Carrara Enhanced Remote Control (ERC)

The Enhanced Remote Control suite is a set of behavior modifiers and scene commands that work together to add much needed functionality and control to your animation workflow. The package includes:

Commands
Add ERC Modifier
Create ERC Chain
Add Pin Modifier
Delete Keyframes
Remove Duplicate Keyframes
Jitter Keyframes
Property Explorer
Add Slider Modifier

Modifiers
Pin
ERC
Generic Slider

Tweener
ERC

Commands

THE COMMANDS DO NOT SUPPORT UNDO

Add ERC Modifier, **Add Pin Modifier, and Add Slider Modifier** allow you to add the modifiers to the joints of imported Poser figures, which are otherwise locked out of having 3ʳᵈ party modifiers added.

Create ERC Chain allows you to create a chain of basic ERC modifiers. The objects in the chain do not have to be children in the tree!

Delete Keyframes gives you the ability to do a "deep delete" of all of the current keyframes for an object. Set the scene time to the keyframe to be deleted, and select one or more objects to clear. You will be presented with a choice of "Selected Figure" (the default), where every item in each selected animation group will have the current keyframe cleared. "Selected and Children" where only the selected subtrees will be cleared, and "Selected Only", where only the topmost selected items will be cleared.

Remove Duplicate Keyframes analyzes the timelines of the selected items. Any keyframe that is identical to both the preceeding and following frames will be deleted.   You will be presented with a choice of "Selected Figure" (the default), where every item in each selected animation group will have the current keyframe cleared. "Selected and Children" where only the selected subtrees will be cleared, and "Selected Only", where only the topmost selected items will be cleared.

Jitter Keyframes operates on the currently selected keyframes. They will be randomly moved forward or back in time within the limits specified, adding realism to your animation.

Create ERC Chain

Creating a chain of linked modifiers can be very tedious. This helpful command will speed up the basic creation. To get started, select any object and choose the "Create ERC Chain" menu option or press the hotkey.

Click on the "Add New" button to add the Root of your chain. You will first be presented with the standard Carrara "choose object" dialog. Select the item that will be the root of the chain. You will get the Chain Edit dialog:
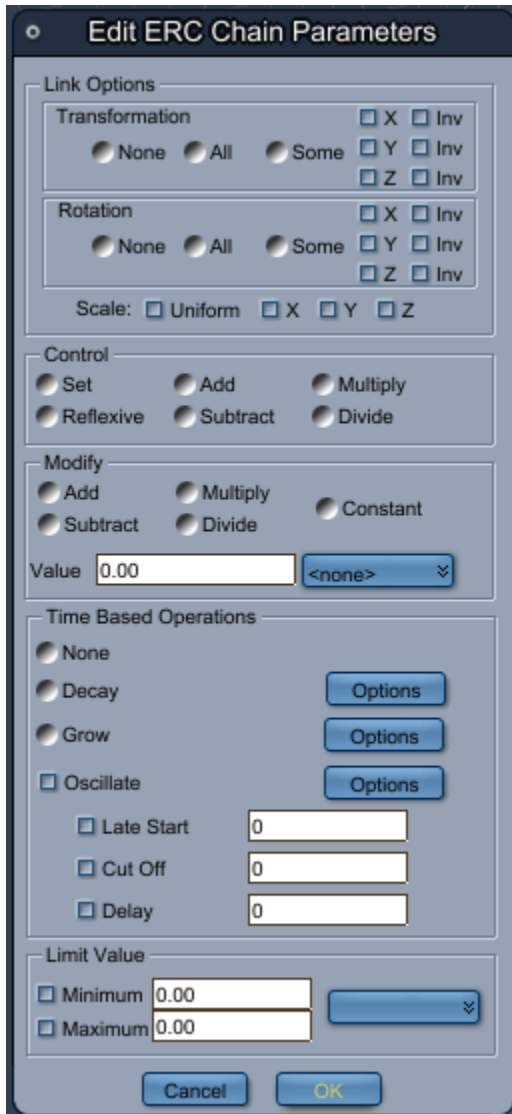
The ERC chain can only automatically set up Basic Mode links. For the descriptions of the various options, please see the main documentation for the ERC Modifier later in the document. When you have set up the root item, click Ok. Your new link will now display in the list.

