Chapter 4: Store system programming

ControlSpace Designer software allows you to set up signal processing associations, and configurations to meet the unique needs of your project. For example, a restaurant may need three different settings for breakfast, lunch, and dinner. You can store these different “scenes” and they can be recalled later.

ControlSpace Designer software provides four different methods for you to capture these settings: groups, parameter sets, presets, and timers. These windows are also known as the Control Library.

- **Groups** - The behavior of two or more similar signal processing blocks can be linked together by adding them to a group. Once they are grouped, the behavior of these functions or signal processing (SP) blocks will be synchronized. For example, you could group two gain blocks together and then control both using a master fader.
- **Parameter Sets** - Sometimes called scenes or sub-presets, parameter set are a collection of signal processing blocks and their settings. You can capture the state of one or more signal processing blocks, inputs, or outputs by adding them to a parameter set. The captured state of these blocks can then be recalled later. For example, you may want to select a CD player as a sound source, and decrease the gain to a specific level. To store a snapshot of this state, set your signal processing blocks to the proper settings (CD source selected, gain set) and drag them into a parameter set. Your settings are stored, and can be recalled at any time.
- **Presets** - Whereas parameter set are a snapshot of a part of your system, preset store the state of all devices in the entire system. They are used when you want to initialize or change the state of the entire system.
- **Timers** - Timers allow you to schedule certain events in your system to occur on a certain date, a certain time of day, or on a weekly schedule. For example, you could schedule an increase in system volume every day at 5 pm.

Groups

ControlSpace Designer software allows you to link the behavior of two or more similar signal processing blocks using groups. There are two types of groups: grouped signal processing blocks and grouped gains. When you group signal processing blocks together (such as two Parametric EQs), the settings are synchronized: changes to one block affect the others in the group. When gain controls are grouped together, they can be controlled together by a master fader. However, the gains are not synchronized; individual changes are still allowed, for example, to set different trim levels. ControlSpace Designer software can store up to 128 groups. Open the **Groups** window by choosing **Window** > **Groups**.

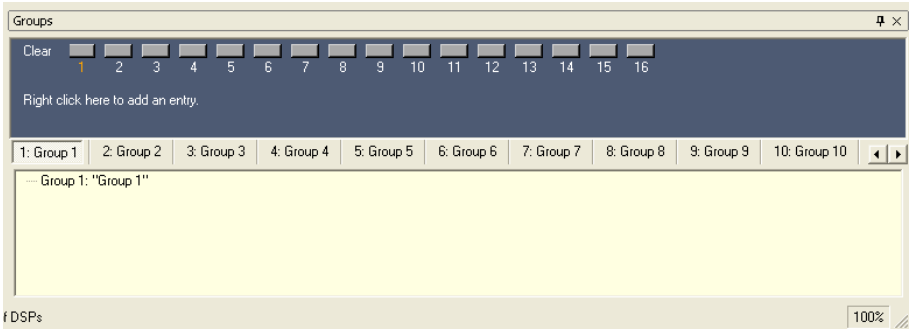

*Figure 4.1 - **Groups** window*

You can drag and drop two or more similar blocks from the **ESP-88** window to create a group. In this example we will create a group called “CD” since we do not need to independently adjust the input levels of the CD L and CD R sources. Follow these steps to group two input blocks together:

1. Select two input blocks by holding the **Ctrl** key and clicking on them, and drag them onto the “Group 1: “Group 1”” text line.

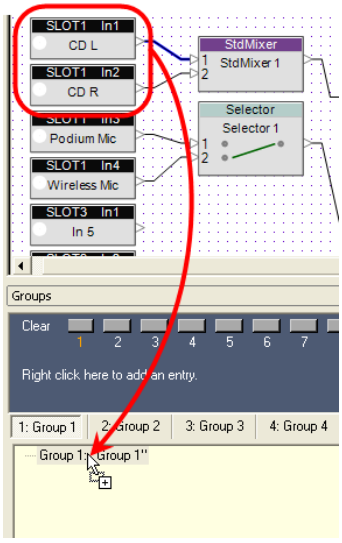

Figure 4.2 - Drag and drop into a group

In the case of input, output, and gain blocks, you are prompted to choose the properties of the block you want to group: **Level + Mute**, **Level**, or **Mute**. Choose **Level + Mute** and click **OK**. Both **Level** and **Mute** will be controlled for these inputs.

Figure 4.3 - Choose properties

2. Rename the group by selecting the group in the **Groups** window and pressing **F2**, or right click and choose **Rename**. Name the group “CD”.

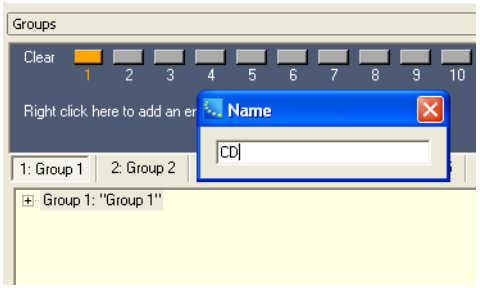

Figure 4.4 - Rename the group

3. In the **Groups** window, right click on **Group 1: “CD”**, and select **Master Fader...**.

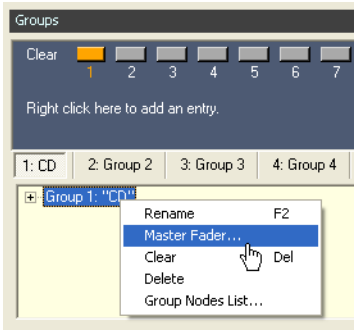

Figure 4.5 - Open the Master Fader

The Master Fader opens. Use this fader to control both of the inputs in the group.

