



I/O Setup Primer

Version 9.0

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contents

Changes to I/O Setup in Pro Tools 9.0	1
Configuring I/O Setup	3
Customizing I/O Settings	5
Input and Output Signal Routing Overview	7
Pro Tools Signal Paths	10
Assigning Paths to Hardware I/O	17
Configuring Busses	18
Valid Paths and Requirements	21
Factory I/O Settings	22
I/O Settings Files	22
Session Interchange	24

I/O Setup Primer

This *I/O Setup Primer* is designed to help you understand how to configure and use the I/O Setup for your Pro Tools system. Whether you are new to Pro Tools or a long-time Pro Tools user, read through this document to gain a clear understanding of the I/O Setup, and how to best configure the I/O Setup to make sharing sessions between systems easier.



For more information on the IO Setup, see the Pro Tools Reference Guide.

Changes to I/O Setup in Pro Tools 9.0



If you are updating from Pro Tools 8.0.4 or lower to Pro Tools 8.1 or higher, review this section to understand what has changed in I/O Setup. If you are new to Pro Tools, you might want to skip ahead to “IConfiguring I/O Setup” on page 3.

Pro Tools 9.0 provides I/O Setup improvements—originally introduced in Pro Tools HD 8.1—for all Pro Tools systems. You can now choose to maintain your custom I/O settings when opening a session from another system (see “System Settings vs. Session Settings” on page 1). When opening the session, Pro Tools can automatically remap output busses to output paths, saving you from having to manually reconfigure the session’s I/O settings (see “Session Interchange” on page 24).

Additional changes to the I/O Setup include the addition of output busses to the Bus page, the ability to create overlapping output paths, and changes to how I/O settings are imported.

System Settings vs. Session Settings

In Pro Tools 9.0, I/O settings (Input, Output, Insert, Mic Preamps, and H/W Insert Delay settings) are *system* settings. These settings are stored with the system *and* the session file, and they can be recalled from either. When opening a session created or edited on another system, you can choose whether or not the I/O settings stored with the session overwrite I/O settings stored with your system.



See “Sessions Overwrite Current I/O Setup When Opened” on page 5.

Use this feature along with customized I/O settings to improve workflows when exchanging sessions between Pro Tools systems.





See “Session Interchange” on page 24.

In Pro Tools 8.0.4 and lower, I/O settings are *session* settings. They are stored and recalled from the session. When opening a session created or edited on another system, any studio settings configured for your system are overwritten by the settings stored with the session file.

Output Busses


In addition to internal mix busses, Pro Tools 9.0 and higher provide output busses, which appear along with internal busses on the Bus page of the I/O Setup. Output busses are routed (*mapped*) to output paths, as configured on the Output page of the I/O Setup. Output paths are then assigned to the system's physical audio outputs in the I/O Setups Grid. Mapped output busses are automatically created when a new output path is created.

 See “Output Busses” on page 19 for more information.

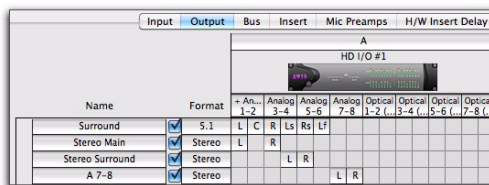
 For a graphic representation of how mapped output busses work, see Figure 2 on page 9.

Overlapping Output Paths

In Pro Tools 9.0, you can create overlapping output paths—multiple paths that can share the same physical output assignments. This can be especially useful if you are working with multiple monitoring configurations of different channel widths.


 In Pro Tools 8.1 and higher, you cannot create output sub-paths. Use overlapping output paths as you used output sub-paths in Pro Tools 8.0.4 or lower.


For example, you may want to switch monitoring between discrete surround (such as 5.1) and basic stereo, but without having to have two completely different sets of monitors. To be able to switch between the two, you can create a 5.1 output path that is assigned to output channels 1–6 (L, C, R, Ls, Rs, LFE) and also have a stereo output path that is assigned to output channels 1 and 3 (L, R).



Overlapping output paths


Overlapping output paths must overlap completely. For example, you can have a 5.1 path assigned to channels 1–6 and a stereo path assigned to channels 1 and 3 because the stereo path is “contained” by the 5.1 path. As another example, you can have two separate stereo paths assigned to channels 1–2, but you cannot have one stereo path assigned to channels 1–2 and the other assigned to 2–3 since they only partially overlap.

 With overlapping output paths of different channel widths, if the widest path is made inactive, all other overlapped output paths will not pass audio from Pro Tools.

 See “Opening Older Sessions in Pro Tools 8.1 and Higher” on page 25 for information on managing overlapping paths when exchanging sessions between Pro Tools systems.

Importing I/O Settings


In Pro Tools 9.0, you can choose to either import the settings for only the currently viewed page of the I/O Setup, or import settings for all pages of the I/O Setup.

 See “Importing I/O Settings” on page 23 for more information.

Configuring I/O Setup

I/O Setup provides a graphical representation of the signal routing for physical inputs and outputs, internal mix bussing, output bussing, and hardware inserts.

Using the I/O Setup, you can create, edit, and delete Pro Tools input, output, insert, and bus *signal paths* (see “Pro Tools Signal Paths” on page 10 for more information). You can also change how physical inputs and outputs are routed to Pro Tools inputs and outputs. The I/O Setup dialog also provides important audition, meter, and surround monitoring settings.


 See the *Pro Tools Reference Guide* for detailed information about I/O Setup options.

Opening the I/O Setup

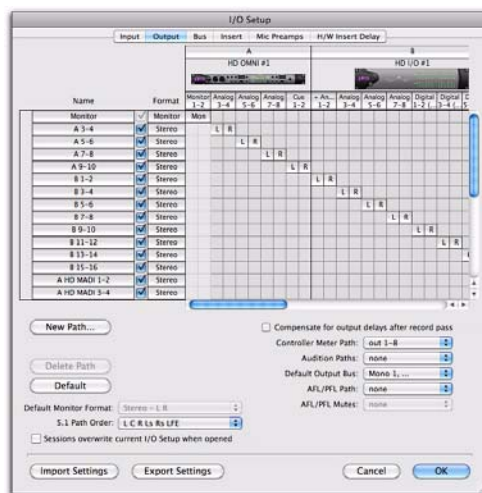
The I/O Setup dialog can be opened and configured whether or not a Pro Tools session is open.

To open the I/O Setup:

- 1 Make sure the proper audio engine is selected from the Current Engine pop-up menu in the Playback Engine dialog.
- 2 Make sure the hardware you are using for I/O is enabled and configured properly in the Hardware Setup dialog. Avid audio peripherals can be enabled and configured in the Hardware Setup dialog.

 For Pro Tools Aggregate I/O and other third-party software, click the *Launch Setup App* button to enable and configure your hardware.

- 3 Choose Setup > I/O.