You can continue to add links one by one with "Add New". They can be any element of any object. You can click "Edit" to make changes to the link parameters, and "Move Up" and "Move Down" to change the sequence. "Delete" will remove a node from the chain.

But the power of the dialog is the "Add Children" button. Click on the node that has children, and click on "Add Children". You will again see the link options dialog. The choices you make will be copied to every node that is a child of the node you selected.

An entry is added for every child.

Branches are not resolved, so items with multiple children (hands, for instance) will have to be edited manually after creating the chain.

If there are links that are not going to work, simply select the offending items and click "Delete".

The default operation is to create a chain, where each item is controlled by the item before it (going from top to bottom in the list). The topmost item will have an ERC modifier, but it will not be controlled by anything.

If you want to create a group of items that all are linked to the same element (the topmost in the list), then check the "Create Group instead of Chain". This will make all of the items after the topmost one controlled by the topmost item in the list. The topmost item will have an ERC modifier, but it will not be controlled by anything.

When you are ready, click on "OK". The command will automatically add an ERC modifier to each item, setting it to be controlled by the item above it.

Once again, the root node will get an ERC modifier, but it will not be enabled.

Property Explorer

Sometimes it can be difficult to guess what you are trying to do with the ERC modifier. The Property Explorer can help guide you.

Select an object, and then select "Property Explorer" from the "Fenric" submenu of the "Edit" menu. (or press the hotkey, which defaults to ctrl-shift-x). The property window will open.
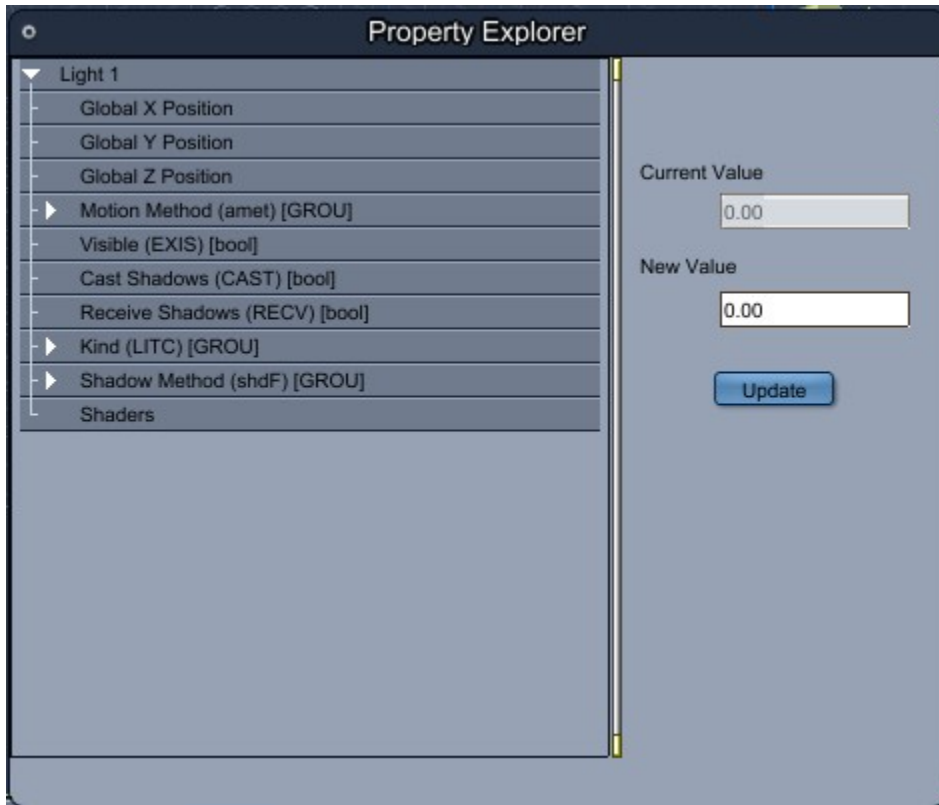

The list contains the same set of properties as are available in the ERC setup. Clicking on a property will display its current value, and you have the ability to set a new value by entering it in the "New Value" box and clicking "Update".