4. To verify the correct behavior, open the Master Fader, and both input control panels. Move the slider on the Master Fader. The input sliders are controlled by the Master Fader.

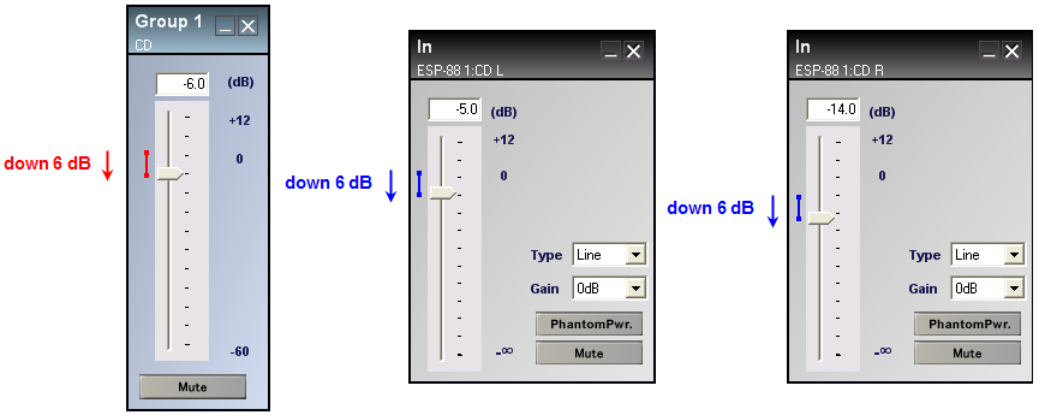

Figure 4.6 - Adjust the gain on the Master Fader to change the gain on both inputs.

Note: **The grouped faders will maintain their relative positions when adjusting the Master Fader. You can change the level of an individual group member at any time. As the Master Fader is moved, an individual gain stops when it reaches its upper or lower limit, but the other gains in the group will continue to move. When the Master Fader is moved back, the relative gains are maintained as the stopped gain comes off its upper or lower limit.**

You can view the contents of a group by expanding the tree structure for a group in the **Groups** window. The tree structure displays the devices that are included in the group and the properties that are controlled in the group.

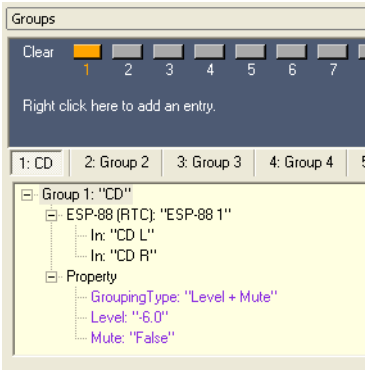

Figure 4.7 - Group tree structure

After storing a group, the **Clear** button in the **Groups** window is highlighted in orange. This indicates that a group has been stored. To clear the contents of the group, press the orange **Clear** button.

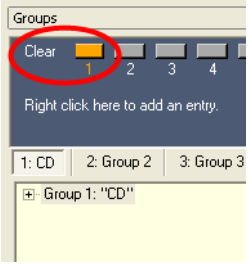

Figure 4.8 - Stored group

To add a group, right click underneath the **Clear** buttons and choose **Add Group**. The new group is added after **Group 16.**

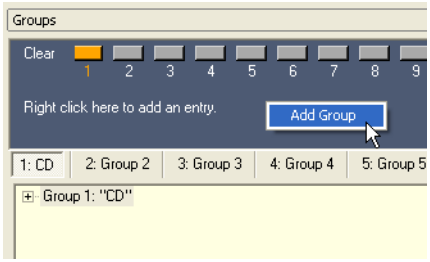

Figure 4.9 - Adding a group

Note: If you want to change which properties (Level, Mute) are controlled in a group, you must first clear the contents of the group, then re-drag the blocks into the group.

When two signal processing blocks (other than gain blocks) are grouped together, their settings are synchronized. Changes to one block automatically affect the others in the group. For example, you could group two Selector type blocks together if you want to synchronize their settings. Drag the two Selector blocks into a new group, then open both control panels. Notice that when you change the channel on one Selector block, the other Selector changes to the same channel.

Figure 4.10 - Changes to Selector 1 are mimicked in Selector 2

Besides dragging and dropping from the **ESP-88** window, the following are two additional methods by which you can add blocks to a group:

- Select one or more blocks, right click, and choose **Add To Group.**

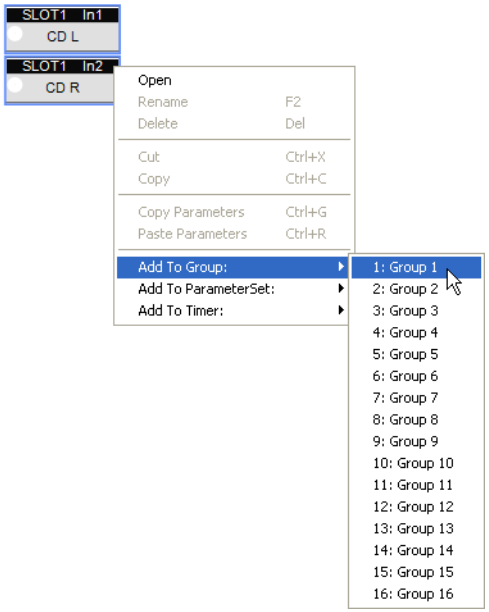

Figure 4.11 - Right click to add to a group

- Create a group using the **Group Nodes List**. Right click on the group name in the **Groups** window, and choose **Group Nodes List...**. The **Group Nodes List** window opens showing all blocks that are available for grouping.

