Autodesk®
Lustre® 2010
A Discreet® systems product

New Features Guide

Autodesk®

Autodesk® Lustre® 2010 Software

Trademarks

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Contents

Introduction 1

Topics in this chapter:

About the Documentation

Autodesk® Lustre® includes documentation that helps you install, configure, and use your product.

For a list of all the documentation available to you, visit *http://www.autodesk.com/lustre-documentation-2010*.

Refer to the Release Notes for all late-breaking information.

Lustre Configurations

When you purchase Lustre, you can choose from several configurations, depending on the type of workstation you want and the options you require. The following table describes each Lustre configuration.

Station	Configuration
Master Station	**Default** All features are available including the film workflow features, which consists of infrared channel dust removal, input resolutions greater than 2040x1556, output resolutions greater than 1920x1080, and bit depths greater than 10-bit. However, add-ons may be required to enable certain features. In addition, SD and HD I/O, as well as dual link and HSDL video formats, are default for the Master Station. **Add-Ons** The following features can be added to the Default configuration: the Slave Renderer, and up to three panels for the Autodesk control surface. The Slave Renderer requires a separate license.
Lustre Station	**Default** All features are available except for primary and secondary colour grading. The film workflow features, explained above, is also included, along with full dust removal functionality, and the ability to create geometries and masks. **With Primary Colour Correction** Includes all features of the default option as well as primary colour grading. **Add-Ons** The following features are available for either the Default configuration or the With Primary Colour Correction configuration, and require an additional license: SD and HD I/O, dual link and HSDL video formats, up to three panels for the Autodesk control surface, and the Slave Renderer.
Lustre HD Station	**Default** Most features are available, although support is not available for the film workflow features (explained above). Certain features require add-on licensing in order to be enabled. **Add-Ons** The following features can be added to the Default configuration: SD and HD I/O, dual link and HSDL video formats, the Slave Renderer, and up to three panels for the Autodesk control surface. The Slave Renderer requires a separate license.

Using the New Features Guide

This New Features Guide describes the new and updated features for this release of Lustre. For a quick look at the New Features, see What's New on page 5.

Some of the major features also have more information in this guide — just follow the links from the What's New chapter.

Accessing Online Help

Autodesk provides complete documentation in an accessible HTML help system that is displayed in a Web browser. The Help is automatically installed unless otherwise specified during the software installation.

You can install the Help on another system without installing Lustre. For Windows®, select Online Help only when prompted to select components in the Lustre Installer. For Linux®, you can copy the *Documentation/help* directory from the CD onto another workstation.

To start the help system from Lustre:

➤ Click the Help button, located in the lower-right corner of all menus, or press **Shift+F1**.

To start the help system from the desktop:

1. If using the Windows version of Lustre, select Start | Programs | Autodesk | lustre | Online Help from the Windows task bar.

   The Help appears in a browser window.

2. If using the Linux version of Lustre, open a shell and type:

   ```
   cd
   /usr/autodesk/lustre_<version_number>/help/index.html
   ```

To copy the Help to another system:

1. Copy the *Documentation/help* directory from the software CD-ROM to the new location on another system.

2. To start the Help after you copy the help directory, open the *help/html/_start_helpsystem.html* file.

Autodesk Media and Entertainment Training

There are several training options available to help you be more creative and productive with your application, including free self-paced training and instructor-led training.

For all your training options, see: *http://www.autodesk.com/me_training*.

Notation Conventions

A number of style conventions are used throughout your documentation. These conventions and examples of their use are shown as follows.

Convention	Example
Text that you enter in a command line or shell appears in Courier bold. Press the Enter key after each command.	**`install rpm -qa`**
Variable names appear in Courier, enclosed in angle brackets.	`<filename>`
Feedback from the command line or shell appears in Courier.	`limit coredumpsize`
Directory names, filenames, URLs, and command line utilities appear in italics.	*/usr/discreet*

Contacting Customer Support

For Autodesk Media and Entertainment Customer Support, visit *http://www.autodesk.com/support*.

Customer support is also available through your Autodesk reseller. To find a reseller near you, consult the reseller look-up database at *http://www.autodesk.com/resellers*.

What's New

2

Topics in this chapter:

About This Release

The release of Autodesk® Lustre® 2010 introduces many new and updated creative tools, as well as workflow improvements. See the themes below for a quick overview, and then follow the links for more detailed information.