I/O Setup dialog for a Pro Tools|HD system with HD OMNI and HD I/O shown

Closing the I/O Setup

To close the I/O Setup and save changes:

- Click OK.

When you click OK, Pro Tools checks several settings for routing validity (to prevent feedback loops) and notifies you if there is a problem (see “Valid Paths and Requirements” on page 21).

To close the I/O Setup without saving changes:

- Click Cancel.

I/O Setup Pages

The I/O Setup provides tabs to access different pages for configuring I/O Settings.

To open any specific I/O Settings page:

- Click the corresponding tab at the top of the I/O Setup dialog.



Press Command+Left or Right Arrow keys (Mac) or Control+Left or Right Arrow keys (Windows) to move through the different pages of the I/O Setup dialog.

I/O Setup provides the following pages for configuring I/O Settings:

Input Configure input path names, formats, and source channel (analog or digital). Multichannel input paths (stereo or greater) can have any number of sub-paths. You can also have overlapping Input signal paths. Input names, channel widths, and physical input mappings are stored with both the system and the session, and can be recalled from either.

Output Configure output path names and formats. You can have overlapping Output paths. Output names, channel widths, and physical output mappings are stored with both the system and the session, and can be recalled from either.

Bus Configure internal and output bus path names and formats, and map output buses to output paths (as defined on the Output page). Multichannel busses (stereo or greater) can have any number of sub-paths. Bus names and channel widths are saved with and recalled from the session. Output bus paths to output channel mappings are automatically generated depending on the defined session output bus paths and the available system output paths.

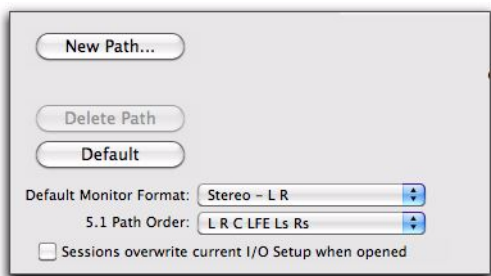
Insert Configure insert path names, formats, and destinations (audio interface channels). You can have overlapping insert paths. Insert names, channel widths, and physical input and output mappings are stored with both the system and the session, and can be recalled from either.

Mic Preamps Map Avid PRE peripheral outputs to an audio interface's inputs to establish communication between Pro Tools and PRE. PRE channel mappings are stored with both the system and the session, and can be recalled from either.

H/W Insert Delay Set the amount of Delay Compensation (in milliseconds) for each external device. These times will be used by the Delay Compensation Engine to time align input paths when the hardware insert is in use and Delay Compensation is enabled. The H/W Insert Delay settings are stored with both the system and the session, and can be recalled from either.

Sessions Overwrite Current I/O Setup When Opened

This option determines whether or not, when opening a session, Input, Output, and Insert I/O settings as currently configured on your system will be overwritten by any of these I/O Settings stored with a session.



I/O Setup dialog showing Sessions Overwrite button

💡 *Enable the Sessions Overwrite Current I/O Setup When Opened option for legacy Pro Tools behavior (versions lower than 8.1). This option is enabled by default.*

◆ When the Sessions Overwrite Current I/O Setup When Opened option is disabled, Pro Tools recalls these settings from the system. Choose this option when exchanging sessions among different systems running Pro Tools 8.1 or higher (see “Session Interchange” on page 24).

◆ When the Sessions Overwrite Current I/O Setup When Opened option is enabled (default), Pro Tools recalls these settings from the session rather than the system. Choose this option when exchanging sessions with systems running lower versions of Pro Tools (see “Session Interchange” on page 24).

💡 *Enabling or disabling this option in any page of the I/O Setups affects all of the other pages as well.*

Customizing I/O Settings

The following section shows how to customize your I/O settings for your particular studio setup. Making sure that Sessions Overwrite Current I/O Setup When Opened option is not enabled ensures that your custom settings remain intact when opening sessions.

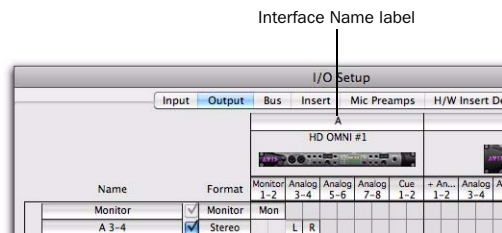
💡 *If you are using an HD OMNI, be sure to configure the Monitor page of the Hardware Setup for HD OMNI before configuring the I/O Setup. For more information, see the HD OMNI Guide.*

To customize I/O Settings:

1 Open the I/O Setup (Setup > I/O).
2 If desired, import I/O settings from an existing I/O settings .pio file (see “Importing I/O Settings” on page 23).

💡 *You can prepare a session for use on a different system this way. Any paths for hardware that is not present on the current system will appear as inactive.*

3 In the I/O Setup, double-click the label above an interface and enter a name.



Interface Names

💡 *With systems using Pro Tools|HD hardware, the I/O Setup bases default Input and Output path names on the custom name given to the interface.*

4 Click the Input tab:

- Create input paths and sub-paths with appropriate widths and mappings to physical inputs that match your studio configuration (see “Creating New Paths” on page 11).
- If desired, rename input paths and sub-paths to match your studio configuration.

5 Click the Output tab:

- Create output paths with appropriate widths and mapping to physical outputs that match your studio configuration.
- If desired, rename output paths to match your studio configuration. Use standard industry terminology whenever possible (see “Recommended Output Path Naming Schemes” on page 14).



Using the recommended names for outputs paths in sessions allows Pro Tools to attempt to automatically remap input and output paths when opening a session created on different Pro Tools systems. See “Session Interchange” on page 24 for more information.

6 If you plan on using hardware inserts, click the Insert tab:

- Create insert paths with appropriate widths and mappings to physical inputs and outputs matching your studio configuration.
- If desired, name insert paths to match your studio configuration.
- Click the H/W Insert Delay tab and enter the correct insert delay in milliseconds for each input/output pair that you are using for hardware inserts. (For information about measuring latency with hardware inserts, see the *Pro Tools Reference Guide*.)

7 If you are using one or more Avid PRE peripherals, click the Mic Preamps tab and configure it accordingly (see the *PRE Guide*).

8 Click the Bus tab.

9 Create internal mix bus paths and sub-paths as desired. Ensure that output busses are mapped to the correct output paths (see “Output Busses” on page 19).



Output busses are automatically created and mapped to outputs when new output paths are created.

10 In any of the I/O Setup pages, make sure that the Sessions Overwrite Current I/O Setup When Opened option is not enabled. This way, when opening sessions created on another system, your custom I/O settings will remain intact.



If you want the I/O settings stored with a session to override your custom I/O settings, before opening the session enable the Sessions Overwrite Current I/O Setup When Opened option. Export your I/O settings (see “Importing I/O Settings” on page 2) to create a backup.