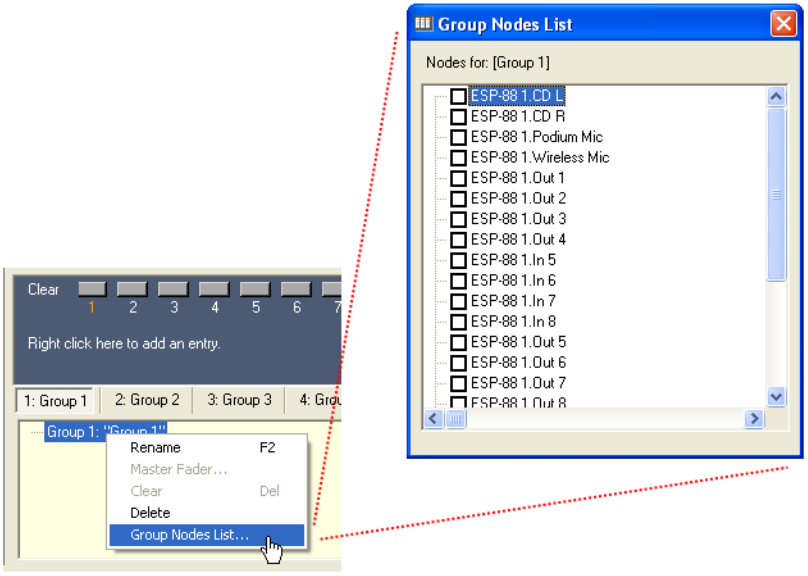

*Figure 4.12 - Open the **Group Nodes List** window*

Place a checkmark in the box next to the items you want to add to the group. Note that after you place the first checkmark, only blocks of the same type are available for grouping. Other non-compatible blocks are grayed out. In Figure 4.13 below, a gain (input) type block has been checked in the Group Nodes List. This block can only be grouped with other gain type blocks, so all non-gain type blocks are automatically grayed out.

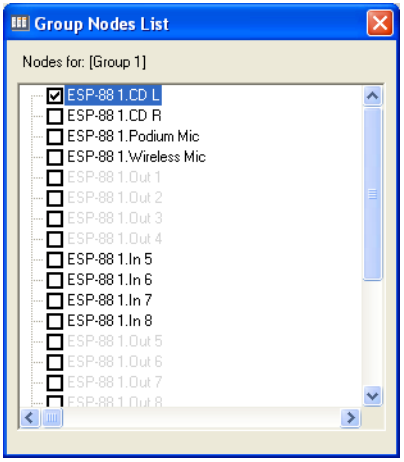

Figure 4.13 - Only blocks of the same type (in this case gain) can be grouped together

Parameter Sets

Parameter sets are a collection of signal processing block settings. A parameter set stores a snapshot of these settings which can later be recalled or invoked. Use parameter sets when you want to change the state of specific parameters without affecting the state of the entire design.

Creating parameter sets

To open the **Parameter Sets** window, choose **Window** > **Parameter Sets**.

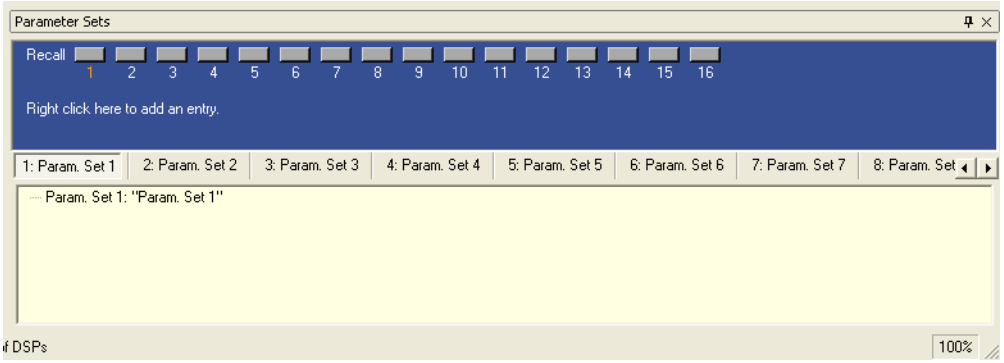

*Figure 4.14 - **Parameter Sets** window*

To create a parameter set first set the signal processing to the desired state. Then select the signal processing blocks in the **ESP-88** window whose state you want to store, and drag and drop them onto a parameter set in the **Parameter Sets** window.