Dismiss the window by clicking the small circle in the upper-left corner.

Pin Modifier

The Pin modifier attempts to fix the location of an item in XYZ space. It cannot override the motion of parent items, so it is a best-effort lock rather than an absolute one.
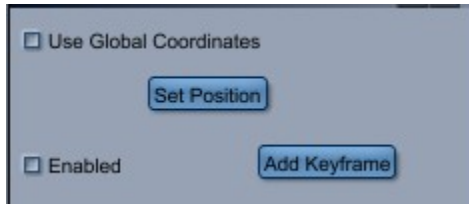
If "Use Global Coordinates" is checked, the modifier will store and use global coordinates rather than local.

Click the "Set Position" button to store the current location of the item

When "Enabled" is checked, the modifier will attempt to return the item to the stored position anytime it is moved.

If you click "Add Keyframe", the stored position is added to the current scene time as keyframes.

ERC Modifier

The Enhanced Remote Control modifier is the main feature of the product.

Control a value, With a value, From any object in your scene

It supports the following control types

SET: result = control
REFLEXIVE: result = result
ADD: result = result + control
SUBTRACT: result = result - control
MULTIPLY: result = result * control
DIVIDE: result = result / control

It supports the following modifications:

ADD: control + value
SUBTRACT: control - value
MULTIPLY: control * value
DIVIDE: control / value
CONSTANT: ignore "control", use value instead

It allows the following operations based on the scene time:

DECAY: The amount of remote control is decreased over time
GROW: The amount of remote control is increased over time
OSCILLATE: The final value is scaled in an oscillating fashion
LATE START: Remote control will not begin until the entered time
CUT OFF: Remote control will be discontinued at the entered time
DELAY: Remote control will store up changes but delay their effect

In Carrara, the INTERNAL representation of items are as follows:

Translation: INCHES
Rotation: RADIANS
Time: FRAMES
Scale and Morphs: 0.0 to 1.0 (by default)

When trying to figure out what value to set and what needs to be, keep in mind the internal units.

Using the ERC Modifier

Important notes

The ERC Modifier only works with a rotation method of Angles. It is not compatible with Quaternion rotation.

The ERC Modifier only works with a constraint style of FULL or NONE. It is not compatible with any other constraint style.

The ERC Modifier is accessing many components through the "back door". There will be parameters that are displayed, but will not respond as they were never intended to be animated.

A parameter can only be controlled by a single instance of the ERC Modifier. If you specify the same parameter in multiple controllers, only one of them will take effect, and the others will be ignored. This is a limitation of the Carrara modifier system.

The Modifier is subject to the same limits as the IK tracking modifier. Particularly, if you save a figure to the browser and attempt to load more than one instance of it to the same scene, the second and subsequent instances will be controlled by the first. You will need to manually edit the ERC Modifiers to change the controller to the proper instance.

Select the item that you want to control, and then use the "Add ERC Modifier" command from the "Fenric" sub-menu of the main "Edit" menu. *Please do NOT use the "+" menu on the Modifiers tab to add the ERC Modifier.*

Basic Mode
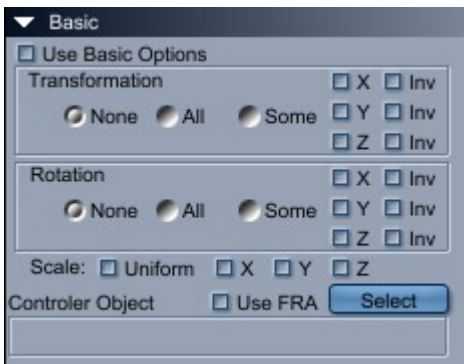
Basic mode allows you to quickly and easily set up a link between the current object and some other object. You can link any or all of Global Transformation, Rotation, and Scale.

If you want none of the parameters in a group, select "None".

If you want all of the parameters in a group, select "All"

If you want to choose, select "Some" and then check the options you want.

