SimROBOT 0

for

ROBONOVA-1

Operation Manual

(Ver 0.01)

for Windows® XP

July 2, 2008

Hitec RCD Korea,Inc.

Contents

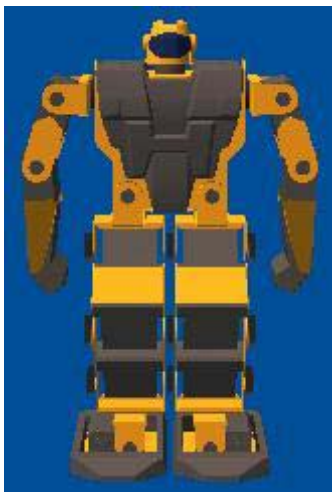
< Starting Up >

1. Launching the Assistant

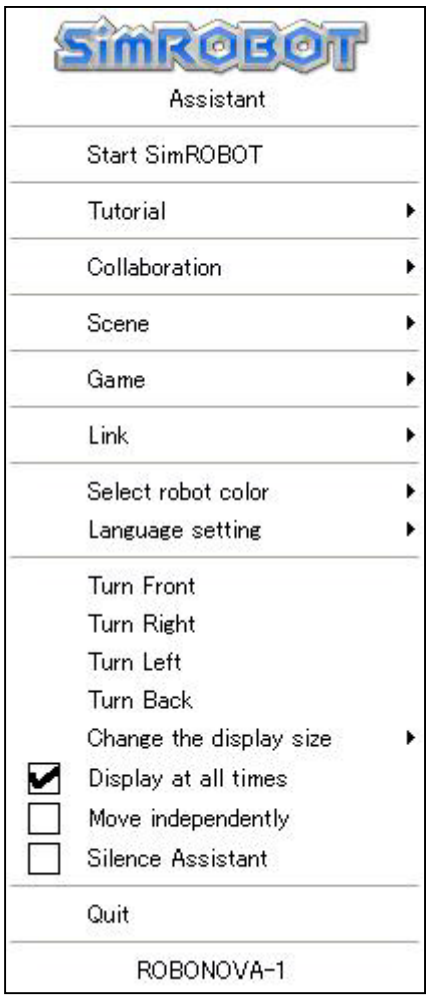
From the Start menu, select "All Programs" -> "HITEC" -> "SimROBOT0" -> "SimROBOT0" to launch the Assistant.

The Assistant will appear onscreen as illustrated below.

Align the mouse pointer with the Assistant and press the right button to display the Assistant menu.



Assistant



Assistant Menu

2. Assistant Menu

a . [Start SimROBOT]

Launch the [SimROBOT] application in Normal mode.

b . [Tutorial]

Launch the [SimROBOT] application in Tutorial mode.

Learn the basic motion authoring commands in stages by following the step by step instructions.

* During the tutorial, functions outside the range of instruction will generally not be available.

c . [Collaboration]

Launch [SimROBOT] in Collaboration mode. This is a tutorial on combining your robot's motion with video or music.

d . [Scene]

Launch [SimROBOT] in Scene mode. This is a tutorial on referring to background and other scene details while authoring your robot's motion.

e . [Game]

Launch a variety of games.

Refer to the separate instruction manuals for details of each game.

f . [Link]

Opens the HITEC website with the default browser.

g . [Choose the color of your robot]

Change the color of the robot shown in the [SimROBOT] 3Dview.

* The Assistant color cannot be changed.

h . [Language setting]

Changing Display Language.

Changes the display language of both the Assistant and SimROBOT applications

i . [Face Front]/[Turn Left]/[Turn Right]/[Face Back]

Choose the direction the Assistant faces.

j . [Change the Display Size]

Change the size of the Assistant display.

k . [Display at all Times]

If this box is checked, the Assistant will always be shown in front of other windows.

l . [Move Independently]

If this box is checked, the Assistant will move about the screen of its own free will.

m . [Silence Assistant]

If this box is checked, the Assistant will stop speaking and remain silent.

n . [Quit]

The Assistant disappears and the application SimROBOT shuts down.

3. Other Assistant Functions

a . Taskbar icon

When the application is running, the Assistant icon will be displayed in the Windows® Taskbar. **Right-click this icon to display the Assistant menu.**

Assistant Icon

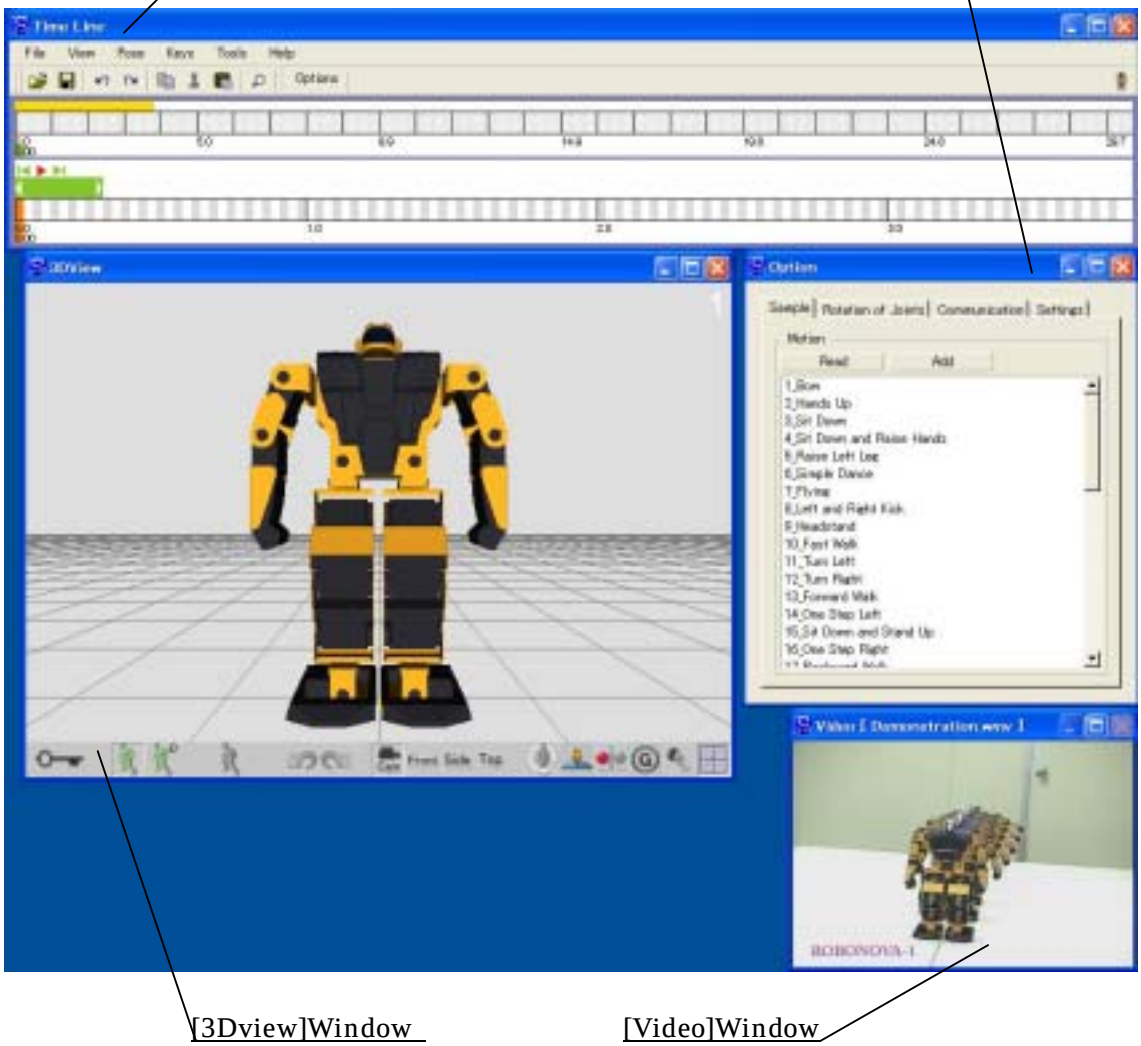
b . SimROBOT Assistant button

At the far right of the SimROBOT Time Line window is the Assistant button. **Click this to close SimROBOT and relaunch the Assistant.**

Assistant Button

< Naming Conventions >

The names used to refer to each window in SimROBOT are as follows:



< Posing >

SimROBOT allows the formation of basic (Key) poses (Key-poses), and for these to be set in the Time Line as Keyframes to produce motion.