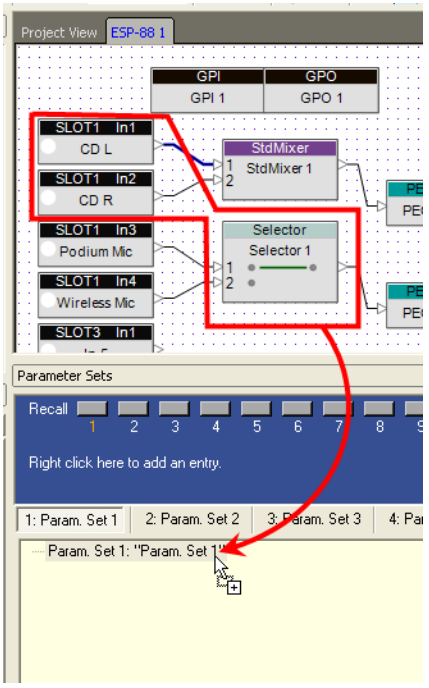

Figure 4.15 - Drag and drop blocks into the parameter set

The state of the signal processing block is now stored in the parameter set. To verify what settings are contained in a parameter set, expand the tree structure in the **Parameter Sets** window. The tree structure displays each block that is included in the parameter set, and the state of the settings for each block.

Tip: **Double-click on a name in the tree structure to open the control panel for that device or block.**

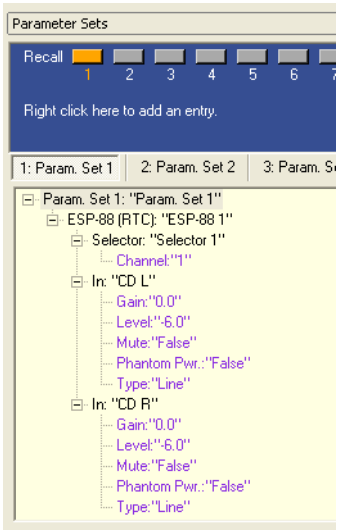

Figure 4.16 - Parameter set tree structure

To rename the parameter set, select the top level of the tree structure and press **F2**, or right click and choose **Rename**.

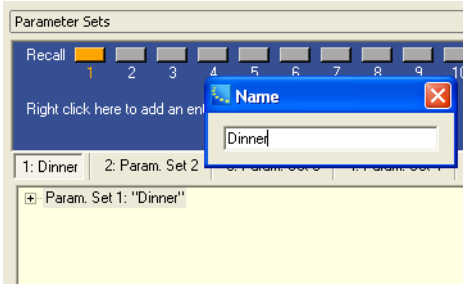

Figure 4.17 - Rename the parameter set

Another way to add blocks to a parameter set is to select one or more blocks, right click, and choose **Add To Parameter Set.**

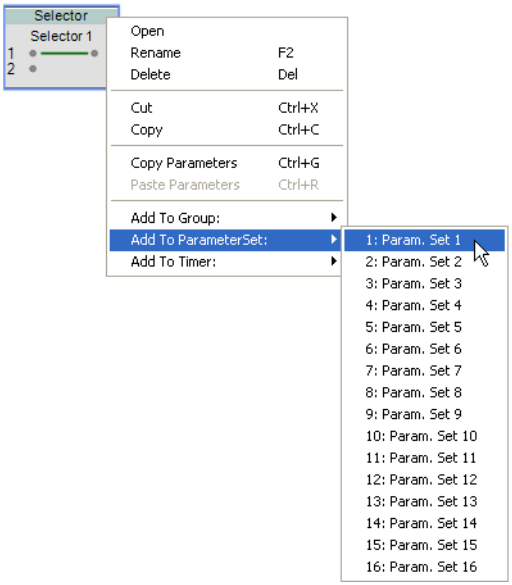

Figure 4.18 - Right click to add to a parameter set

Note: To change the value of a setting in the parameter set, first change the setting in the control panel and then re-drag the block into the parameter set. You do not need to delete the block from the parameter set.

Parameter Set Nodes List

You can also create or modify a parameter set by using the Parameter Set Nodes List. Double-click on the parameter set name in the **Parameter Sets** window, or right click and choose **Parameter Set Nodes List...**. The **Parameter Set Nodes List** window opens showing all signal processing nodes in your system.

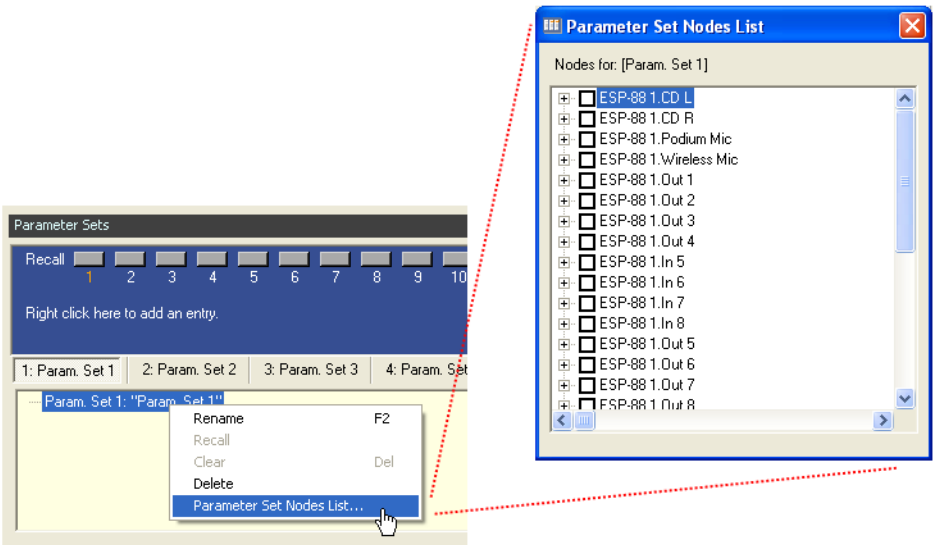

Figure 4.19 - Open the Parameter Set Nodes List

Note that you can expand most blocks to view the individual settings for the block.