Enhanced Grade Bin

Certain enhancements were made to the Grade bin feature to improve the way grades are organized, stored, and copied and pasted to shots. The enhancements are as follows:

- Within the Project and User settings, you can designate the path for project and user Grade bins.
- Within the *init.config* file, you can set the location of your grades for the Global Grade bin.
- In the Grade bin, you can organize the grades within the existing Grade bin by holding down the **Alt** key while dragging and dropping the grade to a different storage container.
- The expanded Grade bin is a new feature in Lustre. Within this view, you can view the grades in a list, view the details, or view the grade proxies (similar to viewing the shots within the Shot bin). You can also choose to see the expanded Grade bin that occupies the entire Player, or view that displays the grades in the left window and a preview of the selected grade in the right window. The expanded Grade bin also allows you to have easier access to copy, delete, sort, and move your grades. See Using the Expanded Grade Bin on page 13.
- In the expanded Grade bin, you can organize the grades within the existing Grade bin. For example, you can drag and drop grades from one bin to another, reorder the grades, and create a new folder to store your grades.
- You can drag and drop grades from the Grade bin or the expanded Grade bin to the Storyboard or timeline, and you can copy grades from the expanded Grade bin to the existing Grade bin, and vice versa.
- When using BrowseD, you can browse grades that are located on another workstation.
- The Quick folder option gives you easy access to a selected folder of grade files. Within the file browser, locate the grade folder that you would like access with a single click. Select the folder and press Set Quick Folder. From now on, when you click Quick, you will automatically navigate to the grades folder you have selected.

  NOTE Only one quick folder can be set for each user on each project.

- You can use the **Shift+-** hotkey to cycle between Grade bin locations.

Compressed Media Support

Lustre 2010 introduces new options to the transcode feature. Within the Format settings tab, the following additions include the ability to:

- Load the RED™ media camera or the RSX file settings.
- Toggle between the transcoded and the original RED media.
- Copy the Selector transcode parameters from one shot to another.

For a full description of the new options, see Transcode Format Settings on page 27.

Other additions to this feature include:

- The ability to browse to the location of the Transcoded Media Home directory.
- The Settings and Transcode options are now available in the Format, Colour, and Output settings tabs.
- The codec information for compressed media is now visible when you are viewing the file metadata within the file browser.
- Audio media from QuickTime and MXF files is now supported.

Degrain

The new degrain feature allows you to remove grain and noise from your shot. The Degrain menu can be found within the Image or Colour main menu. See Removing Grain on page 31.

This feature allows you to do the following:

- Analyze the grain for the entire frame or a selected region within the frame. You can remove grain from the original image or use a secondary to define an area of the original image that you want to degrain.
- After you have analyzed the frame, you can apply a degrain filter to the shot.
- You can adjust the grain removal using the options within the Temporal Options, Degrain Settings, and Curve Editor panels.

- You can cache the filtered frames created using the CPU, and play back the result in both CPU processing and GPU acceleration mode. (If any parameters are changed, GPU acceleration must be disabled and images must be reanalysed in CPU mode to update and recache the frames.)
- The grain profile and options can be copied from one shot to another using the degrain parameters within the Selector.
- Grain profiles can be saved as a Preset.

48 Secondary Layers

The secondary layers have increased from 12 to 48. Below the secondary layer buttons are the secondary layer page buttons. There are four pages of 12 secondary layers. You can select a page to view its corresponding secondaries. See Secondary Layers on page 43. The secondary layers panel is also accessible from the Autodesk control surface. See Adding Secondary Layers on page 46.

Wiretap Interoperability

The following is the list of the new and improved interoperability features between Lustre and the Visual Effects and Finishing applications:

- You now have the ability to import a multi-layer timeline from a Visual Effects and Finishing application and export it to the Wiretap server.
- When gaps are imported from a multi-layer timeline, they are seen as black media for Layer 1 and appear transparent for the layers above Layer 1.
- Marry grade files can be created with content coming from the Wiretap server (soft import/publish only). Content that is located on the Stone FS or Standard FS is still not supported. The workaround for this is to publish the content to a shared location.
- Lustre now supports a timeline with a mix of media that has drop frame and non-drop frame. Instead of using only the timeline frame code mode, it now also uses the source clips' frame code mode.
- Previously, when you imported media with dissolves from a Visual Effects and Finishing application, the dissolves were all shown as centre dissolves within Lustre. Now when footage from a Visual Effects and Finishing application is imported into Lustre, the dissolves are shown accordingly

(i.e., from cut, centre, up to cut, or custom). This feature is supported by Wiretap Server 2010 and higher.