If you need to invert the sign of a parameter, click on the "Inv" checkbox next to it. Inverting takes effect with either "All" or "Some" selections.

"Use FRA" activates an alternate mode of finding the Controller Object, in which the current figure is searched for the name that you selected, rather than relying on the internal object tracking. This will help the controller remain functional across being saved to the browser and reloaded BUT it has two significant limitations: First, it only can find objects that are part of the same figure. Second, it searches by name, and so the names must be unique.

Choose the object that will control the current object, and then check the "Use Basic Operations" checkbox.

Advanced Mode

If Basic Mode is enabled, Advanced Mode is IGNORED
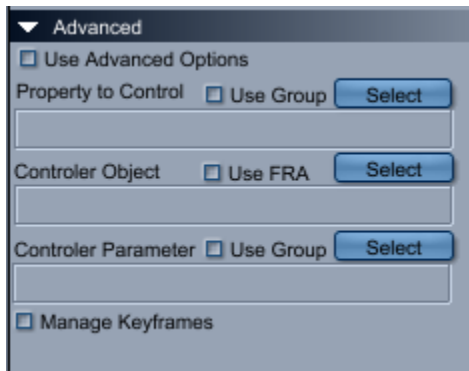
Your first task is to select the property to be controlled. If you need to control a property that is up in the Animation Group, click on "Use Group", but note that this will be slower than choosing a property from the current object. Click on the "Select" button:

Expand the nodes and find the value that you want to control. Select it, then click on OK. The name and ID of the parameter will be displayed in the "Property to Control" box.

If you want to control the property from a different object than the current one, click on select next to "Controler Object". You will be presented with the standard Carrara object selection dialog, from which you can choose the object to act as the controller.

If you want to control the property from the same object that the ERC modifier is attached to, then leave the Controler Object blank.

"Use FRA" activates an alternate mode of finding the Controller Object, in which the current figure is searched for the name that you selected, rather than relying on the internal object tracking. This will help the controller remain functional across being saved to the browser and reloaded BUT it has two significant limitations: First, it only can find objects that are part of the same figure. Second, it searches by name, and so the names must be unique. If you choose "Use FRA", then the object name cannot be blank.

Select the parameter to act as the control by clicking on Select next to the Control Parameter field. This will bring up the same parameter selection dialog box. Select the parameter and then click on OK.

You can skip the Control Parameter selection entirely if you are using either the "Reflexive" control type, or the "Constant" modifier.

Manage Keyframes

Some parameters will only respond to keyframes. If you run into this situation, you will need to select this checkbox.

When keyframes are being managed, the ERC Modifier takes complete control of the timeline for that parameter during the time-span controlled by the modifier. If either "Late Start" or "Cut Off" are in affect, then the modifier will honor those limits and will not disturb keyframes outside of that time span.

The Modifier begins by clearing all keyframes from the parameter at the start time (Either 0 if Late Start is not set, or the specified frame number is Late Start is set). It will then generate keys at each change in the parameter's value. While you are working, you may find that this creates many extraneous keyframes (particularly if you drag the current time around with the mouse. Simply rewind to the start (or Late Start) frame, and all of the extra keyframes will be deleted.

NOTE: You cannot manage keyframes for the three global position parameters, as there is no global position key type. (There is also no need to do that).

Options for both modes

The following options apply to BOTH modes.

Control Type
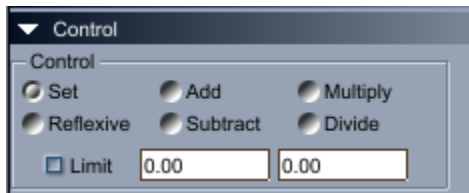
The radio buttons under "Control" determine the type of control that you need. This group starts off blank, as some of the options (particularly divide) are sensitive to having valid values set up. You must pick a control type.

Set. The value of the property to control is set to the value of the controlling property, modified by any modifiers.

Reflexive. The value of the property itself is used as the controller. This means that the property value will appear twice in most circumstances.

Add. The value of the controlling property, modified by any modifiers, is added to the value of the property to control.