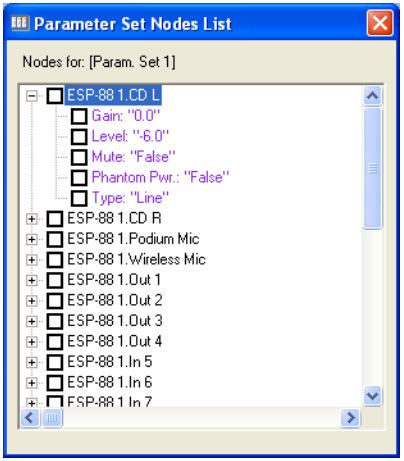

Figure 4.20 - Expand a device to see properties

If you are creating a new parameter set, you can specify exactly which settings you want to store. To store all settings for a given block, place a check mark next to the block name, as shown in Figure 4.21. Note that all the settings within the block are automatically selected.

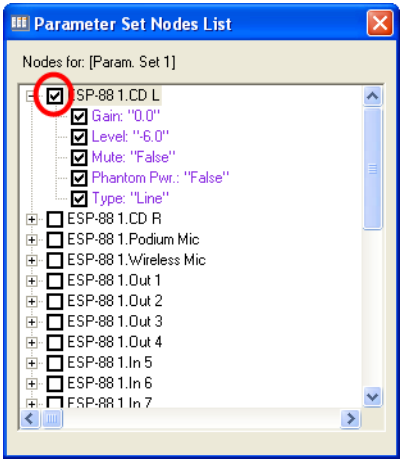

Figure 4.21 - Include all settings for the device

Storing discrete parameters

To include only specific settings in the parameter set, use the Parameter Set Nodes List and place a check mark next to the settings within the block, as shown in Figure 4.22. For example, you may want your parameter set to set the gain level of an input block, but not affect the mute status. When this parameter set is invoked, only the selected settings will be changed. The settings that are not checked are not part of the parameter set and remain unchanged when the parameter set is invoked.

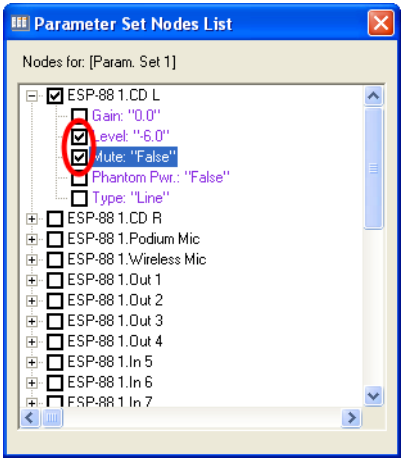

Figure 4.22 - Include only the selected settings in the parameter set

You can also use the Parameter Set Nodes List to modify an existing parameter set. Open the Parameter Set Nodes List and check or uncheck the settings that you want to include in the parameter set.

Changing values in parameter sets

If you need to change the *value* of a setting that is part of a parameter set (for example, a gain of -6 dB) you will need to change the setting in the **ESP-88** window, the re-drag the block into the parameter set. The values of parameters are displayed but cannot be changed within the **Parameter Sets** window.

Recalling parameter sets

The **Recall** buttons in the **Parameter Sets** window are change to orange when a parameter set is stored. Pressing recall changes the state of all specified signal processing blocks to the values stored in the parameter set. You can open the individual signal processing block control panels and then recall parameter sets to verify that you have stored the correct settings.

Clearing parameter sets

To clear the contents of a parameter set, right click on the top level of the tree structure, and select **Clear**, or press **Delete**.

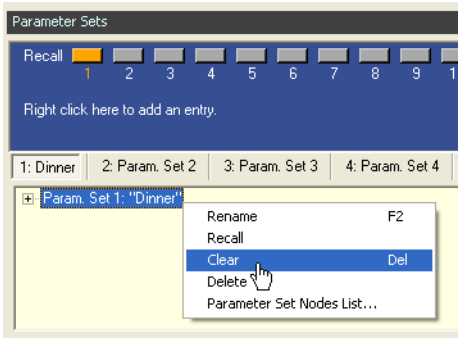

Figure 4.23 - Clear a parameter set

Presets

Presets are a snapshot of the state of the entire system including all signal processing blocks, CC-64 and CC-16 programming. Presets are also the only way to dynamically change the programming of the CC-64 and CC-16 controllers. Because presets are “global” settings, meaning they affect every setting of every device, you should only use them if you want to initialize or change the state of the entire system, or if you need to change how a CC-64 or CC-16 is programmed.

Note: Presets can only be invoked by a General Purpose Input (GPI) or a timer. Presets cannot be invoked by a CC-64 or CC-16.

Creating presets

To open the **Presets** window, go to **Window** > **Presets**.