- A cut is now created with the Wiretap frame rate data and frame code mode (drop frame and non-drop frame).
- Within the Network Rendering settings of the project configuration, you can now enable the Proxy Rendering option, so that proxies are automatically generated when you render the timeline. This allows you to load clips in a Visual Effects and Finishing application without having to render the proxies first.
- The library reel, source clip, and timeline clip names are new metadata that are created when you render to Wiretap.

Other Enhancements

Within the Storyboard view, you can drag and drop the grading from one shot to another.

To drag and drop the grade from one shot to another, do one of the following:

- Hold down **Ctrl**+**Shift**, and drag and drop to copy grades to multiple destinations.
- Hold down **Ctrl**+**Alt**, and drag and drop to use the Selector to copy grades to a single destination.
- Hold down **Ctrl**+**Shift**+**Alt**, and drag and drop to use the Selector to copy grades to multiple destinations.

Lustre User Interface

The following is a list of changes to the Lustre user interface:

- The Autokey (AutoK) button is now yellow when it is enabled.
- In the Colour > Curves menu, you can now easily select the top-right curve handle.

Project Management

The following is a list of changes made to project management:

- When you create a new project, a default scene is automatically created.
- When you create a new project that uses an existing project home folder, the first scene (in numerical or alphabetical order) is the default scene.
- The state of the Storyboard is now saved when you exit Lustre.

Real-Time Deliverables (RTD)

The following are the changes made to the RTD feature:

- Select Custom in the Method options of the Image > Reposition menu to remove visible patterns on the DPX file.
- You can use the Selector to copy the Method option parameters.
- You can set the default resize file for Real-Time Deliverables in the *init.config* file.

```
<Miscellaneous>
< DefaultDeliverablePanScanFilter enum=”Fast”/>
</Miscellaneous>
```

You can select one of the following settings.

Enter:	For:
Fast	Lanczos2
Quality	Lanczos2
Custom	Spline filter (blurs the image and eliminates the resize pattern)

Hotkeys

The following is a list of the new or updated hotkeys.

Press:	To:
Y	Enable/disable GPU acceleration.

Press:	To:
Alt+A	Enable/disable Autokey.
Right-click an option box	Scroll through the options in reverse order.
Shift+drag	Rapidly increase/decrease the slider or colour wheel value.
Alt+drag	Slowly increase/decrease the slider or colour wheel value.

Autodesk Control Surface (ACS)

The following is a list of additional functionality that has been added to the ACS panel:

- Press **Alt**+**Enter** (on the Navigation panel) to toggle the state of the Autokey. When Autokey is enabled, the state appears in the digital display of the Colour Grading panel.
- Press +/- (on the Navigation panel) to toggle the expanded Grade bin view when you are in the Grade bin feature.
- On the Lustre Station, the undo list and the Storyboard thumbnails are updated when you press the DO button on the Navigation panel.
- The state of Autokey appears on the digital display of the Colour Grading panel.

Other Changes

The following is a list of the additional changes for Lustre:

- The values of the sliders and colour wheels, located in the Colour > Grading menu and the Image > CDL menu, can now exceed their range when you are using the mouse or pen to drag within the user interface.
- Multi-layered timelines are now supported with the change cut option. If the destination of the cut contains multiple layers, the grading from all the layers is used for matching. If not, then only the top-most layer, soloed layer, or priority elements are used.
- Curves are now supported on the Lustre Station

Enhanced Grade Bin

3

Topics in this chapter:

Using the Expanded Grade Bin

Use the expanded Grade bin to locate and display grade files. You can manage grade files at the global, project, scene, or user level. You can also define a custom folder and bookmark it for quick access.

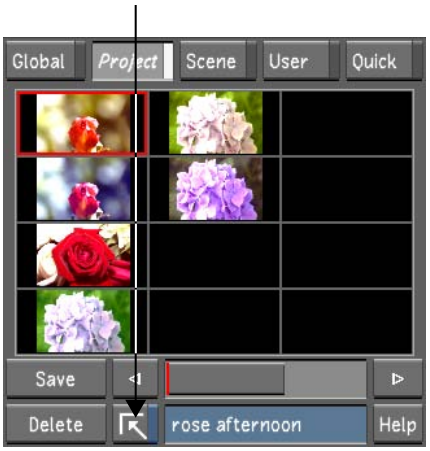
In addition to move, copy, and delete operations, you can create new folders, enable a player to view grades and shots, and work in different views to view grade files.