Subtract. The value of the controlling property, modified by any modifiers, is subtracted from the value of the property to control.

Multiply. The value of the controlling property, modified by any modifiers, is multiplied with the value of the property to control.

Divide. The value of the property to control is divided by the value of the controlling property, modified by any modifiers.

Limit. If checked, clip the input value between the first and second values. This lets you limit the range of the ERC's changes without needing to calculate the final value and limiting it that way.

Modification Type

The radio buttons under "Modify" change the nature of the value of the controlling property, using the number entered in "Value".

Add. The Value is added to the value of the Control Property

Subtract. The Value is subtracted from the value of the Control Property

Multiply. The value of the Control Property is multiplied by the Value

Divide. The value of the Control Property is multiplied by the Value

Constant. The value of the Control Property is REPLACED with the Value.

Value. The value that you are using to modify with.

Unit drop-down

The value is generally used as-is. This can be confusing for some parameters where the Carrara UI displays a different value than the parameter is actually storing. If you select a unit in the drop-down, then the modifier will make a best-effort to convert the value before applying it.

Offsets are stored internally in Inches – regardless of any scene setting. The value will be interpreted as inches unless you specify a unit in the drop-down.

Rotations are stored internally in Radians. This is highly inconvenient for end users, and so when using values for rotations, you may select "Degrees".

Time Based Operations
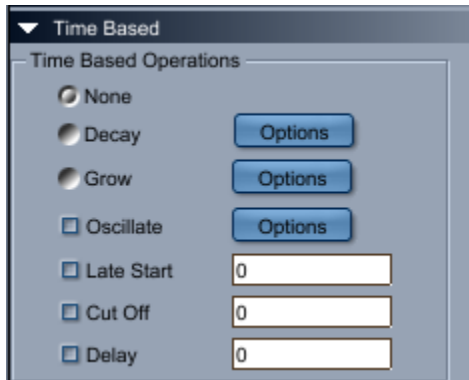
The time based operations allow you to change the behavior of the modifier with respect to the animation timeline.

Decay. If decay is set, the amount of remote control is scaled by a gradually decreasing amount. This becomes a factor that is multiplied onto the Control Value, and gradually reduces the amount of change. Decay is based on the time that the controller is active, and is affected by the Late Start and Cut Off options.

The Decay options control this change.
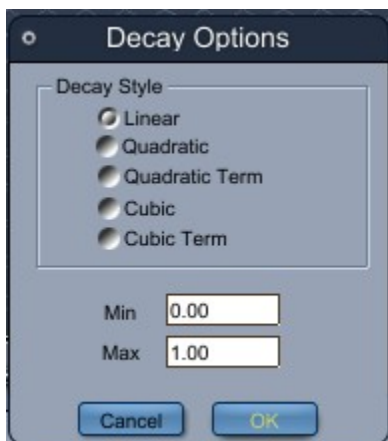
The **Min** and **Max** values control the upper and lower bounds. Decay starts at "Max" and progresses toward "Min" according to Max – f(t)

Decay Style controls how quickly or slowly the change takes effect by selecting f(t)

Linear: A simple linear falloff. (dark blue)

Quadratic: f(t**2) – f(t): falls off more quickly, will reach Min before the end of the timeline. (yellow)

Quadratic Term: f(t**2): falls off more slowly, will never reach Min (pink)

Cubic: f(t**3) – f(t**2) – f(t): falls off VERY quickly, will reach Min early. (purple)