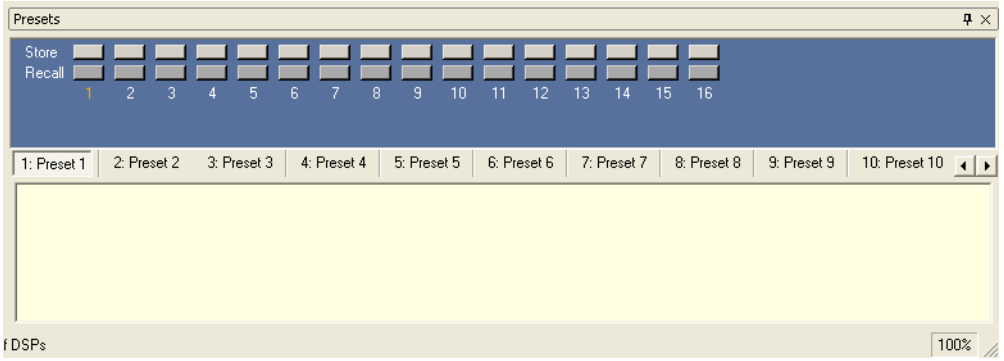

*Figure 4.24 - **Presets** window*

To store a preset, first set your system to the desired state. Then simply press the **Store** button in the **Presets** window. The preset is automatically populated with all devices and all settings in your system design. The **Store** and **Recall** buttons will turn orange to indicate that a preset has been stored. You can view all the devices and settings in a preset in the tree structure in the **Presets** window.

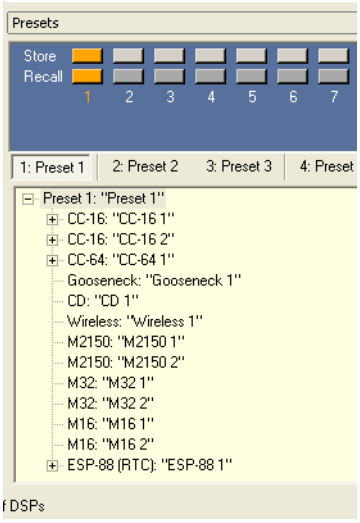

Figure 4.25 - Preset tree structure

To rename a preset, right click on the top level of the tree structure and press **F2**, or right click and choose **Rename**.

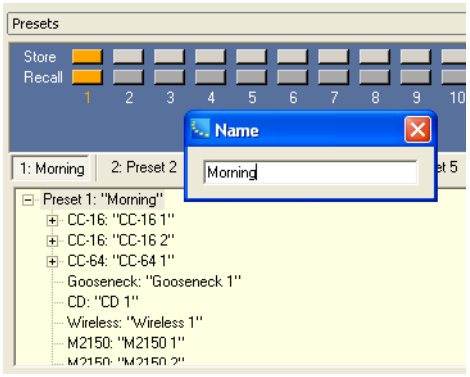

Figure 4.26 - Rename a preset

Recalling presets

To recall the system to the state that is stored in the preset, press the **Recall** button in the **Presets** window.

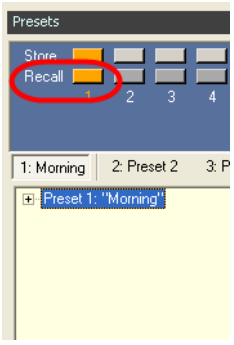

Figure 4.27 - Recall a preset

Changing presets

To change an existing preset, configure the signal processing then press the **Store** button again. You are asked whether you would like to overwrite the existing preset.

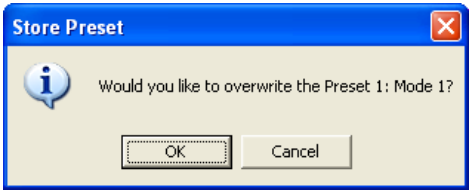

Figure 4.28 - Changing an existing preset

Clearing presets

To clear the contents of a preset, right click on the top level of the tree structure, and select **Clear**.

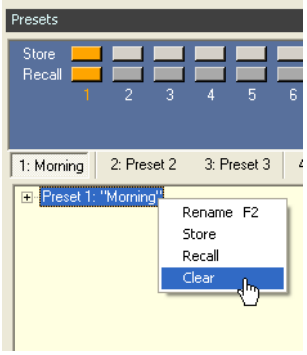

Figure 4.29 - Clear a preset

Timers

Timers allow you to schedule changes in the signal processing settings. You can schedule a change to take place on a specific date and time, at the same time every day, or at a time on specific days of the week. For example, you could schedule a change in source selector to take place every day at 5:00 pm.

Creating timers

To open the **Timers** window, go to **Window** > **Timers**.

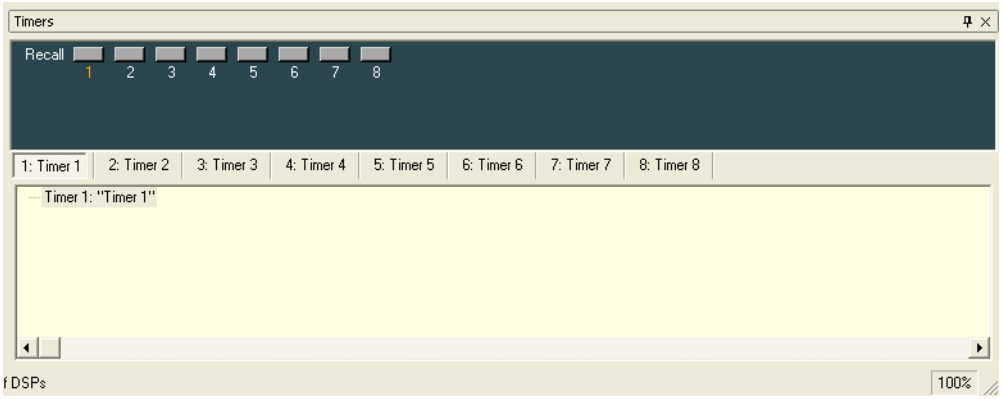

*Figure 4.30 - **Timers** window*

To store a timer, first set the appropriate blocks in the ESP-88 window to the state they will change to at the specified time. Then drag the blocks into a timer in the **Timers** window.