Accessing the File Browser

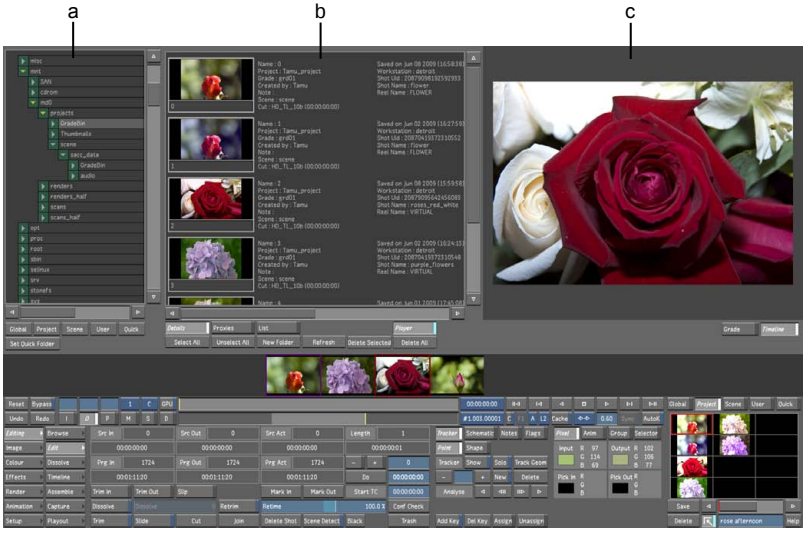
Use the file browser to locate grade data and load it into the Grade bin.

To access the file browser:

➤ In the Grade bin, click the Expand button.



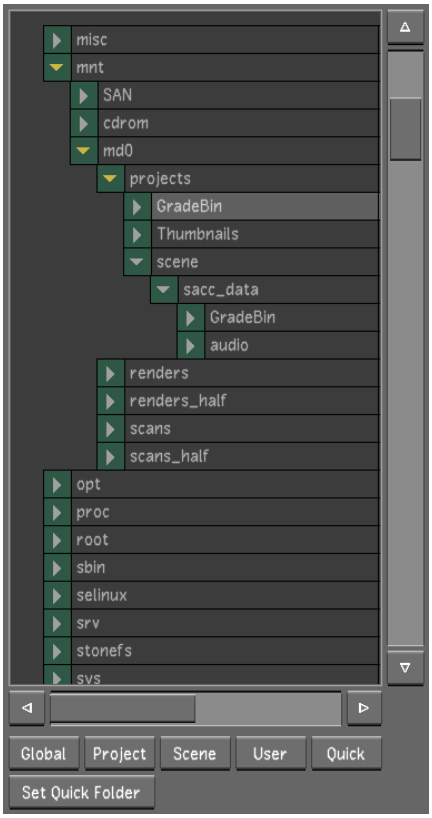
The Grade view appears.



(a) File browser (b) Expanded Grade bin (c) Player

When you are in the Grade view, the work area is divided into multiple areas.

File browser Use to locate grade data and display it in the expanded Grade bin. In the file browser, you can see if there are Grade bin folders at the user, scene, project, or global level.