11 If desired, export your I/O settings to create a backup of your current settings (see “Exporting I/O Settings” on page 24).

12 Click OK. You should not have to open the I/O Setup again unless you add or remove hardware to or from your system, or if you open a session created on a different system (see “Session Interchange” on page 24).


Input and Output Signal Routing Overview

To better understand how audio signals are routed to and from physical I/O to Pro Tools, consider the following two examples.

Signal Path Routing for Audio Input

Figure 1 on page 8 shows the signal path from the physical analog input of an HD OMNI audio interface, and then through the Pro Tools audio input path to the Input of an audio track in the Pro Tools mixer:

1 For Pro Tools|HD interfaces such as the HD OMNI, the physical inputs that are available to Pro Tools are set on the Main page of the Hardware Setup (this selector is mirrored in the Input page of the I/O Setup).

 *For Pro Tools systems such as the Mbox and the 003, physical inputs are fixed. For third-party and built-in hardware, click the Launch Setup App button for available configuration options.*

2 Main input paths and sub-paths are assigned (patched) to physical inputs using the Grid in the I/O Setup. In this example, audio input is routed from HD OMNI physical inputs Analog 1–2 to Pro Tools Input channels A 1–2.

3 Input paths and sub-paths are routed to track inputs in the Pro Tools mixer by selecting the path (or sub-path) from the Track Input selector. In this example, input sub-path A1 is routed to the input of audio track “Audio 1.”

Signal Path Routing for Audio Output


Figure 2 on page 9 shows the signal path from the output of an audio track, through an output bus mapped to an output path that is routed to a physical output on an HD I/O audio interface:

1 Audio is played back from disk and routed from the Track Output to Output Bus “B 1–2.”

2 The Output Bus is defined on the Bus page of the I/O Setup. On the Bus page of the I/O Setup, the Output Bus “B 1–2” is mapped to Output “B 1–2,” which is defined on the Output page of the I/O Setup.

3 On the Output page of the I/O Setup, the Grid is used to route the output path (to which the output bus is mapped) to physical outputs.

4 For Pro Tools|HD interfaces such as the HD OMNI, the physical outputs that are available to Pro Tools are set on the Main page of the Hardware Setup (this selector is mirrored in the Output page of the I/O Setup).

 *For Pro Tools systems such as the Mbox and the 003, physical outputs are fixed. For third-party and built-in hardware, click the Launch Setup App button for available configuration options.*

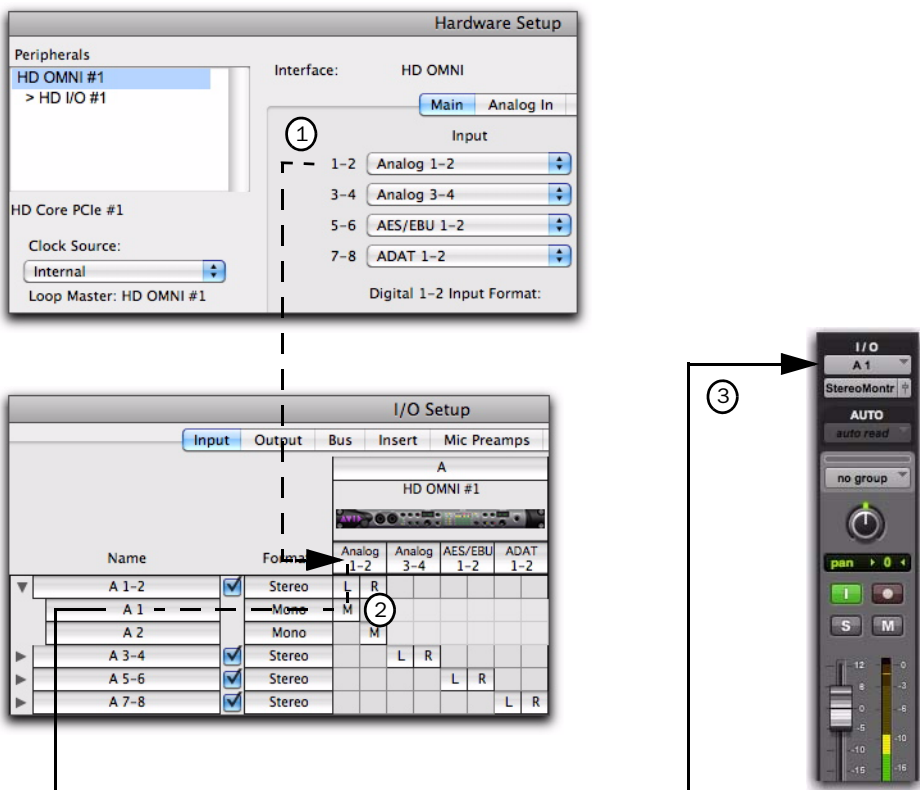


Figure 1. Input signal path from an HD OMNI to the Pro Tools mixer as mapped in I/O Setup

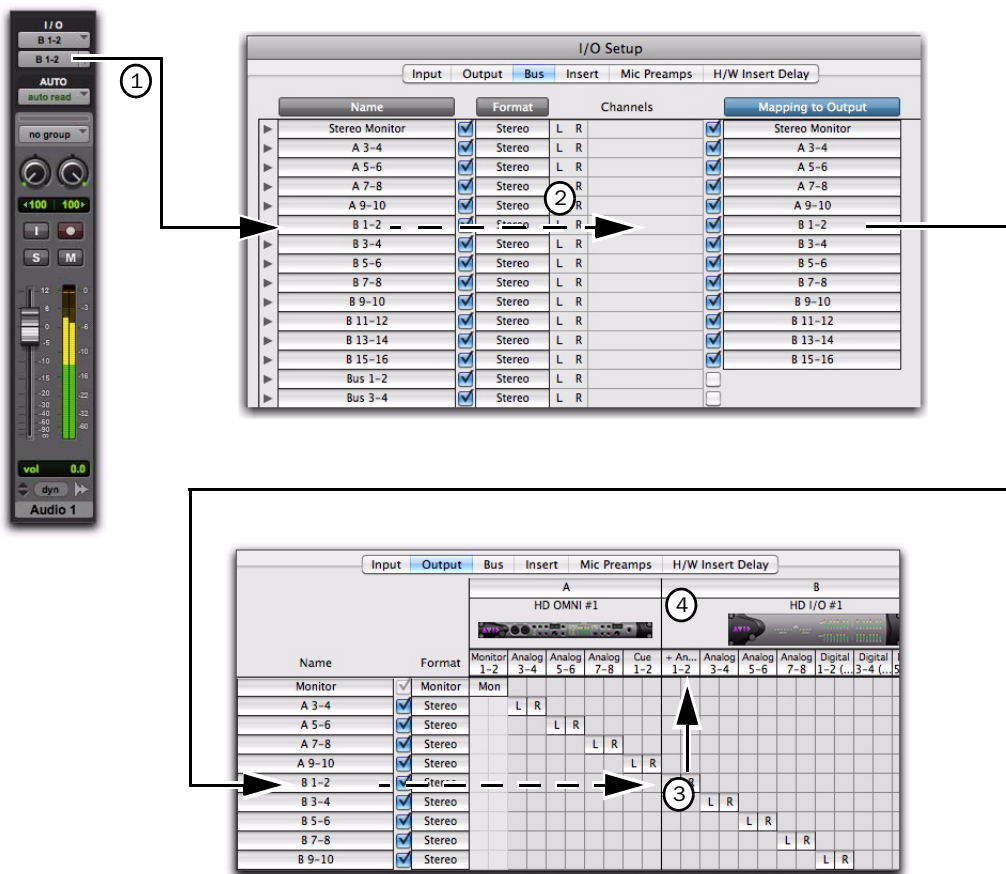


Figure 2. Output signal path from an audio track to a physical output as mapped in I/O Setup

