your system. If the crane is connected to another COM port, select it from the Available Ports list. The plugin also creates a virtual camera named **Technocrane:Camera**.

When the device is connected, the **Active** property is checked. To take it offline, clear Active.

IMPORTANT You can switch between serial port and network UDP communication. Use the "Use UDP" checkbox under Settings in the Navigator UI, or the same property under Connection Options in the solver Property View.



Connection settings in the Navigator UI and Property View

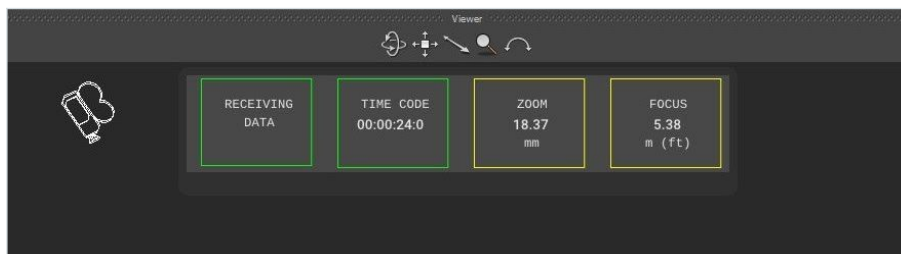
IMPORTANT If you cannot connect to the required COM port, switch to **Alternative** mode before turning on Active. You find the option in the Property View or in the tracker Settings in the Navigator UI.

IMPORTANT Before you start working with the device, set the correct camera frame rate and sensor width and height. This aligns the keyframes correctly and gives an accurate virtual camera FOV.

After each recording, the solver automatically saves the new camera animation to a backup file. The file name contains the timecode of the first recorded frame. Backup files are saved to a temporary folder (the Windows temp folder by default), defined by the **Storage Path** property.

HUD

A special HUD at the top of the viewport shows the common streaming parameters.



HUD in the MotionBuilder viewport

Crane preview

The crane model preview is imported as a new namespace. The crane skeleton nodes are hidden by default and are driven by the Technocrane Tracker.



Crane model preview in the viewport

Preview nodes are driven by the camera rotation and translation, and recording puts keyframes on them. After you turn off streaming, the crane model movement stays in sync with the camera.

Crane preview setup is in the solver Property View or in the solver Navigator UI.

Configuration files

The plugin stores some user values in a configuration file:

`<My Documents>\MB\20xx-x64\config\<PC name>.TechnocraneTracker.txt`

The crane preview model list and camera frame rate presets are stored in an XML configuration file in the MotionBuilder config directory, named **TechnocranePresets.xml**.

Navigator UI

The Navigator UI gives fast access to the common solver options for a quick setup, live preview and recording. The upper toolbar has two buttons, **Camera Setup** and **Crane Setup**, which show the matching options. The **Settings** rollout at the bottom sets the temporary save folder, connection method and port.



Navigator UI



Camera Setup options



Crane Setup options

To get a crane preview, choose your crane model from the list and, if the crane supports it, set the number of tracks. To turn the preview off, choose **None** in the crane list. The **Select Root** button selects the root null object of the crane model so you can position the crane in space.

For advanced customization, use the Property View window.

PROPERTIES



Property View of the Technocrane Device

PROPERTY	DESCRIPTION
Active	Switches the device online / offline.
Stream Camera	Switches between constraining the camera by the incoming packet and using existing keyframes. Useful for creating a parametric crane animation for an already recorded camera movement.
Camera	Current constrained camera.
New Camera	Creates a new virtual camera and assigns it as current.
Show HUD	Turns the HUD on / off.
Show HUD Message Duration	Time a HUD message stays visible.

Connection options

PROPERTY	DESCRIPTION
Auto Connect	Connect right after device creation.
Available Ports	List of ports available in the system.
Refresh	Refreshes the list of available ports.
Alternative	Use another approach to work with COM ports.
Use UDP Communication	Communicate via UDP.
Network Port	Server port.
Network Address	(Optional) Connect to a specified network address.

PROPERTY	DESCRIPTION
Network Bind Any Address	Useful inside a local network – only the port number is needed to connect to a server.
Network Broadcast	Allows several clients to connect to one server port.
Use Packed Raw Data	Must be enabled on a desktop server. Combines calibrated and uncalibrated zoom and focus data in one packet.