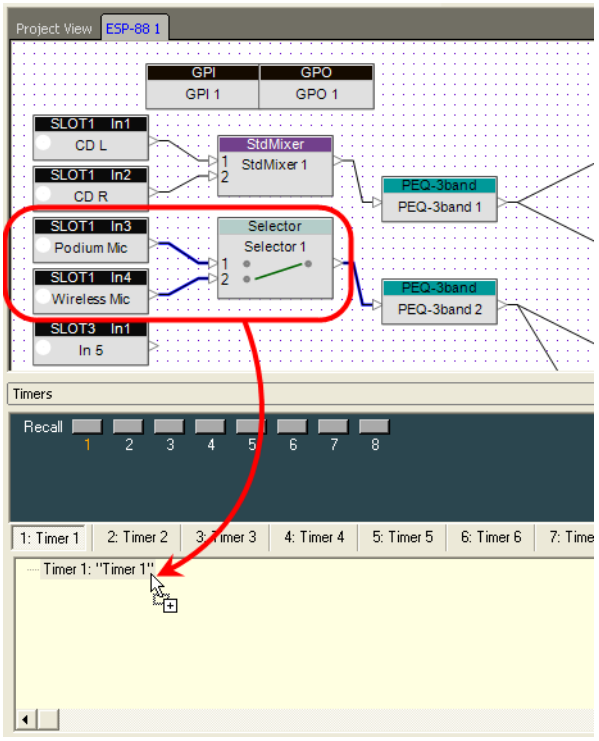

*Figure 4.31 - Drag and drop into the **Timers** window*

Timer Setup

When you first create a timer, the **Timer Setup** window opens. Use this dialog to specify the type and schedule for the timer event.

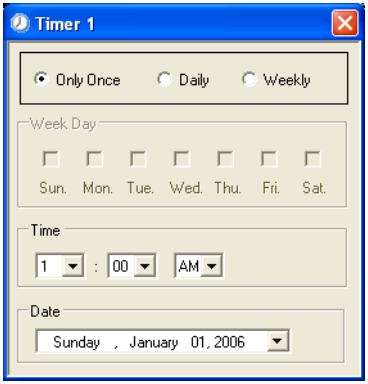

*Figure 4.32 - **Timer Setup** window*

You can program your settings to be invoked **Only Once, Daily**, or **Weekly**.

- **Only Once** - The settings will be invoked on the specified date and time.
- **Daily** - The settings will be invoked every day at the specified time.
- **Weekly** - The settings will be invoked at the specified time on the specified days of the week.

To change the setup of a stored timer, double-click on the timer in the **Timers** window, or right click and choose **Set Date Time...**. The **Timer Setup** window opens.

Another way to add blocks to a timer is to select one or more blocks, right click, and choose **Add To Timer**.

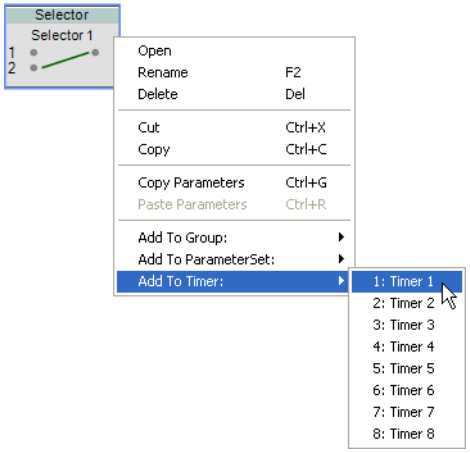

Figure 4.33 - Right click to add to a timer

You can program a timer to invoke a parameter set by dragging a parameter set from the **Parameter Sets** window to the **Timers** window. After selecting and dragging the parameter set, hold your mouse over the **Timers** window tab to bring the **Timers** window to the front. You can also hold your mouse over the timer selection buttons to automatically select a timer before dropping the parameter set into a timer (see Figure 4.34 for clarification.)

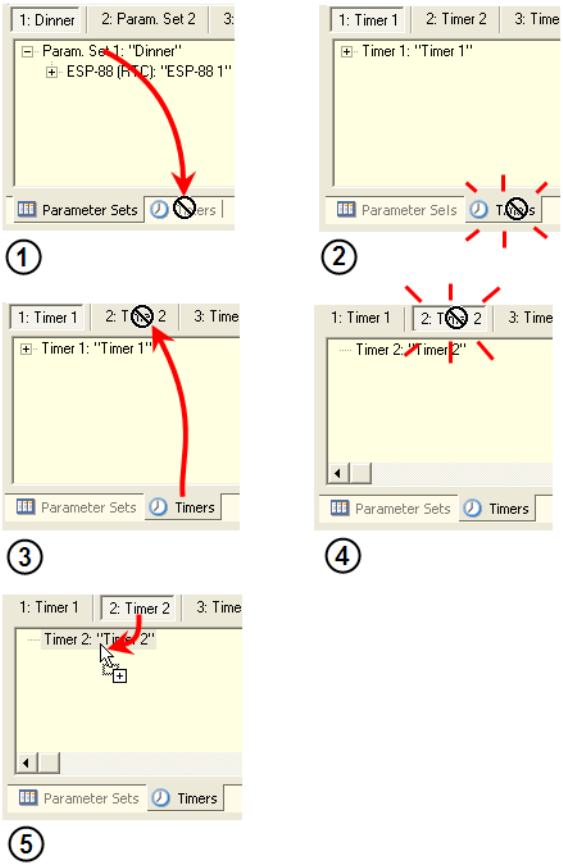

Figure 4.34 - While dragging, hover over a tab or button to bring it to the front

Recalling timers

To recall the system to the state that is stored in the timer, press the **Recall** button in the **Timers** window.