Pro Tools Signal Paths

A signal path is a logical grouping of multiple inputs, outputs, or busses that has a single name and (channel) format. The I/O Setup lets you define and name paths according to the configuration of your studio and the needs of each session.

Main Paths and Sub-Paths

Paths in Pro Tools tracks and I/O Setup include *main paths* and *sub-paths*.

Main Paths *Main* paths are logical groupings of inputs, inserts, busses, or outputs. For example, a master stereo output path will include both its left and right channels.

Sub-Paths A *sub-path* represents a signal path within a main path. For example, a default stereo output bus path consists of two mono sub-paths, left and right. Mono tracks and sends can be routed to either mono sub-path of the stereo output bus path.



It is especially useful to define and name sub-paths for complex mixing setups, such as a 5.1 Surround mix.

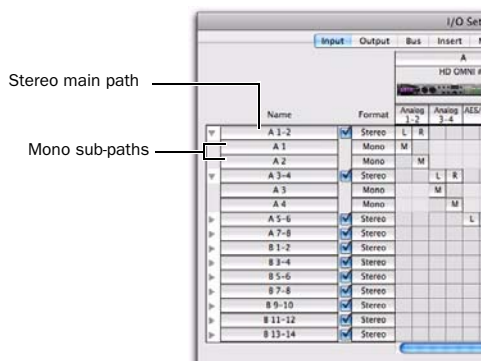
Paths in Sessions

In sessions, signals are routed to and from tracks, sends, and inserts using track Input, Output, Insert, and Send selectors.

When you click a track Input, Output, Insert or Send selector, the paths created and defined in the IO Setup appear in the list of available paths.

Paths in the I/O Setup

The signal routing path choices available in a session are defined in the I/O Setup.



Main and sub-paths in I/O Setup

Unavailable items (including hardware, paths, or required resources) remain in the session as inactive items (see “Making Paths Active or Inactive” on page 17).

When you create a new session, you can specify which I/O Settings to use. For example, you can use the “Last Used” setting, the factory installed settings, or one of any available custom I/O settings files.



See “Factory I/O Settings” on page 22 and “I/O Settings Files” on page 22 for more information

Default I/O Settings

Pro Tools comes with default I/O Setup settings to get you started (see “Factory I/O Settings” on page 22). You should only need to open the I/O Setup if you want to customize I/O paths or if you change your system hardware (for example, adding an expansion card to HD I/O, or adding or removing an audio interface). You can always return to the default settings for an I/O Settings page by clicking the Default button.

Creating New Paths

The I/O Setup lets you create new paths with custom names, formats, and assignments to physical I/O. Custom path names appear in a session's track Input, Output, Insert, and Bus selectors.

To create a new path:


- 1 Choose Setup > I/O.
- 2 Click the Input, Output, Insert, or Bus tab to display the corresponding path type.
- 3 Click New Path.
- 4 In the New Path dialog, specify the number of new paths you want to create, the channel width for each path, and the path name.



New Paths dialog


- 5 Do any of the following:

 - To add more paths, click the Add Row button.

 *Add a new path by pressing Command+N (Mac) or Control+N (Windows), or by pressing Command+Plus (+) (Mac) or Control+Plus (+) (Windows) on the numeric keypad.*

– OR –

- To remove a path, click the Remove Row button.

 *To remove the last path from the New Path dialog Command+Minus (–) (Mac) or Control+Minus (–) (Windows).*

- 6 Enable (or disable) the New Paths options Add the Default Channel Assignments and Auto-Create Sub-paths as desired.

- 7 Click Create.



When you create a new Output path, an Output Bus is automatically created on the Bus page of the IO Setup, and is automatically mapped to the Output path you created. See “Output Busses” on page 19.

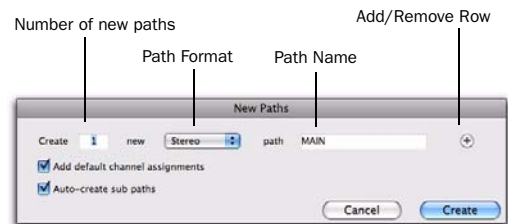
- 8 Assign the path to a specific hardware input or output (Input, Output, and Insert pages only) in the Grid. See “Assigning Paths to Hardware I/O” on page 17.

- 9 Repeat the previous steps to configure all path types (Input, Output, Insert, or Bus).

- 10 Click OK to save changes and close the I/O Setup. If there are any identically named paths, you will be instructed to correct them before the I/O Setup will close. For more information, see “Valid Paths and Requirements” on page 21.

New Paths Dialog

The New Paths dialog lets you create new paths on the Input, Output, Bus, and Insert pages of the I/O Setup.



New Paths dialog

New Path Row Settings

Number of New Paths Enter the number of new paths you want to create (or a certain type, like “Bus”).

Path Format Select the channel width (mono, stereo, or any available surround formats) from the Path Format selector.

Path Name Enter the path name. If you are creating more than one path, the number of each new path created will be appended to the path name (for example, Bus 1, Bus 2, Bus 3, and so on).

Add/Remove Rows Click the Add Row button to add more paths, or click Click the Remove Row button to remove paths.

Move Row Icon Click and drag a Move Row icon up or down to reorder paths.



Move Row icon in the New Paths dialog

Add Default Channel Assignments Option

Enable Add Default Channel Assignments option if you want Pro Tools to automatically assign input, output, and insert paths to physical inputs and outputs in the Grid (from the first available channel to the maximum number of channels available). If the number of new paths of a certain width exceeds the number of available channels, Pro Tools wraps around and starts over at channel 1.

See “Assigning Paths to Hardware I/O” on page 17 for more information for more information on assigning channels in the Grid.