Cubic Term: f(t**3): falls off very slowly (pale blue)
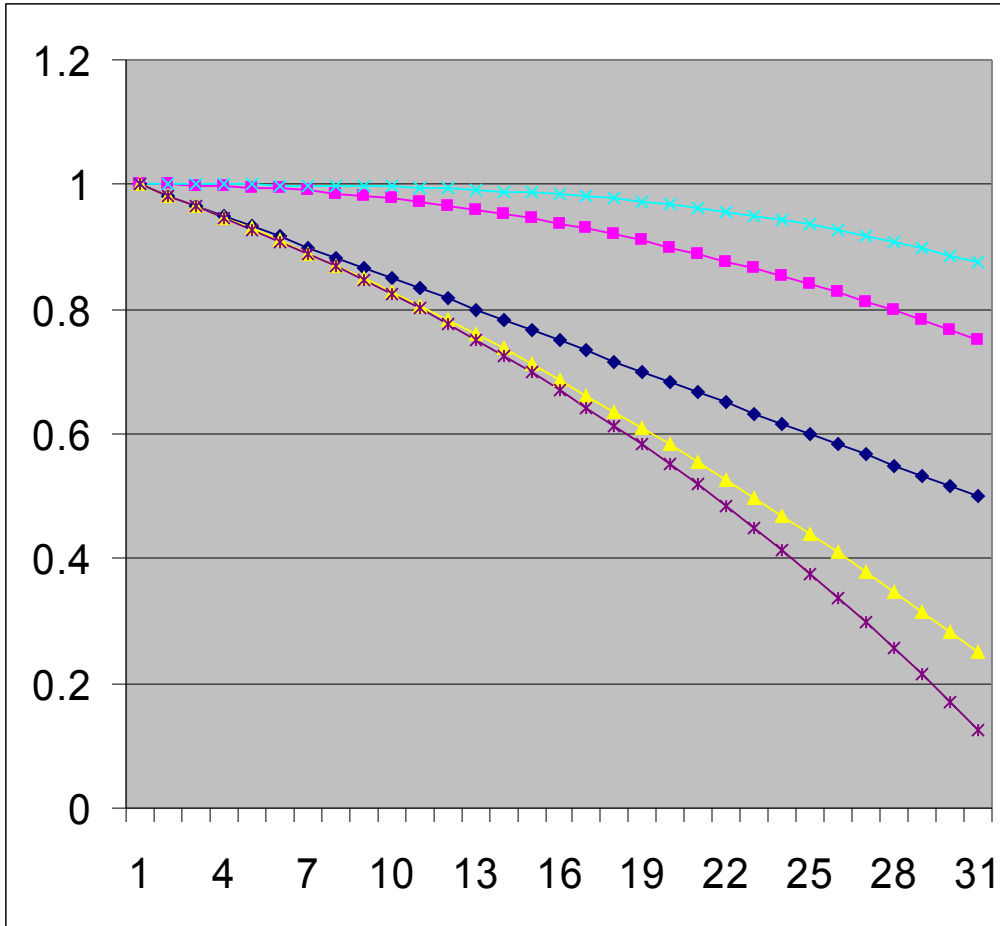
Grow. Grow is the inverse of Decay. It starts at Min and heads toward Max as Min + f(t). The options are the same as Decay.

Oscillate. If oscillate is set, the amount of control is modified according to a Sine or Cosine wave. The phase of the timeline is corrected so that the oscillation begins by default at zero degrees.
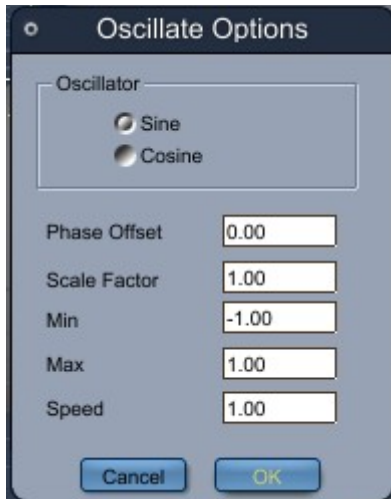
Sin. Control according to a sine wave. This starts at zero and oscillates between -1 and 1.

Cos. Control according to a cosine wave. This starts at one and oscillates between -1 and 1.

Phase Offset. Add an offset in radians to alter the starting position away from zero or 1.

Scale Factor. Multiply the oscillation by this amount.

Min. Prevent the oscillation from going below this amount.

Max. Prevent the oscillation from going above this amount.

Speed. The rate at which the oscillation happens. Set to a fraction to slow it down. Set to a whole number to speed things up.

Timeline Control

Late Start. Do not begin controlling until the frame number supplied. Decay, Grow, and Oscillate are affected by this setting.