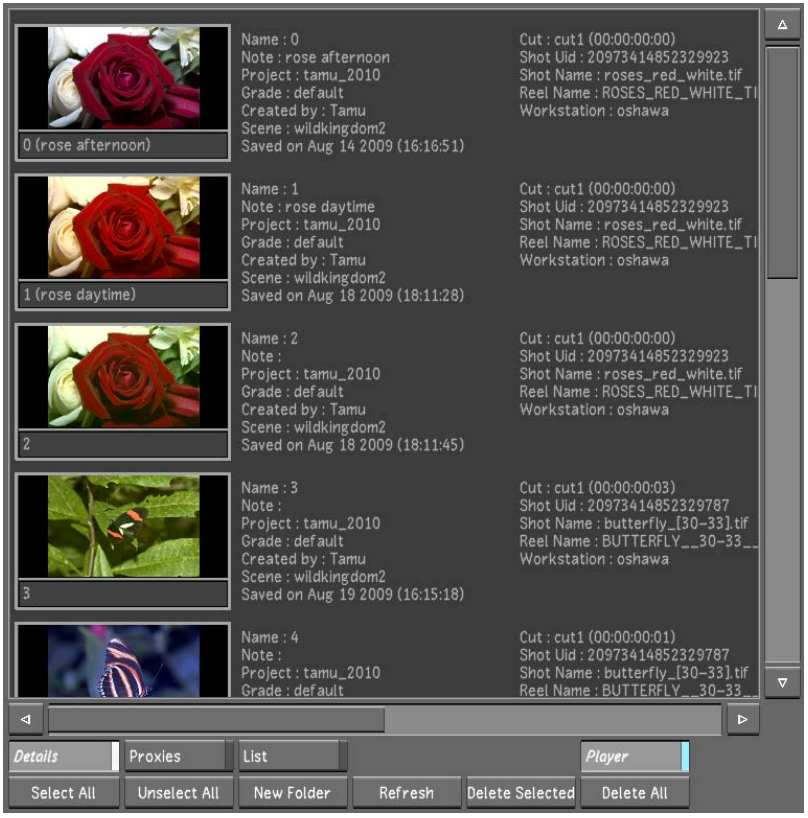


Click:	To:
Global	Display the location of the global Grade bin folder and its contents.
Project	Display the location of the project Grade bin folder and its contents.
Scene	Display the location of the scene Grade bin folder and its contents.
User	Display the location of the user Grade bin folder and its contents.
Quick	Display the location of a pre-defined Grade bin folder and its contents.

Click:	To:
Set Quick Folder	Store the file path of the currently selected Grade bin folder. See Defining the Quick Folder on page 18.

TIP Place the cursor over the file browser or expanded Grade bin, and press **Shift**+- to cycle through the display of different expanded Grade bins.

Expanded Grade bin Use to display and organize the grade files.



Click:	To:
Details	Display grade files in Thumbnail and Text view. Traditional methods of multi-selecting (**Shift**-click, **Ctrl**-click) are enabled.
Proxies	Display grade files in Thumbnail view. Traditional methods of multi-selecting (**Shift**-click, **Ctrl**-click) are enabled.

Click:	To:
List	Display grade files in Text view.
Player	Display the contents of the expanded Grade bin and the Player. Disable button to display the expanded Grade bin only. Press **Q** to alternate the display between a large Storyboard view and the Player.
Select All	Select all grade files in the expanded Grade bin.
Unselect All	Deselect the selected grade files in the expanded Grade bin.
New Folder	Create a new folder under the currently selected folder. Enter a new name. Rename the folder at any time by right-clicking it and entering a new name (the global, scene, project, and user directories, cannot be renamed).
Refresh	Rescan the file systems and update the file browser and expanded Grade bin with up-to-date information.
Delete Selected	Delete selected grade files.
Delete All	Delete all grade files from the expanded Grade bin.

Player Use to display selected shots and grade files. Enable the Player button to display the Player.

Click:	To:
Grade	Display the current grade selected in the expanded Grade bin.
Timeline	Display the current shot selected in the Timeline or Storyboard.

Defining the Quick Folder

You can use the file browser to select any folder and define it as a location in which you want to store grade files. Once you have stored the location of this folder, you can quickly display and select it in the file browser, and use the Quick buttons to display its contents in the Grade bin and expanded Grade bin.

To set the Quick folder:

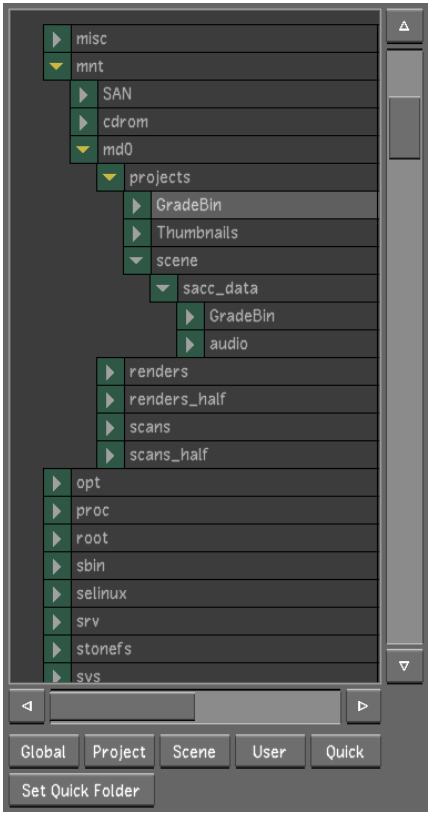
1. Navigate to the folder you want to set as your Quick folder.
2. Click the name of the folder to select it.
3. Click Set Quick Folder.