Posing is performed as below.

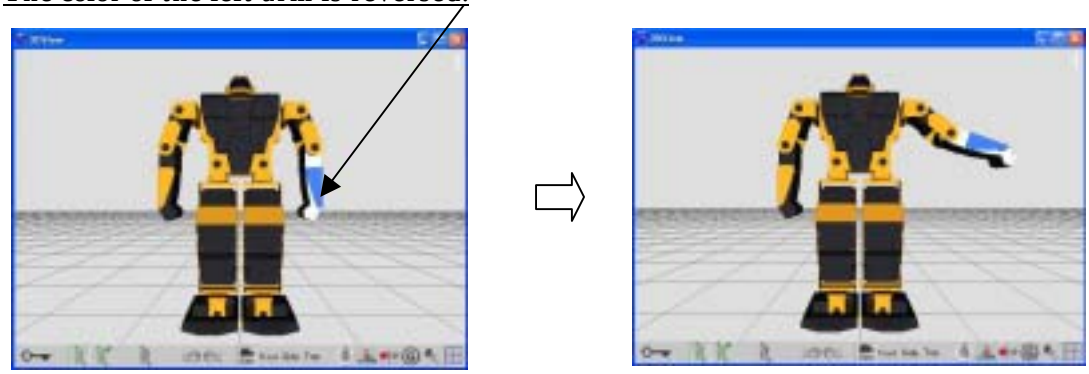
[Basic Controls for Posing]

1. Posing Limbs

a . Align the mouse cursor with the robot shown in the 3Dview window. The color of the joint aligned with the mouse cursor will reverse.

b . Drag the joint while the color is reversed to reposition it.

The color of the left arm is reversed.



SimROBOT has two modes for posing by dragging; **IK mode (Inverse Kinematics)** and **FK mode (Forward Kinematics)**.

In FK mode, only the color reversed part moves, whereas **in IK mode, all parts between the color reversed part and the torso move together;** in the case that arm or leg parts other than the hands or feet are selected, the outside joint of the selected part will not move.

At launch, the mode defaults to IK mode. Modes are switched by clicking the icon to the lower left of the 3Dview window. You can also press the K key to switch modes when the 3Dview window is active.

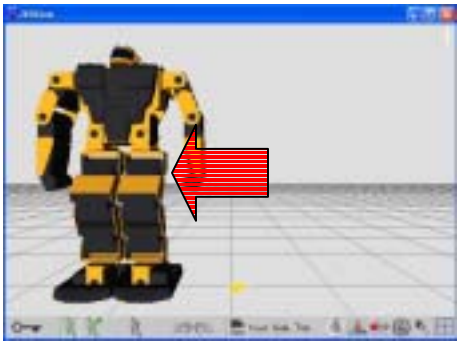
 IK Mode Icon

 FK Mode Icon

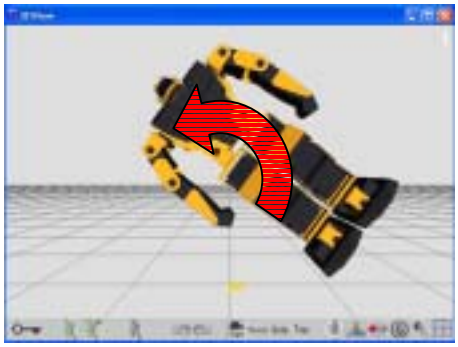
2. Full Body Posing

a . If you wish to move the robot in its entirety, then drag the torso in IK mode.

b . If you wish to rotate the robot in its entirety, then drag the torso in FK mode.



Full Body Move (IK Mode)

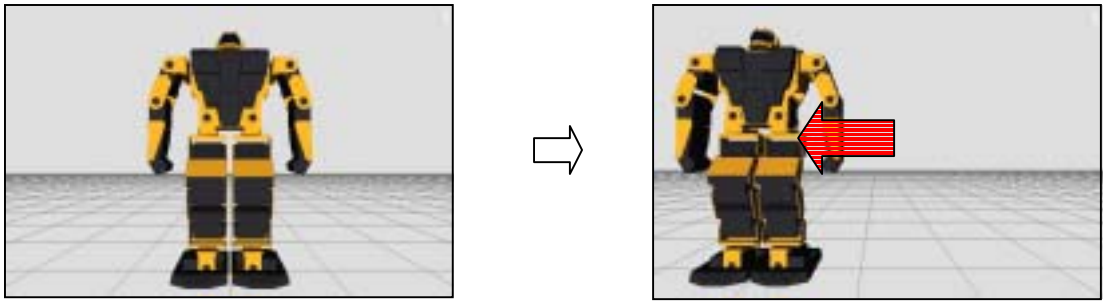


Full Body Rotate (FK Mode)

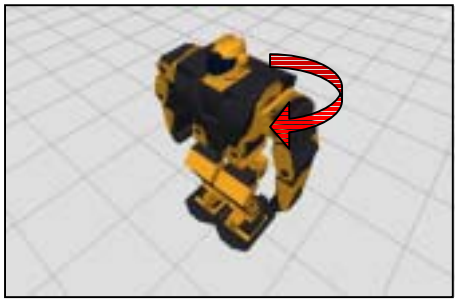
3. Moving/Switching Viewpoint

If you switch the SimROBOT viewpoint setting between Camera, Front, Side, or Top Down, the view will be reflected in the 3Dview window. By viewing from different angles, you can get a clearer grasp of the pose.

a . To move the viewpoint horizontally and vertically, then middle-click-drag the pointer within the 3Dview window, or left-click-drag the pointer on a section of the 3Dview window away from the robot.



b . To rotate the view around the robot, right-click-drag the pointer within the 3Dview window.



c . To change the viewpoint to Front, Side, Top Down, etc., click the appropriate "Switch Viewpoint" icon at the bottom of the 3Dview window. Clicking more than once will toggle between front and rear, left and right, and top down and bottom up (display changes from black letters to white letters).

d . To zoom in/out, left-click and right-click-drag the pointer within the 3Dview window, or hold down the Ctrl key and middle-click-drag the pointer. Drag up to zoom in, or down to zoom out.

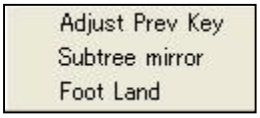
e . To set the view to the optimal size, double-click within the 3Dview window away from the robot. The robot will be displayed at optimal size at the center of the window.

[Joint Menu]

Menu for posing functions by specifying a single joint.

1. Display Joint Menu

a . **Right-click a joint while the color is reversed to display the Joint menu as illustrated below.**



2. Adjust Prev Key

a . **Select "Adjust Prev Key" from the Joint menu to move the entire body so that the color reversed part matches its position in the previous Keyframe.** While animating walking, this is useful for keeping one foot planted in place.

3. Subtree Mirror

a . **Select "Subtree Mirror" from the Joint menu to make all parts extending outward from the color reversed part (on the opposite side of the torso) symmetrical with the selected limb.**

4. Foot Land

a . **Select "Foot Land" from the Joint menu to move the underside of the color reversed foot flat onto the surface.**

[Other Posing Support Functions]

SimROBOT features a variety of additional tools to assist you in posing your robot. These can be accessed via the Pose menu in the Time Line window, icons at the bottom of the 3Dview window, and keyboard shortcuts.

Pose Menu in the [Time Line] window

1. Undo Pose/Redo Pose

a . To undo a change to a pose, click the "Undo Pose" icon at the bottom of the 3Dview window. Press multiple times to cycle back through the last 30 changes. To redo the poses you have undone, press the Redo Pose icon at the bottom of the 3Dview window.

 Undo Pose

 Redo Pose

This function can also be found in the Pose menu in the Time Line window. Additionally, you can use "Ctrl + Z" to undo poses and "Ctrl + R" to redo poses while the 3Dview window is active.