Auto-Create Sub-Paths Option


For input, bus, and insert paths, enable (or disable) the Auto Create Sub-Paths option to have Pro Tools automatically create the default set of sub-paths for the path format (channel width), as follows:

Default Sub-Paths

Main Path	Sub-Paths	Sub-Path Name
Mono	N/A	N/A
Stereo	2 mono	<main path name> followed by channel designation .L and .R
LCR	1 Stereo (LR), 3 Mono (one for each channel)	Stereo: <main path name>.LR Mono: <main path name>.L, .C, .R
LCRS	1 Stereo (LR), 4 Mono (one for each channel)	Stereo: <main path name> .LR Mono: <main path name>.L, .C, .R, .S
Quad	1 Stereo (LR), 4 Mono (one for each channel)	Stereo: <main path name> .LR Mono: <main path name>.L, .R, .Ls, .Rs
5.0 – 6.0 – 7.0	1 Stereo (LR), 5–7 Mono (one for each channel)	Stereo: <main path name>.LR Mono: <main path name>.L, .C, .R, .Ls, .Rs, and so on
5.1 – 6.1 – 7.1	1 Stereo (LR), 6–8 Mono (one for each channel)	Stereo: <main path name>.LR Mono: <main path name>.L, .C, .R, .Ls, .Rs, and so on, and LFE

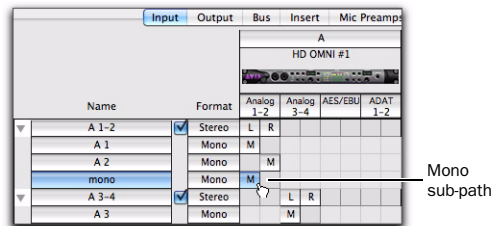
Creating New Sub-Paths

You can create sub-paths for main paths in the Input, Bus, and Insert pages of the I/O Setup.


 *You cannot create sub-paths for outputs in the Outputs page of the IO Setup. You can, however create overlapping output paths.*

To create a new sub-path:

- 1 Select the page of the I/O Setup where you want to create sub-paths (such as the Input page).
- 2 Select the Main path for which you want to create sub-paths.
- 3 Click New Sub-Path.
- 4 Name the new sub-path.
- 5 Select the Format for the new sub-path (such as Mono).
- 6 Click in the channel mapping matrix to map the new sub-path channels to available main path channels.



New mono Input sub-path for Main path A 1-2

 *On Pro Tools|HD systems, to optimize DSP resources it is best to create mono sub-paths for internal mix busses, rather than mono main paths.*

Editing Paths

The I/O Setup lets you edit or customize signal path definitions.

Paths can be:

- Restored to default configurations
- Renamed, for easier identification after changing or renaming audio interfaces
- Selected and reordered to change menu order in track selectors
- Selected and deleted
- Remapped to or from different sources or destinations
- Deactivated (or reactivated) to manage unavailable or unnecessary I/O resources

The following table lists the attributes that you can edit for each path type:

Path options that can be edited by type

Path Type	Path Options (Attributes)
Input	Names, formats, and source channel (physical input)
Output	Names, formats, and destination channel (physical output)
Insert	Names, formats, and destination (physical inputs and outputs)
Bus	Names, formats, output mapping

Interface names can also be renamed.

Renaming Paths

Path names can be customized in the I/O Setup.

💡 *I/O paths can also be renamed directly from the Edit or Mix window by right-clicking the Input or Output selector and choosing Rename. However, editing path names here does not change the path names in the I/O Setup.*

To rename a path in the I/O Setup:

- 1 Double-click the path name.
- 2 Type a new path name.
- 3 Click OK to save changes and close the I/O Setup.

Recommended Output Path Naming Schemes

It is recommended that you use standard industry terminology when renaming output paths. If multiple systems share common output path names, when opening a session created on another system Pro Tools can automatically remap the session's output buses to the outputs on your system.

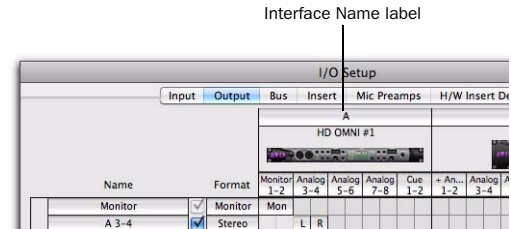
📖 See “Session Interchange” on page 24.

Renaming Interfaces

Audio interfaces can be renamed in the IO Setup. When you rename Pro Tools|HD interfaces, default path names are based on the custom name given to the interface.

To rename an audio interface in the I/O Setup:

- 1 Double-click the label above an interface.



Interface Names

- 2 Type a new interface name.
- 3 Click OK to save changes and close the I/O Setup.

Use the following names for output paths:

- Main A, Main B
- Studio A, Studio B
- Stereo A, Stereo B
- Meter
- Monitor
- Aux A, Aux B
- Cue A, Cue B, Cue C, Cue D, Cue E, Cue F, Cue G, Cue H, Cue I, Cue J
- Dial Main, Dial A, Dial B, Dial C, Dial B, Dial E
- Efx Main, Efx A, Efx B, Efx C, Efx D, Efx E
- Music Main, Music A, Music B, Music C, Music D, Music E

Default Path Names

Default names for input, output, and insert paths are based on the type of hardware you are using for physical I/O.

For Pro Tools|HD systems, default path names are based on the names of interfaces you are using. If you have renamed your interface, default path names are based on the custom name.

Restore Default Paths and Path Names

You can restore I/O Setup paths to their default state at any time. You may want to restore defaults if, for example, you replace or add an audio interface to your system.

To restore default paths and path names:

- 1 Choose Setup > I/O.
- 2 Click the Input, Output, Insert, or Bus tab to display the corresponding path type.
- 3 Click Default. Pro Tools does the following:
 - If a session is open, deletes any paths that are not in use.
 - Creates new default paths up to the capacity of your system's available physical I/O and resources.
 - Resets path names to the default path names, defined by . These default path names appear in track Input and Output Path selectors.



Option-click (Mac) or Alt-click (Windows) the Default button to set all pages of I/O Setup to the default settings.

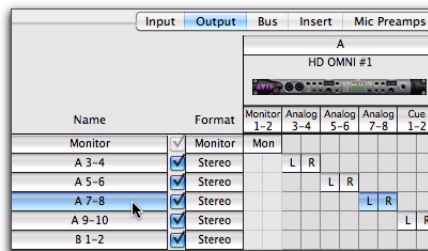
- 4 Click OK to save changes and close the I/O Setup.

Selecting Paths

Individual and multiple paths can be selected in the I/O Setup Path Name column. Selected paths and sub-paths can be reordered higher or lower in the Path Name column to change their menu order in track Input, Output, Insert, and Bus selectors. Paths can also be deleted. Sub-paths follow their main paths when they are moved in the I/O Setup.

To select a main path or sub-path:

- Click the path name.



Selecting paths in the I/O Setup

To select a range of paths:

- 1 Click the path name.
- 2 Shift-click an additional path name.

All paths between the first selected path name and the additional path name will also be selected.