Camera options

PROPERTY	DESCRIPTION
Units	Unit type for the camera parameters.
Sensor width	Camera sensor width, used to calculate FOV.
Sensor height	Camera sensor height, used to calculate FOV.

Sampling options

PROPERTY	DESCRIPTION
Use TimeCode Frame Rate	Switches between the timecode frame rate and the user-specified camera frame rate.
TimeCode Frame Rate	Read-only. Frame rate of the timecode value in the incoming packet.
Streaming Rate	Read-only. Number of packets received per second.
Camera Frame Rate	User-defined camera frame rate.
Camera Rate Presets	Presets for the user-defined camera frame rate.

Recording options

PROPERTY	DESCRIPTION
Record Packets From Cache	When off, the tracker captures all frames you see in the viewport according to your evaluation time. This is less accurate but can help if the virtual camera movement looks unordered after recording.
Record Relative Time	When off, the tracker uses incoming timecode values to put keyframes into global time space.
Use Absolute Time Range	Sets the timeline Start and Stop frames from the global-time recording values. Useful when Record Relative Time is off.

Crane options

PROPERTY	DESCRIPTION
Camera Crane Presets	Crane model preview to display in the scene.
Amount Of Tracks	Number of rails under the crane preview model.

PROPERTY	DESCRIPTION
Plot Crane Animation	Records keyframes for the crane model inside the timeline range. Useful when camera keyframes exist but crane model keyframes are missing. To use camera keyframes instead of real-time input, enable Stream Camera.

Auto save options

PROPERTY	DESCRIPTION
Storage Path	Temporary path for auto-saved files.
Auto Save	Saves automatically after each recording.

Camera calibration options

PROPERTY	DESCRIPTION
Zoom Range	2D vector. Interpolates inside the range when zoom is not calibrated and the incoming packet contains a percentage value.
Focus Range	2D vector. Interpolates inside the range when focus is not calibrated and the incoming packet contains a percentage value.
Iris Range	2D vector. Interpolates inside the range when iris is not calibrated and the incoming packet contains a percentage value.
Focus Scale	By default, focus is converted from meters to centimeters ($\times 100$) and connected to the camera Specified Distance for use in DOF visual post-processing.

Crane calibration options

PROPERTY	DESCRIPTION
Camera Pivot Offset	Local camera offset used as the crane attachment point.
Roll Pivot Offset	Stabilization option. Center of roll rotation, used to un-rotate the camera and keep only the physical camera translation for the crane attachment point.
Tilt Pivot Offset	Stabilization option. Center of tilt rotation, used the same way.
Pan Pivot Offset	Stabilization option. Center of pan rotation, used the same way.
Calibrate Pan Offset	Press once to enter calibration mode and again to stop. Pan Pivot Offset is calculated from the samples received during calibration.
Calibrate Tilt Offset	Press once to enter calibration mode and again to stop. Tilt Pivot Offset is calculated from the samples received during calibration.
Crane Calibration Reset	Resets offset values to default.
Crane Calibration Save	Saves offset values to an XML file.
Crane Calibration Load	Loads offset values from an XML file.
Stabilize Crane	Turns crane stabilization on / off (extracts the camera rotation and keeps only the physical translation).
Stabilize Crane Debug Display	Shows helper elements for stabilization.

FAQ

How do I hide the status window on the screen?

Use the **Show HUD** property (see the screenshot below). Once you set it to off, new devices you add will no longer show the HUD – the change is saved as the default in the MotionBuilder config INI file.



Show HUD property

I have a serial cable connected to a COM port, but the plugin cannot connect to it. What should I do?

On some machines the legacy way of connecting to a COM port does not work. Try the alternative connection: turn on the **Alternative** flag in the Navigator UI Settings, or in the Property View of the selected Tracker.

I see a slight movement of the crane model even when I only tilt the camera head. Why?

The crane model is an approximation. The recorded camera move in MotionBuilder is lined up perfectly with the real camera move.

I cannot connect, and my TD desk crashes when I use a new tracker. Why?

A gender swapper on the serial cable was found to be what crashed the TD desk. Remove it from the cable.

SUPPORT AND CONTACT

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