2. Displaying/Hiding Grid

a . To switch the grid display on/off, press the "Grid Display" icon at the bottom of the 3Dview window. The grid representing the ground surface will be displayed or hidden. The default setting is on. When the viewpoint is set to Front, Side, or Top Down, the grid will be displayed perpendicular to the angle of sight.

 Grid Icon

3. Mirror Mode (Symmetrical)

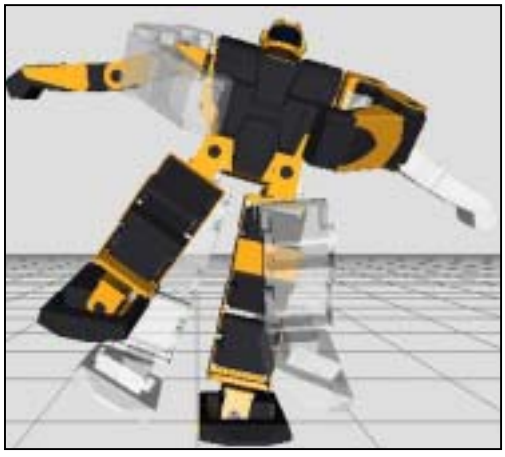
a . To make a pose symmetrical from left to right, click the Mirror Mode icon at the bottom of the 3Dview window, and set Mirror Mode to ON. Any changes made to the pose on one side of the robot will be automatically reflected on the other. To switch Mirror Mode to OFF, click the Mirror Mode icon again.

Mirror Mode icon

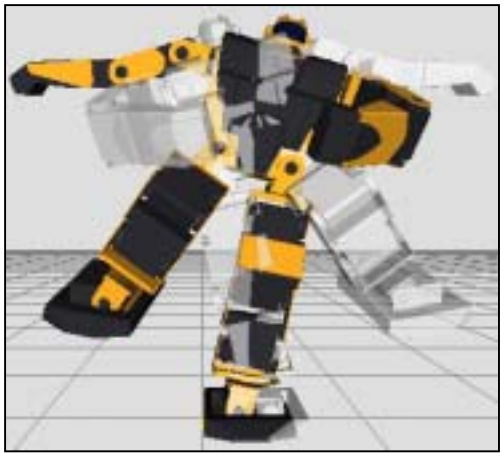
Example of a Mirror Mode Pose

4. Flipping (Reverse Left and Right)

a . To reverse the pose settings from left to right, select "Local Flip" from the Pose menu of the Time Line window. All settings for the left arm and leg will be moved to the right arm and leg, and vice versa. Alternatively, select "World Flip" to also reverse the angle and position of the body in relation to the surrounding space. The same effect can be achieved by pressing the F key for Local Flip, and Ctrl + F for World Flip. Keep in mind that Keyframes are not automatically set, so be sure to set changes in the Time Line.



Local Flip



World Flip

5. Resetting

a . To reset the pose to its default position, click the “Reset” icon at the bottom of the 3Dview window, or select "Reset" from the Pose menu of the Time Line window. You can also achieve the same effect by pressing the H key while the 3Dview window is active.

 Reset icon

6. Foot Land

a . To position the robot on the surface, click the “Foot Land” icon at the bottom of the 3Dview window. The robot will move vertically until its lowermost part touches the grid representing the surface.

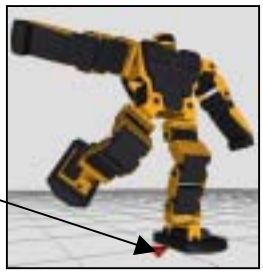
 Foot Land icon

7. Displaying Center of Gravity

a . To check the robot's center of gravity, click the “Center of Gravity” icon at the bottom of the 3Dview window. A red cone will be displayed immediately below the robot's center of gravity.

 Display Center of Gravity icon

Position Directly Under Center of Gravity



* The center of gravity displayed is based on an estimate, and is not guaranteed to be 100% accurate.

8. Pose Save/Pose Load

a . To save a pose to a file, select "Pose Save" from the Pose menu of the Time Line window. The file selection dialog box will be displayed. Select a folder to save to, enter a filename and click OK. The pose shown in the 3Dview window will be saved in the specified file.

b . To load a previously saved pose, select "Pose Load" from the Pose menu of the Time Line window. The file selection dialog box will be displayed. Select a file and click OK, and the selected pose will be displayed in the 3Dview window. Keep in mind that Keyframes are not automatically set, so be sure to set changes in the Time Line.

* The saved pose data does not include the position or direction the robot is facing.

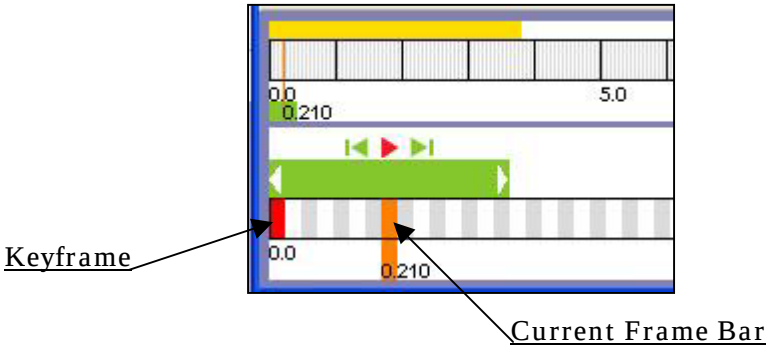
9. Editing Motion and Reflection

a . For information on the more advanced controls (Ghost Display, Motion Mode etc.) see Collective Editing of Poses .

[Setting Keyframes]

In SimROBOT, the Time Line is broken down into units (cells) referred to as Frames. One Frame is equal to of 30ms (milliseconds). When a specified pose (Key Pose) is set into the Time Line, that Frame is known as a Keyframe. **Keyframes are shown in red**, and the **Current Frame is displayed as the orange Current Frame bar**.

By setting a series of Keyframes into the Time Line, you are able to create motion.



1. Setting Keyframes

a. When you have prepared a pose to set, click the Key icon at the bottom of the 3Dview window. The pose displayed in the 3Dview window will be saved to the Time Line as a Keyframe. In the Time Line window, the Keyframe will be marked in red. The same effect can be achieved by pressing the Spacebar.

Key icon

b. Once the Keyframe is set, drag the orange Current Frame bar to the position you would like the next Keyframe BEFORE you prepare the next pose.

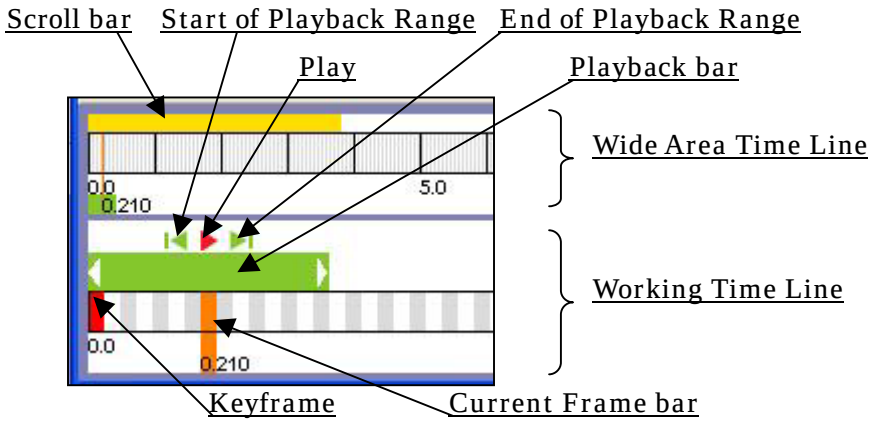
c. In the Settings tab of the Options window, you can see the Max and Current Keyframe Count for reference. If the limit is reached, you will not be able to set any more Keyframes.

< Editing Motion >

Once a number of Keyframes have been set, you can adjust motion by editing the Time Line directly. You can also make changes to the pose from the 3Dview window.

[Time Line]

The Time Line is constructed as illustrated below.