To select or deselect noncontiguous paths, do one of the following:

- Command-click (Mac) or Control-click (Windows) path names that are un-highlighted to select them.
- OR –
- Command-click (Mac) or Control-click (Windows) path names that are highlighted to deselect them.

To select all paths and sub-paths:

- Option-click (Mac) or Alt-click (Windows) any path name that is un-highlighted.

To deselect all paths and sub-paths:

- Option-click (Mac) or Alt-click (Windows) any path name that is highlighted.

Reordering Paths

Selected paths and sub-paths can be reordered to be higher or lower in the Path Name column.

Path order in the I/O Setup (from top to bottom) determines the order in which paths appear in track Input, Output, Send, and Insert (for hardware inserts) selectors. Additionally, path order is important when exchanging sessions between different Pro Tools systems (see “Opening Older Sessions in Pro Tools 8.1 and Higher” on page 25).

To reorder paths in the I/O Setup and Track selectors:

- 1 Drag one or more selected path names up or down to a new location in the list.
- 2 Click OK to save changes and close the I/O Setup.

Deleting Paths

Path definitions can be deleted from the I/O Setup to reflect changes to your hardware setup, or to clean up track selector menus by removing unwanted or unnecessary path definitions. After deleting a path, any tracks or send assignments to that path are reset to No Output.



The Monitor path for HD OMNI is fixed and cannot be deleted.

To delete a main path or sub-path:

- 1 In the I/O Setup, select the path you want to delete.
- 2 Click Delete Path.
- 3 Click OK to save changes and close the I/O Setup.


To delete all paths:

- 1 Option-click (Mac) or Alt-click (Windows) any path name.
- 2 Click Delete Path.
- 3 Click OK to save changes and close the I/O Setup.

Making Paths Active or Inactive

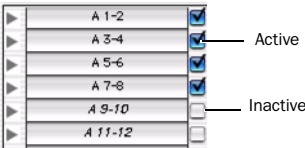
Pro Tools paths can be Active (on) or Inactive (off, or unavailable). Paths can be globally activated or deactivated in the I/O Setup. Making a signal path inactive will turn off the signal path on any and all tracks currently assigned to it.

Pro Tools also sets unavailable paths to inactive. Paths can be unavailable when hardware or other system resources are unavailable, such as when opening a session saved on a different system. Tracks can also be made active or inactive. For information, see the *Pro Tools Reference Guide*.

 *The Monitor path for HD OMNI is fixed and cannot be deleted.*

To globally activate or deactivate a path:

- 1 Choose Setup > I/O.
- 2 Select a path type using the tabs at the top of the window.
- 3 Set the Active/Inactive control for the path.



Active and inactive path settings in I/O Setup

- 4 Click OK to save changes and close the I/O Setup. Path status is displayed as follows:

Italics Indicates the path is inactive.


Non-Italics Indicates the path is active.

Assigning Paths to Hardware I/O

Paths are assigned to specific inputs, outputs, and inserts in the Grid. Paths can be assigned to physical I/O in the Grid, and can be reassigned at any time.


To assign channels:

- 1 Select (or create) a main path or sub-path.
- 2 Select the channel Format (such as Stereo).
- 3 In the row for the selected path, click in the Grid column under an audio interface and channel.

		HD OMNI #1					
							
Name	Format	Monitor 1-2	Analog 3-4	Analog 5-6	Analog 7-8	Cue 1-2	
Monitor	Monitor	Mon					
A 3-4	Stereo						
A 5-6	Stereo			L R			
A 7-8	Stereo				L R		

Assigning channels

Other channels for the path type, if any, fill to the right. For example, when assigning a new stereo path, clicking in the path row under output channel 1 fills both channel 1 and 2 (left to 1, right to 2).

 *To reassign channels in a path, see “Reassigning Paths” on page 18.*

- 4 Click OK to save changes and close the I/O Setup.

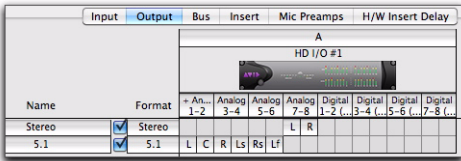
If there are any invalid settings, you will be required to correct them before the I/O Setup will close. For more information, see “Valid Paths and Requirements” on page 21.

Assigning Paths with the Surround Mixer

(Pro Tools HD and Pro Tools with Complete Production Toolkit 2 Only)

When assigning multichannel surround paths, the left channel (L) is assigned first to the clicked Grid box, and remaining channels fill immediately to the right according to the default path order.

Because some multichannel mixing formats use unique track layouts, Pro Tools lets you set the default format in the I/O Setup.



Customized output paths for a 5.1 mix

Reassigning Paths

You can move the individual assignments to different channels, to reorder the path's definition (for example, changing a multichannel path to L-R-C-LF-LS-RS).

To reassign channels in a path:

- Drag the channel to the new location in the Grid. Other channel assignments move (shuffle) to accommodate dragged channels.

Channel Shuffling

Moving a signal from right to left results in a shuffle of other signals after the new destination channel. Moving a signal from left to right shuffles any and all signals after the new destination channel and leaves the previous channel empty.

⚠ Changing a path's format erases any current channel assignment.

Sub-Paths Follow Main Paths


When a main path is reassigned or shuffled, the main path's subpaths automatically move with the main path. For example, reassigning a stereo path to different hardware outputs results in any of its sub-paths moving with it.

Configuring Busses

Busses appear on the Bus page of the IO Setup. Pro Tools provides two types of busses:

- Output busses
- Internal mix busses

Output bus and internal mix bus settings are saved with and recalled from the session.

 See "Session Interchange" on page 24 for more information exchanging sessions between systems, and on opening sessions in lower version of Pro Tools. Output busses do not exist in Pro Tools 8.0.4 and lower.

Output Busses

When you create a new output path on the Output page of the I/O Setup, a new output bus of the same width is automatically created and mapped to that output path. Output busses are also created and mapped according to default settings when creating a new session or restoring defaults (see “Restore Default Paths and Path Names” on page 15).

Physical outputs for output paths are configured on the Outputs page of the I/O Setups (see “Assigning Paths to Hardware I/O” on page 17).



To better understand how output busses work in I/O Setup, consider how an analog console works. In Pro Tools, the output bus is equivalent to a console's bus system. The output bus on the left side of the Bus page is analogous to the outputs on a console's patchbay. The Mapping to Output selector is like the patch cords used to patch into the studio's various audio feeds, which in turn are like the physical output paths as defined on the Outputs page.

Internal Mix Busses

Pro Tools 9.0 provides up to 256 internal mix busses and are used to route audio signal from track outputs and sends to other track inputs (lower versions of Pro Tools provide less busses). Common uses for internal mix busses include effects sends and returns (such as bussing sends from audio tracks to an Auxiliary Input track for plug-in effects processing) and bus recording.