Cut Off. Discontinue control after the frame number supplied.   Decay, Grow, and Oscillate are affected by this setting.

Delay. Delay the remote control by this many frames. Control events are queued up and will be acted on in the order they were received once the delay has expired.

Global Options

Sometimes, you need to ensure the maximum and minimum limits for the changes that the modifier makes. Check the appropriate box and enter the value you want – the final value of the parameter will not exceed the bounds you check.

Unit drop-down

The value is generally used as-is. This can be confusing for some parameters where the Carrara UI displays a different value than the parameter is actually storing. If you select a unit in the drop-down, then the modifier will make a best-effort to convert the value before applying it.

Offsets are stored internally in Inches – regardless of any scene setting. The value will be interpreted as inches unless you specify a unit in the drop-down.

Rotations are stored internally in Radians. This is highly inconvenient for end users, and so when using values for rotations, you may select "Degrees".

Absolute Mode works directly with the current controller values as they exist in the timeline. This is the default operational mode. Usually you will use the "Set" control style with this.

Relative Mode calculates the difference between the previous and current values, of the controller, and applies the difference to your parameter. Usually you will use the "Add" control style with this.

Change Title allows you to set the title of the modifier in the Modifiers tab. This is useful if you need to create many instances and need to keep track of which is which.

Save and **Load** allow you to save a version of the parameters to a file (and load them again). It is only useful for exchanging settings between the Modifier and the Tweener. For saving presets, use the standard Carrara save/load icons.

ERC Tweener

Sometimes, the item you wish to control will simply not be available to the modifier. If the item is visible in the Sequencer, you can add the ERC tweener to it. The ERC Tweener has a subset of the options available to the modifier.

Select the tweener that you want to change to ERC, and then select "ERC" from the tweener-type drop down list.
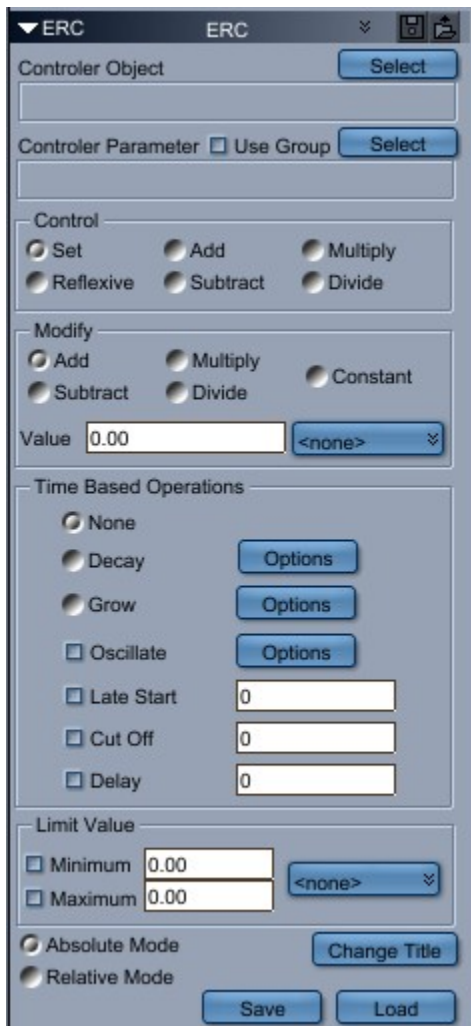
Changes from the Modifier:

There is no "parameter" to select, as the tweener is operating on the current timeline.
The tweener only supports "Advanced" mode.
There is no concept of a figure at this level, so the FRA option is not available.
The control is not subject to limits, as the values are coming from the keyframes.

Generic Slider

The generic slider modifier replaces the former "Change Morph Limits" command. Change Morph Limits only worked for native Carrara figures and as such, was extremely limited in its usefulness.

The generic slider places a slider on an element which can control any of the properties of that element. It is not a remote control – it can only affect properties of its own element. Click on the "Set" button to choose the property.

The limits are dynamic and you can change them at any time – simply modify the values in the "Min" and "Max" boxes.