1. Basic Functions of Time Line

a. The Scroll bar's position on the Wide Area Time Line corresponds with the current Working Time Line. By dragging the Scroll bar, the area shown in the Working Time Line will move.

b. To move the Scroll bar quickly to an area further away on the Wide Area Time Line, middle-click the target area and it will jump straight there.

c. Both the Wide Area Time Line and the Working Time Line can be scrolled by dragging directly.

d. Press the "Home" key to move the Wide Area Time Line to the far left, or the "End" key to align with the final Keyframe.

e. Press the "Page Up" key to scroll the Wide Area Time Line one screen to the right, or the "Page Down" key to scroll one screen to the left.

f. The Working Time Line can be zoomed up to three stages by clicking the Zoom button.

2. Motion Playback/Moving Current Frame

SimROBOT allows you to check your motion as playback, or as individual poses Frame by Frame by moving the Current Frame.

a . To playback motion, click the red Play button within the Time Line window. The Current Frame bar will move as playback progresses. The motion within the Playback Range will be played back and displayed within the 3Dview window. During playback, the Play button will become a Pause button, so click to pause playback. The same effect can be achieved by pressing the "Enter" key. By selecting "Auto Return" from the Time Line Tool menu, the Current Frame bar will return to the start upon completion of playback.

b . To extend the range of playback, drag either end of the Playback bar (marked by white triangles) within the Time Line window.

c . To move the Playback bar, middle-drag the Playback bar within the Time Line window to the desired position.

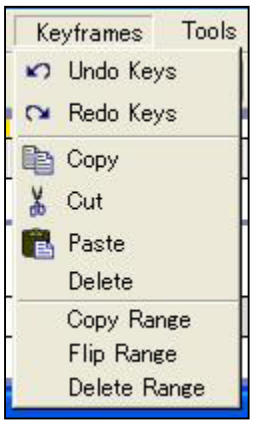
d . To set the Playback Range to the entire animation, double-click the Playback bar, or press "Ctrl + A" while the Time Line or the 3Dview window are active.

e . To move to the first or last Frame of the current Playback Range, click the button to the immediate left or right of the Play button.

f . To move the Current Frame bar one Frame forward or backwards, press the "left arrow" or "right arrow" keys, or rotate the mouse wheel while the Time Line or 3Dview window are active.

3. Editing Keyframes

Keyframes can be freely moved, copied and pasted. Editing functions are mostly performed by selecting from the Keyframe menu in the Time Line window as illustrated below, or via keyboard shortcuts.



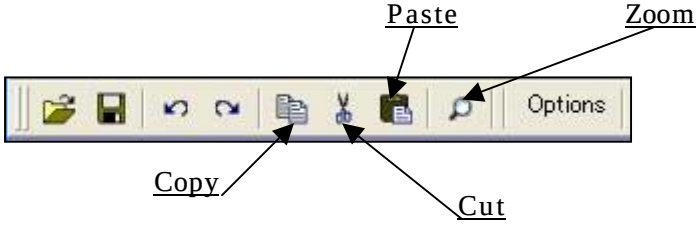
a. To move a Keyframe, simply drag it left or right. Note that the Frame to the furthest left (the first Frame) cannot be moved further left.

b. Right-click-drag a Keyframe to simultaneously move all Keyframes in the direction being dragged towards together. Note that the Frame to the furthest left cannot be moved further left.

c. Right-click-drag a Keyframe while holding down the "Shift" key to simultaneously move all Keyframes in the opposite direction to that being dragged to together. Note that the Frame to the furthest left cannot be moved further left.

d. To delete a Keyframe, drag it to the Trash Can icon immediately above.

e. The icon bar in the Time Line window contains icon commands Copy, Cut, and Paste. Click the appropriate icon to Copy, Cut, or Paste the currently selected Keyframe. The same effect can also be achieved by pressing "Ctrl + C" for Copy, "Ctrl + X" for Cut, and "Ctrl + V" for Paste.



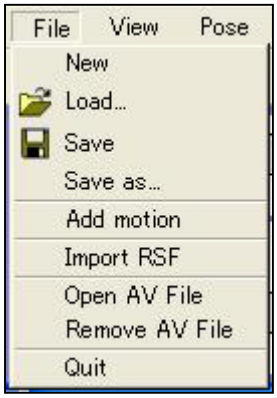
f . To delete all Keyframes within the Playback Range, select "Delete Range" from the Keys menu of the Time Line window. The same effect can be achieved by pressing Ctrl + D.

g . To Copy and Paste all Keyframes within the Playback Range, select "Copy Range" from the Keys menu of the Time Line window. Copied Keyframes will be pasted into the current Frame and beyond. The same effect can be achieved by pressing Ctrl + Y.

h . To World Flip all of the Keyframes within the Playback Range, select "Flip Range" from the Keys menu of the Time Line window.

[Saving/Loading Motion Data]

In SimROBOT, motion data can be saved, loaded or added via the File menu of the Time Line window.



File Menu

1. Saving Motion

a . Select "Save" from the File menu of the Time Line window, and a confirmation message will be displayed. Click "Yes" to save the motion currently set within the Time Line. If no Keyframes have been set, then a message will be displayed and the data will not be saved. If a filename for the motion has not previously been created, then "Save as..." will be activated instead.

b . Select "Save as..." from the File menu of the Time Line window, and the file selection dialog box will be displayed. Select a folder and enter a filename, then click OK to save the motion currently set within the Time Line to the designated file. If no Keyframes have been set, then a message will be displayed and the data will not be saved.

2. Loading Motion

a . Select "Load" from the File menu of the Time Line window, and the file selection dialog box will be displayed. Select a file with a ".srm" extension to load, and click OK to REPLACE the current project's Time Line with the file's content.

3. Adding Motion

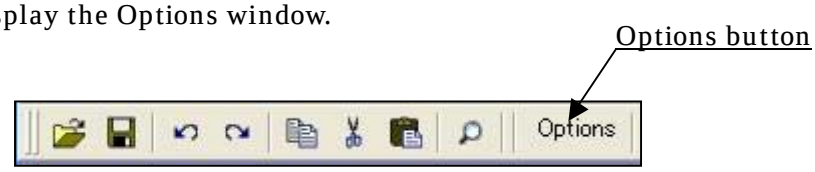
a . Select "Add Motion" from the File menu of the Time Line window to append motion data to the existing Time Line. The loaded Motion data will be appended from the Frame immediately following the last Keyframe in the Time Line. To ensure that the newly added motion is integrated into the original motion, an automatic adjustment will be performed to link the two motions. The body part that the adjustment is based on is set up using the "Base Part at Motion Add" function.

4. Importing RSF Files

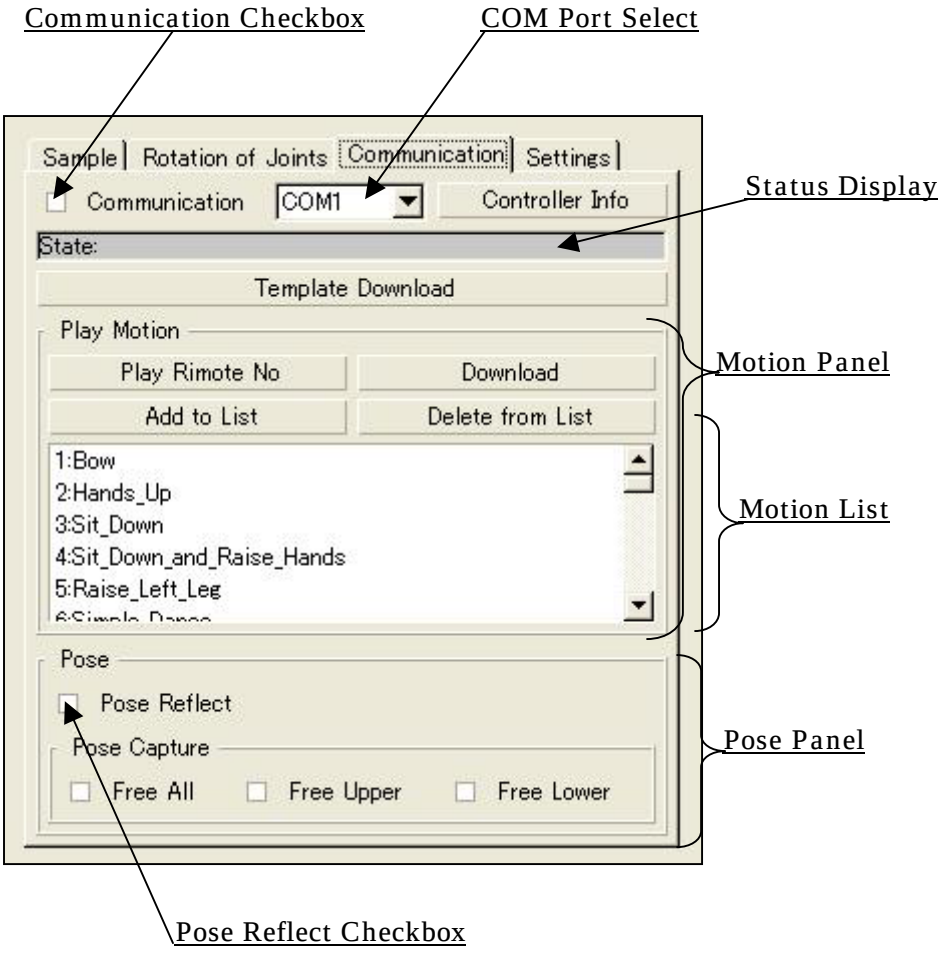
a . Select "Import RSF" from the File menu of the Time Line window, and the file selection dialog box will be displayed. Select a file with an ".rsf" extension to load, and click OK to REPLACE the current project's Time Line with the file's content.