Internal mix busses can also be mapped to any outputs (see “Internal Mix Busses” on page 19)

Creating and Mapping Busses to Outputs

Any available bus can be mapped to any of the available output paths of the same channel width or greater. For example, a mono bus can be mapped to a mono output path, a stereo bus can be mapped to a stereo output path, and a 5.1 surround bus can be mapped to a 5.1 surround output path.

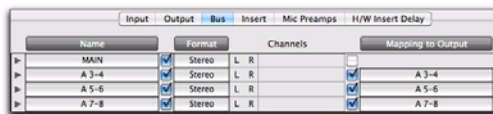
To create a bus and map it to an output path:

- 1 On the Bus page of the I/O Setup, click New Path.
- 2 In the New Paths dialog, specify the number of new paths you want to create, the channel width for each path, and the path name.



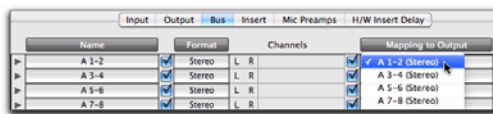
New Paths dialog

- 3 Click Create to create the new paths.



Unmapped “MAIN” output bus

- 4 Enable Mapping To Output for the bus path.
- 5 Select the desired output path from the Mapping To Output selector.



Mapping the “MAIN” output bus to output path “A 1-2”

Any signals from tracks or sends sent to the bus are now sent to the hardware outputs assigned to the corresponding Output paths.

To map all output busses of the same format to an output path:

- Option-click (Mac) or Alt-click (Windows) any Mapping To Output selector and select the desired output path (mono or stereo).

All mapped output busses of the same format (such as stereo) are all assigned to the same output path. For example, you can assign all stereo output busses to output path A 1–2.

To map all output busses of the same format to one output path:

- 1 Do one of the following:
 - Shift click to select contiguous Output busses.
 - or –
 - Command-click (Mac) or Control-click (Windows) to select noncontiguous Output busses.
- 2 Option-Shift click (Mac) or Alt-Shift-click (Windows) the Mapping To Output selector for one of the selected Output busses and select the desired output path (mono or stereo).

Only the selected mapped output busses of the same format (such as stereo) are assigned to the same output path. For example, you can assign only the selected stereo output busses to output path A 1–2.

To map all busses of the same format to unique ascending output paths (cascading):

- Command-Option-click (Mac) or Control-Alt-click (Windows) the Mapping to Output selector of the top-most output path and select the first output path.

All busses of the same channel format are automatically assigned to unique output path assignments in ascending order. For example, for stereo output paths, output bus A 1–2 is assigned to output path A 1–2, A 3–4 to A 3–4, A 5–6 to A 5–6, and so on.


Resetting Busses

You can reset the number of available internal mix busses in your session to match your system's full capabilities by reverting to the default bus configuration.



Pro Tools creates 128 (out of 256) internal busses by default.

To revert to the default bus configuration for your system:

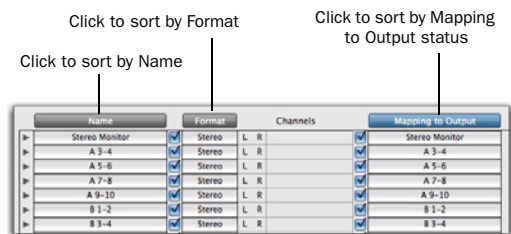
- 1 Open the I/O Setup.
 - 2 Click the Bus tab in the upper left.
 - 3 From the pop-up menu to the right of the Default button, select one of the following:
 - All Busses
 - Output Busses
 - Internal Busses
 - 4 Click Default.
-  *Resetting busses to the default setting will rename all busses to their default name (Bus 1–2, Bus 3–4, and so on).*
- 5 Click OK to save changes and close the I/O Setup.

Active Busses

The Bus page of the I/O Setup displays the number of active internal mix busses. If the number of active busses exceeds the number of available busses (256), the display turns red. Delete or disable any active busses in excess of the available number of busses to be able close the I/O Setup and save your settings.

Sorting Bus Paths

The Bus page provide controls to sort busses by name (ascending or descending), format (ascending or descending), or by mapped to output status (ascending only).



Sorting bus paths in the I/O Setup

To sort bus paths by Name:

- 1 In the Bus page, click the Name column header.
- 2 Click the Name column header again to toggle between ascending and descending sort order.

To sort bus paths by Format:

- 1 In the Bus page, click the Format column header.
- 2 Click the Format column header again to toggle between ascending and descending sort order.

To sort bus paths by Mapping To Output status:

- In the Bus page, click the Mapping To Output column header.

Valid Paths and Requirements

While configuring the I/O Setup, certain rules apply for path definition and channel assignment. All paths must be valid before the I/O Setup configuration can be applied.

Though it is possible to set up invalid assignments in the Channel Grid, Pro Tools will not accept an I/O Setup configuration unless all paths meet the path definition and channel assignment requirements, as follows:

Minimum Path Definitions All paths must have a name, be of a specific format, and have a valid I/O assignment.

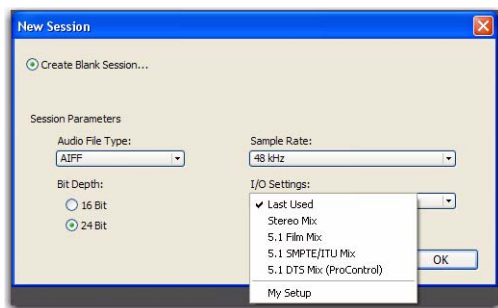
Valid Paths Channel assignment follows certain rules regarding overlapping paths.

- There can be no partial overlaps between any two output paths.
- A newly-created output path must either be completely independent of other assigned outputs (not assigned to any other available I/O interface/channels), or it must be an overlapping path or sub-path completely contained within a larger path (for example, an LCR sub-path within a larger 5.1 path).

Factory I/O Settings

Pro Tools provides factory I/O settings for stereo and surround mixing, and are automatically installed with Pro Tools. These settings provide new sessions with generic path and sub-paths for either mixing format.


Factory I/O settings are available in the I/O Settings pop-up menu of the Quick Start or New Session dialog.



New Session dialog showing I/O Settings pop-up menu

Stereo Mix Settings


This Stereo Mix setting creates the maximum number of stereo paths, as determined by the available system's I/O Setup and hardware configuration.

 Using the "Stereo Mix" settings file has the same effect as clicking Default for every individual tab in I/O Settings. See "Restore Default Paths and Path Names" on page 15.

Surround Mix Settings

(Pro Tools HD and Pro Tools with Complete Production Toolkit 2 Only)

The Surround Mix setting provides additional, surround-specific Output and Bus settings files.

 See the *Complete Production Toolkit 2 Guide* or the *Pro Tools Reference Guide* for more information on available surround formats.

I/O Settings Files

I/O settings files (.pio files) provide default path configurations for new sessions. I/O settings can be imported and exported for use with sessions shared between systems. I/O settings files are also available in the I/O Settings pop-up menu in the Quick Start and New Session dialogs.