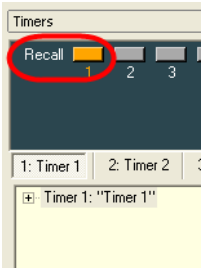

Figure 4.35 - Recall a timer

Clearing timers

To clear the contents of a timer, right click on the top level of the tree structure, and select **Clear**.

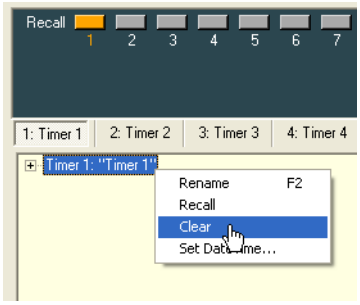

Figure 4.36 - Clear a timer

Note: **The main ESP-88 in your system acts as the Real Time Clock (RTC) which triggers timers. The RTC is automatically set to the time, date, and time zone of your computer. Always be sure to set your computer to the local time and time zone if using timers.**

Using the Project Directory

You can also create system programming using the **Project Directory** window. The **Project Directory** window contains all objects in your system design in a tree structure format. To open the **Project Directory** window, go to **Window** > **Project Directory**.

*Figure 4.37 - **Project Directory** window*

The **Project Directory** window is a master directory of your system design. All devices, signal processing blocks, inputs, outputs and programming functions can be found here. You can program groups, parameter sets, and timers by dragging and dropping signal processing blocks into the **Project Directory** window. For example, to program a parameter set, select the signal processing blocks and drag them into the parameter set tree structure.

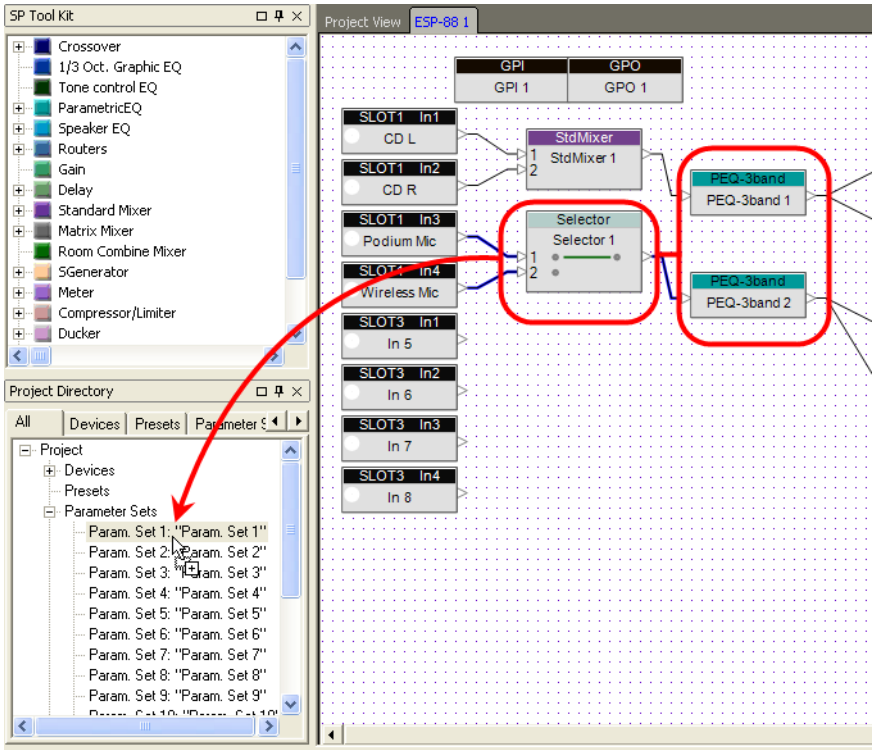

Figure 4.38 - Drag and drop into the Project directory to program a parameter set

Use the tabs at the top of the **Project Directory** window to select a sub category of objects in your design.

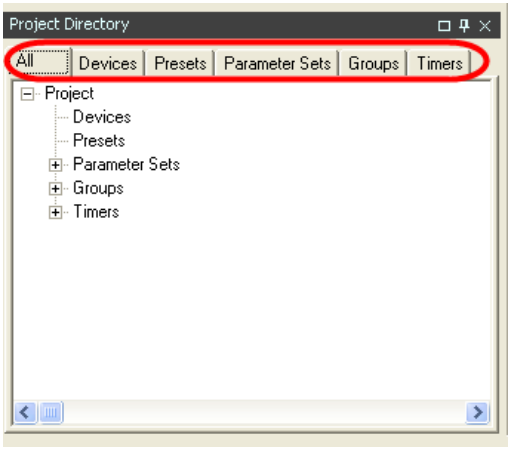

Figure 4.39 - Tabs in the Project Directory