< ROBOT Communication >

ROBOT Communication is mainly operated via the "Communication" tab of the Options window (illustrated below). **Click the Options button** in the Time Line window to display the Options window.



[Communication Tab]



1. Beginning ROBOT Communication

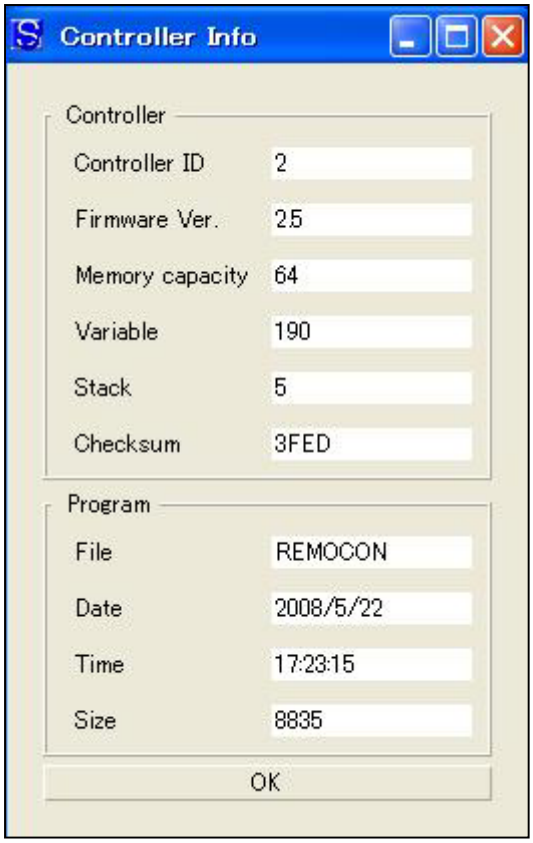
a. Select the COM port to use from the "COM Port Select" menu of the Communication tab.

b. Check the "Communication checkbox" in the "Communication" tab to begin communications with the robot. During transmission, the transmission status will be displayed in the "Status Display".

* Functions 2 through 8 below (except 4) are only effective while ROBOT Transmit is in progress.

2. Acquiring Robot Controller Information

a. When SimROBOT begins transmission with your robot, it first acquires information of the robot's built-in controller. While transmission is in progress, click Controller Info. The acquired controller information will be displayed.



Controller Information

3. Downloading the Template

a . **Click the Template Download button in the Communication tab to download the robot's default template motion. See the Template Motion List for further information on template motions.**

*** Please note that downloading overwrites the complete motion data to the robot, and accordingly pre-existing data will be deleted.**

4. Appending/Deleting the Motion List

a . Click the number of the motion to be set from the Motion List in the Motion panel of the Communication tab. The selected list item will be displayed in blue.

b . Click "Add to List" in the Motion panel of the Communication tab. The input name dialog box will be displayed.

c . Enter a name for the motion and click "OK". The motion in the current Time Line will be added to the list.

d . Click the number of the motion to be deleted from the Motion List in the Motion panel of the Communication tab. The selected list item will be displayed in blue.

e . Click "Delete from List" in the Motion panel of the Communication tab. The selected motion will be deleted.

5. Transferring Motions from SimROBOT to the Robot

a . Click “Download” in the Motion panel of the Communication tab. All motions in the list will be downloaded to the robot. During the download, the robot will become limp, so be sure to support it in accordance with the messages displayed.

* Please note that downloading (including synchronized playback and template motions) overwrites the complete motion data to the robot, and accordingly pre-existing data will be deleted.

6. Playback Robot Motion

a . Click the motion to be played from the Motion List in the Motion panel of the Communication tab. The selected list will be displayed in blue.

b . Click "Play Rimote No." in the Motion panel of the Communication tab. The selected motion will be played back. The remote control supplied with your ROBOT can also be used in the same way. See Remote Control Button Mapping for details.

* When performing playback with Pose Reflect set to ON, the motion data within the Time Line is downloaded to button 32. If you wish to use button 32, do not playback motion with Pose Reflect set to ON once the data is downloaded.

7. Synchronizing SimROBOT and Robot

a . While SimROBOT communication is in progress, check the Pose Reflect checkbox in the Pose panel to allow the robot's pose to reflect on-screen poses as they are decided. See the actual robot performing the poses to aid your creativity.

b . With communication in progress and the Pose Reflect checkbox checked, press the red Play button in the Time Line window, and the robot will move in accordance with the SimROBOT motion. Use this function before downloading motion data to the robot or synchronizing movement to an AV file. (When playing back motion, the data will be temporarily downloaded to the robot beforehand).

During Pose Reflect, the robot will reflect in real time the actions displayed in the 3Dview. As you pose the robot in 3Dview, the real robot will move accordingly.

*** Please note that downloading overwrites the complete motion data to the robot, and accordingly pre-existing data will be deleted.**

8. Pose Capture

a . Check the "Free All" checkbox in the 「Pose Capture」 sub-section of the Pose panel of the Communication tab. Every joint of the robot will become limp, and all movements will be reflected in the 3Dview window in real time. Keep in mind that Keyframes are not automatically set, so be sure to set changes in the Time Line.

b . Once you have set the pose, uncheck the 「Pose Capture」 checkbox in the Pose panel of the Communication tab. 「Pose Capture」 will now end.

c . In addition to "Free All", "Free Upper" and "Free Lower" can be selected, which will enable you to 「Pose Capture」 just the upper body or lower body depending on preference. Controls and disconnect procedures are the same as for "Free All".

< AV File/Media Window Controls >

With SimROBOT, you can synchronize AV files containing sound and video to motion for playback and display.

[Loading/Removing AV Files]

1. Loading AV Files

a . Select "Open AV File" from the File menu of the Time Line window to display the file selection dialog box. Select a file and click "OK" to load the file contents. Only one AV file can be loaded, and if an AV file is already loaded it will be replaced.

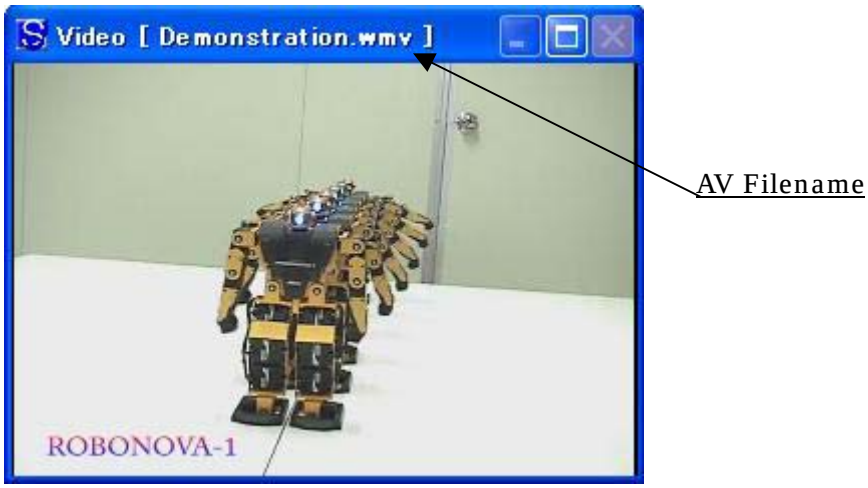
2. Removing AV Files

a . Select "Remove AV File" from the File menu of the Time Line window to remove the loaded AV file.