For I/O Settings files to be available in the Quick Start or New Session dialogs, I/O settings files must be saved to the IO Settings folder in the following locations:

Mac Applications/Digidesign/Pro Tools/IO Settings

Windows Program Files\Common Files\Digidesign\DAE\IO Settings


Last Used I/O Settings

If any changes are made to the I/O Setup, these changes are automatically saved to the IO Settings folder as the Last Used settings file when the I/O Setup is closed (by clicking OK).

Last Used settings are available in the IO Settings pop-up menu in the Quick Start or New Session dialog, or when importing I/O Settings in the I/O Setup.

Custom I/O Settings

Custom I/O Settings files can be created by changing I/O Setup settings and then exporting the settings. Custom I/O settings are available in the IO Settings pop-up menu in the Quick Start or New Session dialog, or when importing I/O Settings in the I/O Setup.

 See “Customizing I/O Settings” on page 5 and “Exporting I/O Settings” on page 24 for more informations.


Importing and Exporting I/O Settings Files

You can import and export I/O Setup configurations as I/O Settings files (.pio files). This lets you save settings for different projects, import settings for reconfiguring I/O Setup, and manage path definitions and signal routing setups.

Importing I/O Settings

I/O Settings can be imported before or after you open a session. I/O Settings are only imported for the current page of the I/O Setup. For example, if you are viewing the Output page and import I/O Settings, only the settings for the Output page are imported. This helps to avoid overwriting your custom I/O Settings on other pages.

When you import I/O Settings, you can choose to delete any unused path definitions before importing the new paths, or leave unused path definitions intact and add the new paths to the current I/O Setup configuration.

 You can also import I/O paths and path names, as well as other session data, from a different session by using the Import Session Data command (File > Import > Session Data).

To import I/O Settings:

- 1 Click the tab for the page of the I/O Setup for which you want to import settings.
- 2 Click Import Settings.



Option-click (Mac) or Alt-click (Windows) the Import Settings button to import settings to all pages of I/O Setup.

- 3 Select an I/O settings file in the Import Settings dialog and click Import.
- 4 A dialog appears asking whether you want to delete existing paths. Do one of the following:
 - Click Yes to remove any unused paths and add the imported paths to the current I/O Setup configuration. Any I/O assignments and automation data associated with the unused paths are also deleted.
 - or –
 - Click No to add the imported paths to the current I/O Setup configuration.

If the import results in overlapping paths, the new paths will appear in the I/O Setup as Inactive. See “Making Paths Active or Inactive” on page 17.

After importing I/O Settings, you can then reassign path routing definitions in the I/O Setup by remapping, renaming, and deleting paths. See “Pro Tools Signal Paths” on page 10.

Exporting I/O Settings

When you export I/O settings, all pages of the I/O Setup are exported.

To export and save an I/O Setup configuration as a custom I/O Settings file:

- 1 Configure the I/O Setup settings as desired.
- 2 Click Export Settings.
- 3 Name and save the settings file. The settings file is appended with “.pio” to distinguish it as an I/O settings file.



To start sessions with a blank or empty I/O Setup, you can create and export an I/O Settings file in which all definitions have been deleted.

Session Interchange

When exchanging a session between Pro Tools systems, you may need to reconfigure the session's I/O settings. This will depend on system ID, path names and/or path format, as well as on the Pro Tools versions of each system on which the session is transferred.

Path Names and Automatic Output Bus Remapping

A *system ID* is created and saved in a session for every computer the session is opened on (using the computer's MAC address). If Pro Tools finds a matching system ID when opening a session, output paths are restored and no reconfiguring is necessary.

When a Pro Tools session is opened on a system for the first time, Pro Tools attempts to automatically remap output busses.

If Pro Tools does not find a matching system ID, Pro Tools attempts to remap output busses according to the following criteria (in order):

Path Name and Format Path names must be exactly the same, and of the same format. Use the suggested path naming schemes (see “Recommended Output Path Naming Schemes” on page 14).

Path Format Only If matching path names are not found, Pro Tools remaps paths to existing paths of the same format (channel width).

Any output bus path that cannot be automatically remapped is opened as Inactive. You must manually remap those paths to an active output path.

Pro Tools Versions and Session Interchange

When exchanging a session between systems with different versions of Pro Tools software (such as your Pro Tools 9.0 system and a colleague's Pro Tools 8.x system), use the following to maintain paths and signal routing.

Pro Tools 8.1 and Higher

When exchanging sessions among systems running Pro Tools 8.1 or higher, it is generally recommended that the Sessions Overwrite Current I/O Setup When Opened option be disabled. This maintains any system IO settings when opening a session from another system (see “Sessions Overwrite Current I/O Setup When Opened” on page 5).

Pro Tools 8.0.4 and Lower

When exchanging sessions with systems running lower versions of Pro Tools, it is generally recommended that the Sessions Overwrite Current I/O Setup When Opened option be enabled (see “Sessions Overwrite Current I/O Setup When Opened” on page 5). In this case, any custom settings saved with the session that do *not* match your system may need to be reconfigured manually in the I/O Setup to match your current studio setup.



If you created a backup of your I/O settings, you can import settings after opening the session (see “Importing and Exporting I/O Settings Files” on page 23).

Opening Older Sessions in Pro Tools 8.1 and Higher

When opening sessions created in Pro Tools 8.0.4 and lower in Pro Tools 8.1 or higher, output paths from the legacy session are re-created as output buses. If the Sessions Overwrite Current I/O Setup When Opened option is enabled, the output buses are mapped to session output paths.



If your hardware configuration has changed, you may need to manually reconfigure output assignments in the Grid on the Output page of the IO Setup. See “Assigning Paths to Hardware I/O” on page 17.

Path Order and Overlapping Output Paths

When exchanging sessions between Pro Tools 8.1 or higher and Pro Tools 8.0.4 and lower, output paths and sub-paths are changed as follows, depending on the order in which they appear in the I/O Setups.

- ◆ If a session created in Pro Tools 8.1 or higher contains overlapping paths with a larger path created above smaller paths in the I/O Setup, the smaller paths are converted to sub-paths of the larger path when the session is opened in Pro Tools 8.0.4 and lower.
- ◆ If a session created in Pro Tools 8.1 or higher contains overlapping paths where a smaller path appears above a larger path in the I/O Setup, the larger path will be made inactive when the session is opened in Pro Tools 8.0.4 and lower.

Show Last Saved Setup and Show Current Setup

When a session is opened that contains path definitions for unavailable I/O interfaces, the I/O Setup lists those paths in italics.

Clicking the Show Last Saved Setup button displays the audio interfaces used in the original session. This temporary display lets you check the last saved I/O configuration for reference while configuring the I/O settings for your system.

Once a session has been opened with unavailable I/O retained, you can then reassign tracks to available I/O paths.



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