[Video Window Controls]

1. Displaying Video

a . Check the Video Window checkbox in the View menu of the Time Line window, and the Video window will be displayed as illustrated below. Uncheck the Video Window checkbox and the window will be hidden.



2. Media Window Controls

a . Double-click within the Video window, or press the Maximize button to the upper right of the window to display the video in full screen mode.

b . During full-screen video, double click the video display or press the "Esc" key to return to windowed mode.

c . As with other windows, the mouse can be used to move/expand/reduce the window, but cannot close it directly.

[Synchronized AV Display]

1. Synchronized AV Playback

a . Once an AV file has been loaded, pressing the Play button in the Time Line window will play the motion together with the AV file. The AV content will play in the Media window.

2. AV Current Frame Display

a . Once an AV file has been loaded, move the Current Frame bar to another point and the Media window will display the video frame associated with that point.

* "AV File Synchro Start" and "AV File Current Frame" can only support a Range of up to 15 seconds on the Time Line. Ranges longer than this are not supported.

< Collective Editing of Poses >

[Motion Mode]

With regular pose editing (Posing), each pose is edited a single Keyframe at a time. In Motion mode however, all of the Keyframes within the Playback Range can be edited at once.

1. Switching to Motion Mode

a . Click the Motion Mode icon at the bottom of the Time Line window. The icon will change color, and Motion Mode will be set to ON.

 Motion Mode OFF

 Motion Mode ON

2. Full Body Posing

a . If you drag the body in Motion mode, it will be moved the same distance and direction in all Keyframes within the Playback Range. While in Motion mode, only the entire body may be dragged.

b . If you click the Ground icon at the bottom of the 3Dview window, the robot will contact the surface in all Keyframes within the Playback Range.

c . If you select "Foot Land" in the Joint menu during Motion Mode, the robot will be repositioned so that one or both feet are flat on the surface in all Keyframes within the Playback Range.

d . If you select "Adjust Prev Key" in the Joint menu during Motion Mode, then the robot will be repositioned so that the selected joint in the selected Keyframe lines up with the Keyframe immediately prior to the first Keyframe of the Playback Range. The robots in all other Keyframes within the Playback Range will also be repositioned by the same amount.

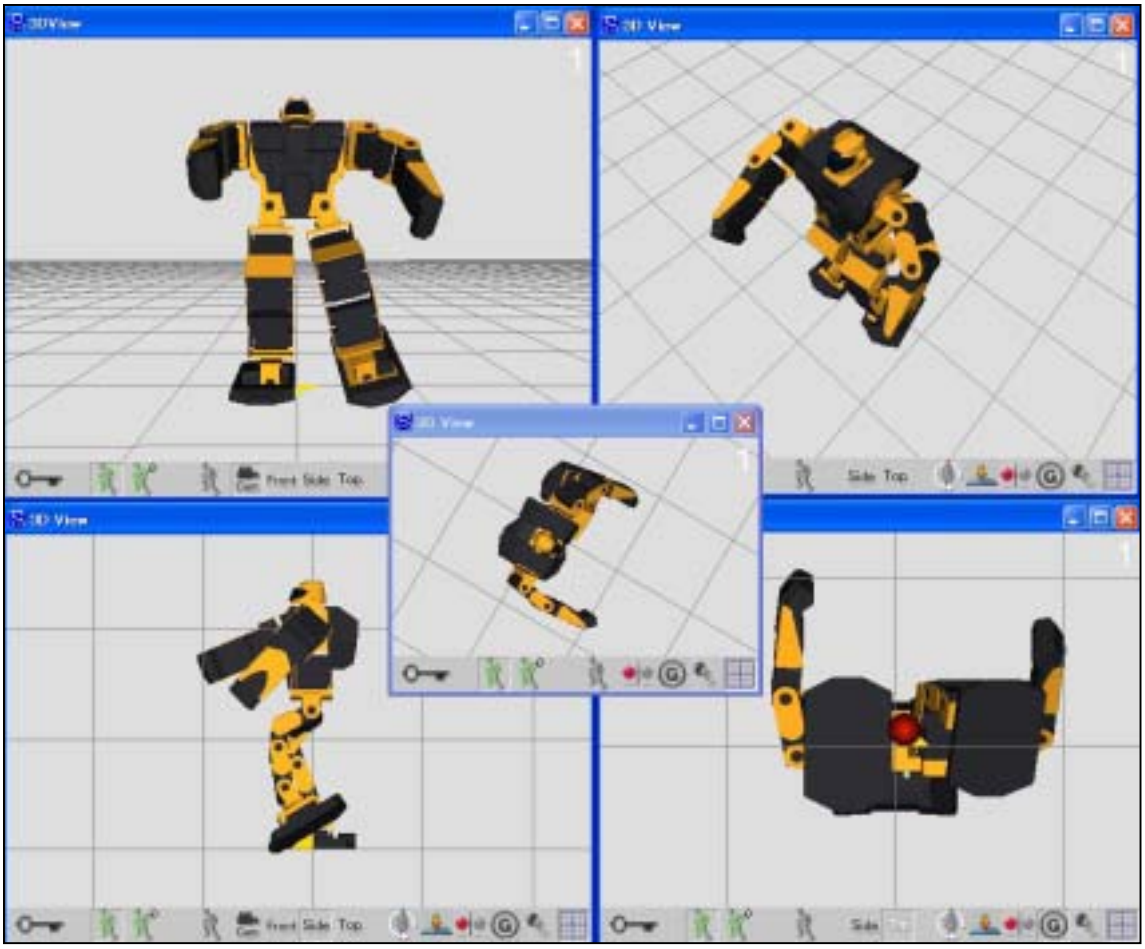
< Other Functions >

[Multiple 3DView Displays]

SimROBOT allows you to open multiple 3Dview windows which enable you to simultaneously check a number of different angles of your robot's pose.

1. New 3D View

a . Select "New 3D View" from the View menu of the Time Line window. A new 3Dview window will be displayed. Each 3Dview window can be set to display a different angle. There's no technical limit to how many 3Dview windows you can open, but the more you have open the greater the processing load and the slower response time will be.

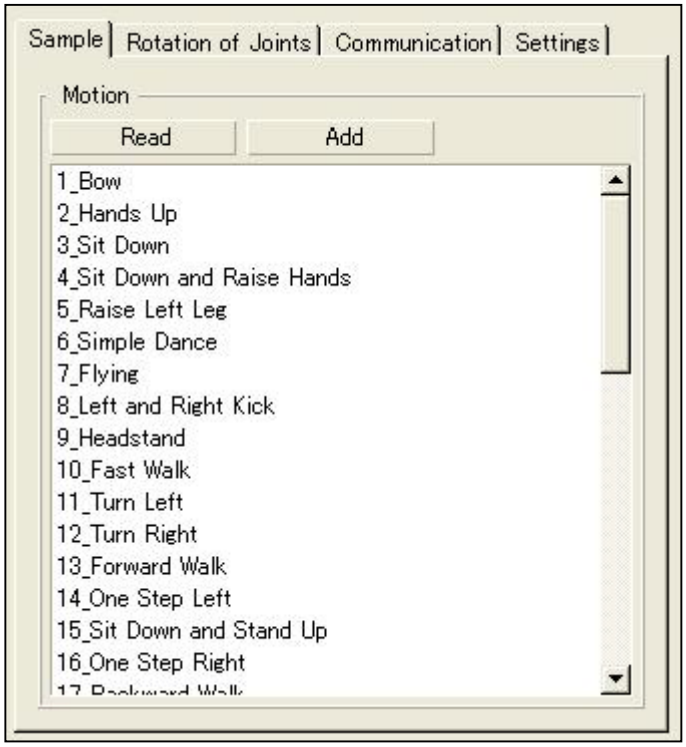


[Samples]

1. Loading Sample Motions

SimROBOT comes with a number a premade sample Motions which can be loaded and added.

a . Select the Motion to load from the Motion List in the Motion panel of the Sample tab of the Options window. The selected Motion will be displayed in blue. When you click "Read", the current Time Line will be REPLACED with the selected Motion.



Sample Tab

2. Adding Sample Motions

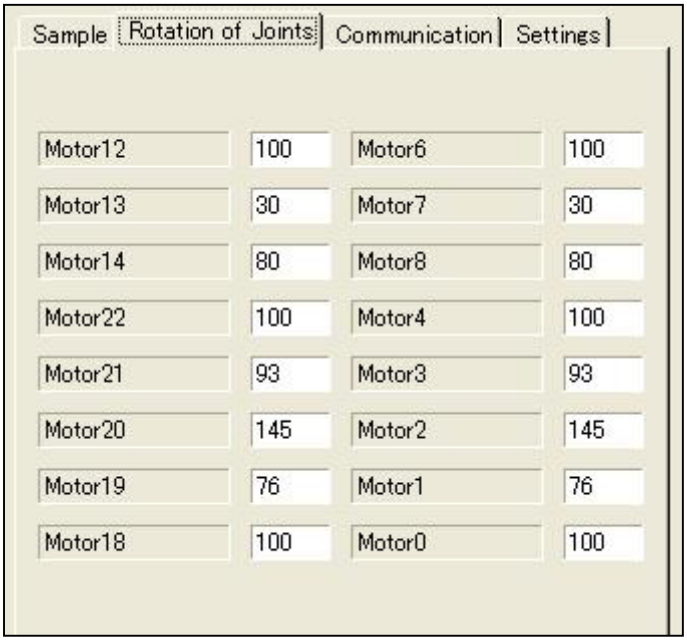
a . Select the Motion to load from the Motion List in the Motion panel of the Sample tab of the Options window. The selected Motion will be displayed in blue. Click the "Add" button and the selected Motion will be added to the end of the current Time Line. To ensure that the newly added motion is integrated to its original motion, an automatic adjustment will be performed to link the two motions. The body part that the adjustment is based on is set up using the Base Part at Motion Add function.

* The Collision function will also show collisions in some of the sample motions. Take extra care when downloading such motions to the ROBOT.

[Rotation of Joints]

1. Rotation of Joints

SimROBOT allows the rotation of each joint to be edited directly by entering a numeric value.



Rotation of Joints Tab

a . Add numerical values to each joint in the "Rotation of Joints" tab (Options window) and the result will be reflected directly in the 3Dview window. Alternatively, directly editing the pose from within the 3Dview window will be reflected in real time in the "Rotation of Joints" tab.

2. Editing Joint Name

SimROBOT allows you to edit the names of each joint of your robot.

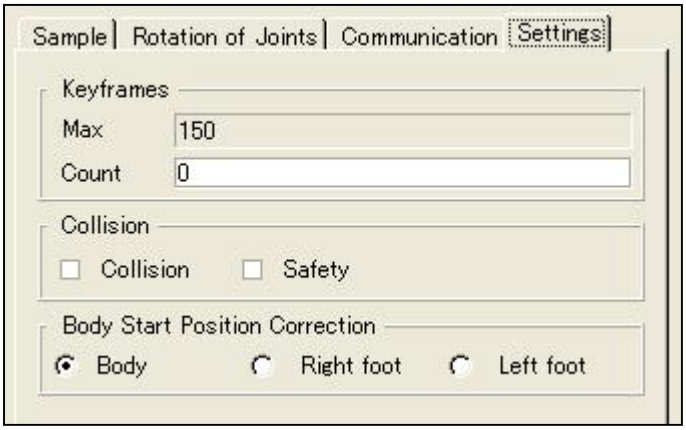
a . At the "Rotation of Joints" Tab of the Options window, you are able to directly edit the names of each joint. Changes are automatically saved and will continue to be used the next time you start up. The default names are MOTORXX where XX is the number assigned to the motor.

[Collision]

SimROBOT checks to ensure that the various parts do not collide as the robot changes poses.

1. Setting Collision Detection ON/OFF

a . Check the Collision checkbox in the Settings tab of the Options window to enable Collision detection. Uncheck the box to disable the function.

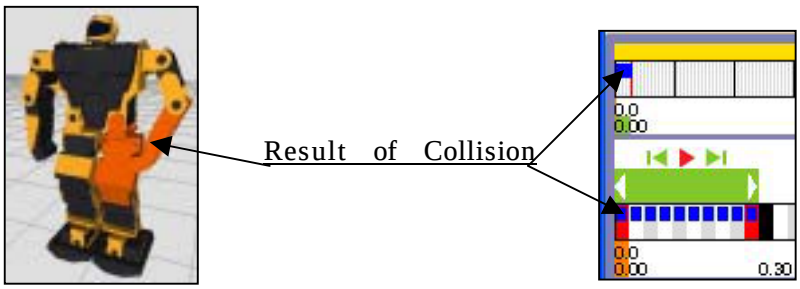


Settings Tab

2. Displaying Results of Collision Detection

a . When Collision is set to ON, colliding parts are highlighted red in the 3Dview window. The relevant Frame in the Time Line (normally the Current Frame) will have a blue indicator mark applied.

b . When Collision is set to ON, colliding parts are also highlighted red in the 3Dview window during motion playback. The blue indicator mark will be shown in the relevant Frames of the Time Line.



* Collision detection is based on estimates, and cannot guarantee 100% accuracy.

* The Collision function will also show collisions in some of the Sample Motions. Take extra care when downloading such motions to the ROBOT.

3. Safety

a . Check the Safety checkbox in the Settings tab to set Collision detection and safety to ON. If you uncheck the checkbox, only Safety will be set to OFF.

b . When Safety is set to ON, poses which contain parts highlighted red in the 3DView window indicating collision will not be sent to the robot, even when Pose Reflect is set to ON. This is to prevent the robot from attempting impossible poses. For poses such as crouching where the Collision is slight, set Safety to OFF before proceeding.

[Body Start Position Correction]

When the "Add" (Sample Motions) function is used, or the user adds their own saved Motion to the Time Line, position correction will be applied at the insertion point to ensure that the robot starts the newly added motion from the same position it finished the last. The body part that position correction is based on is set here.

1. Body Start Position Correction

a . To set the “Body start Position Correction”, choose a body part from the “Body Start Position Correction” panel of the Settings tab (Options window).

[Ghost]

1. Displaying Ghost

SimROBOT allows you to display a transparent image of the next/previous Keyframes as a reference when Posing. This transparent display is referred to as a Ghost.

a . **Click the Ghost icon at the bottom of the Time Line window to toggle the Ghost display ON/OFF. The Ghost display is OFF by default.**

Ghost Icon

[Grid]

1. Displaying Grid

In SimROBOT, a simulated ground surface is displayed as a lattice. This lattice display is referred to as a Grid.

a . **Click the Grid icon at the bottom of the Time Line window to toggle the Grid display ON/OFF. The Grid display is ON by default.**

Grid Icon

[Help]

1. Manual

a . **Select "Manual" in the Help menu of the Time Line window. "SimROBOT0 for ROBONOVA-1 Operation Manual" (this manual) will be displayed. The contents page directly links to the relevant sections for quick reference.**

2. Version Information

a . **Select "Version" in the Help menu of the Time Line window. The version information of the installed software will be displayed.** (*The version displayed below may differ from the users version.)

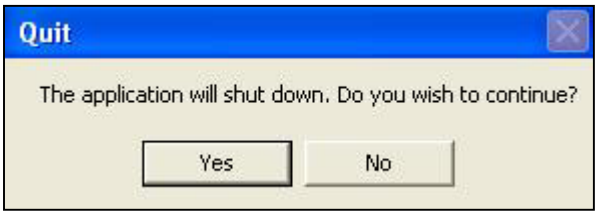
Version Information

[Quit]

1. Quitting SimROBOT

a . Select "Quit" in the File menu of the Time Line window. The confirm quit dialog box will be displayed. Click "Yes" and SimROBOT will shut down.

b . Click the Close button of the Time Line window. The confirm quit dialog box will be displayed. Click "Yes" and SimROBOT will shut down.



Confirm Quit Dialog

c . SimROBOT Assistant button

Click the Assistant button at the far right of the Time Line window. SimROBOT will shut down, and the Assistant will be launched.

Assistant Button

< Command List >

[Shortcut List]

Screen		Keyboard			Result
Time Line	3DView	Shift	Ctrl	Key	
○			○	D	Delete all Keyframes within Playback Range.
○			○	Y	Copy all Keyframes within Playback Range after current Frame.
○			○	Z	Undo Frame command.
○			○	R	Redo Frame command.
○			○	A	Set Play Range to all Keyframes.
○			○	C	Copy current Frame.
○			○	X	Cut current Frame.
○			○	V	Paste into current Frame.
○				PageUp	Scroll Wide Area Time Line 1 screen forward.
○				PageDown	Scroll Wide Area Time Line 1 screen backward.
○				Home	Scroll Wide Area Time Line to first Frame.
○				End	Scroll Wide Area Time Line to last Keyframe.
○	○			Space	Set Keyframe.
○	○			Enter	Playback Motion.
○	○			←→	Move current Frame to previous/next Frame.
	○		○	Z	Undo Pose command.
	○		○	R	Redo Pose command.
	○		○	F	World Flip.
	○			F	Local Flip.
	○			L	Touch Ground. (Foot Land)
	○			K	Toggle FK/IK Modes.
	○			H	Reset Pose to default.

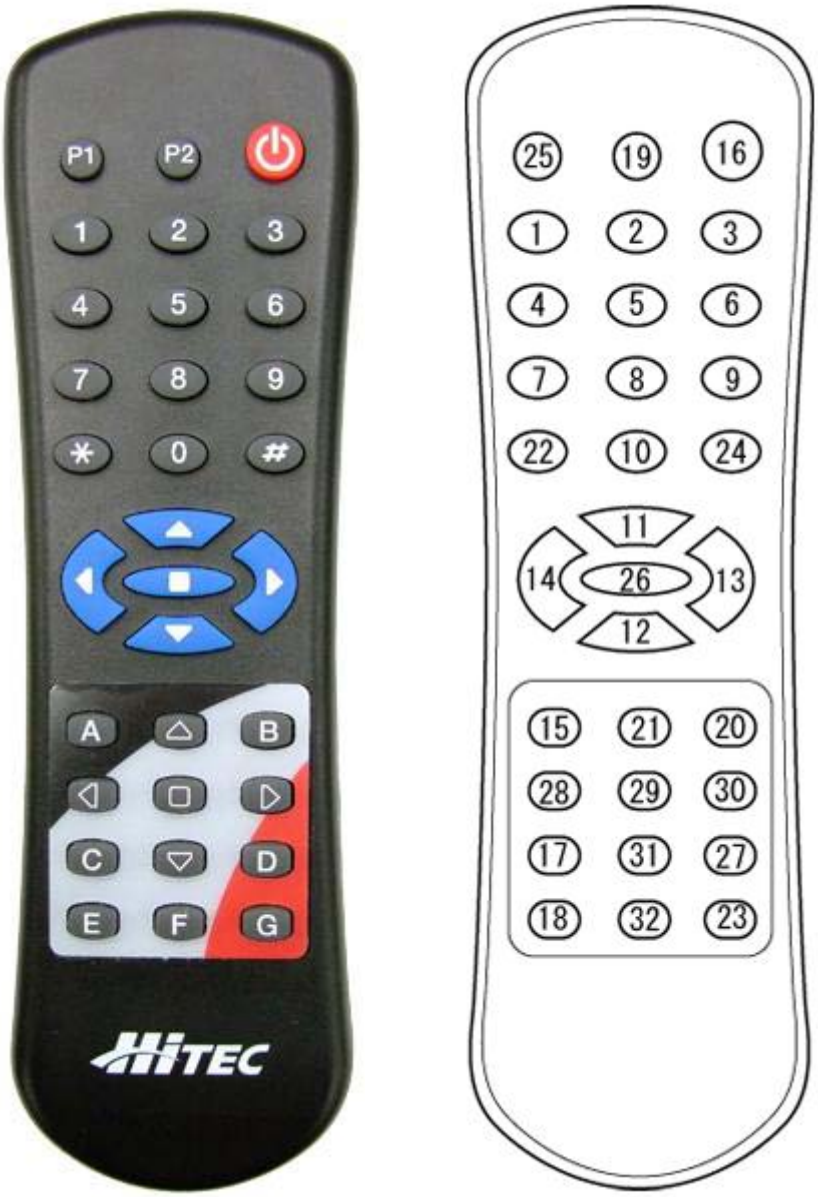
[3Dview Window Command List]

Screen		Keyboard		Mouse	Result
Time Line	3DView	Shift	Ctrl		
	○			Left-drag	Change angle and position of every part (except body).
	○			Left-drag	Move position of entire robot body (IK).
	○			Left-drag	Change angle of entire robot body (FK).
	○			Left-drag	Move viewpoint horizontally and vertically (drag away from robot).
	○	○		Left + right-drag	Zoom in/out.
	○	○		Middle-drag	Zoom in/out.
	○			Middle-drag	Move viewpoint horizontally and vertically.
	○			Right-drag	Change viewpoint angle.
	○			Right-click	Open Joint menu for selected part.
○	○			ホイール	Move current Frame to previous/next Frame.
	○			Left W-click	Center and resize robot to fill window.

[Time Line Window Command List]

Position of Mouse Pointer	Keyboard		Mouse	Result
	Shift	Ctrl		
Scroll bar			Right-drag	Move scroll bar (scroll)
Scroll bar line			Middle-click	Move scroll bar (direct)
White triangle in Playback bar			Left-drag	Move to either extreme of playback area.
Playback bar			Left-drag	Move playback range.
Playback bar			Middle-drag	Set new playback range.
Playback bar			Left W-click	Set Play Range to all Keyframes.
Keyframe			Left-drag	Move Keyframe.
Keyframe			Left-drag	Drag into Trash Can above to delete.
Keyframe			Right-drag	Move all Keyframes in move direction together.
Keyframe	○		Right-drag	Move all Keyframes in opposite direction together.
Wide Area Time Line			Left-drag	Scroll Wide Area Time Line (drag part other than Keyframe).
Working Time Line			Left-drag	Scroll Working Time Line (drag part other than Keyframe).
Current Frame bar			Left-drag	Move current Frame.
Play button			Left-click	Playback Motion.
To Start button			Left-click	Move current Frame to beginning of selected Range.
To End button			Left-click	Move current Frame to end of selected Range.
(Anywhere)			Wheel	Move current Frame to previous/next Frame.

< Remote Control Button Mapping >



< Template Motion List >

Button	Motion	No
	ON : motor on → Basic Position ／ OFF : Sitting Position → motor off	16
P1	Rise from lie on face	25
P2	Rise from lie on back	19
1	Bow → Basic Position	1
2	Raise arms → Basic Position	2
3	Sit → Basic Position	3
4	Sit → Raise arms → Basic Position	4
5	Raise a leg → Basic Position	5
6	Spread the legs → Extend arms → Right-left tilt → Basic Position	6
7	Flap arms like a bird	7
8	Kick	8
9	Headstand	9
0	Walk fast	10
∗	Left turnabout	22
#	Right turnabout	24
	Forward	11
	Reverse	12
	Right move	13
	Left move	14
	Sit ←→ Stand up	26
A	Left attack	15
B	Right attack	20
C	Lower left Attack	17
D	Lower right Attack	27
E	Bon Festival Dance	18
F	T'ai chi chuan dance	32
G	Push-up	23
	Front tumbling	21
	Rear tumbling	31
	Left cartwheel	28
	Right cartwheel	30
	Forward punch	29