Loading Grade Files from the Expanded Grade Bin

Once you locate your Grade bin folder in the file browser and display its contents in the expanded Grade bin, you can move grade files into the Grade bin storage containers. Grade files in the expanded Grade bin are pointers to the actual files on the file system. You can view information about the grade files in expanded Grade bin.

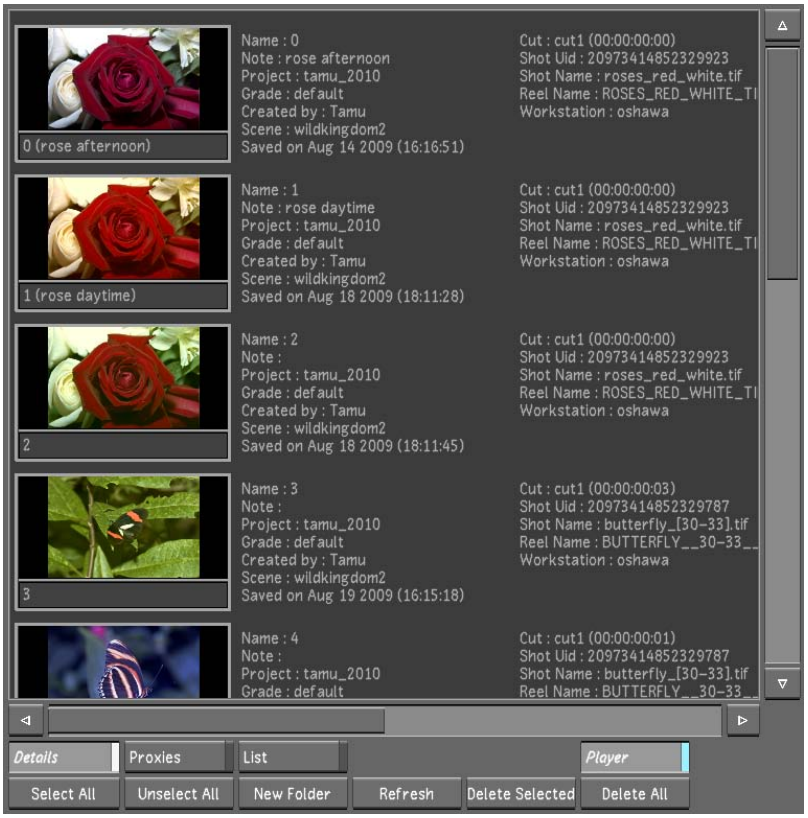
To load grade files from the expanded Grade bin to a Grade bin storage container:

1 Locate your grade files. Expand a folder by clicking the arrow to the left of the folder name, and then navigate to the appropriate folder.



NOTE You can open all of a folder's sub-directories by **Shift**-clicking the arrow to the left of the folder.

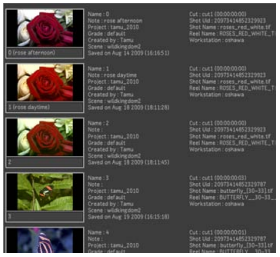
The available grade files appear in the expanded Grade bin with information about their contents.



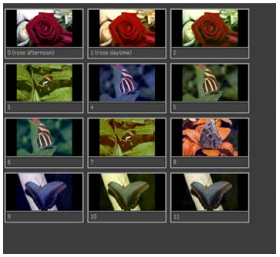
2 Use the following expanded Grade bin buttons to switch between Grade bin view modes.

Click:	**To:**
Details	Display grade files as thumbnails with accompanying detail text.
Proxies	Display grade files as proxy thumbnails.

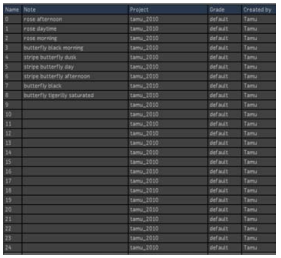
Click:	To:
List	Display grade files in text format only.



Details



Proxies



List

3 Do one of the following:

- In the Proxies or Details view, click the grade file.
- In the List view, click the Name column of the grade file.

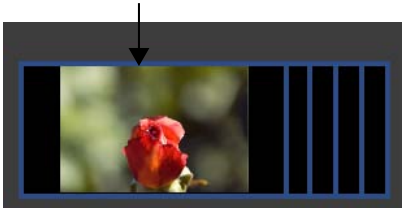
> **NOTE** To copy a grade file from one destination to another, press **Ctrl** as you drag files from the source Grade bin.

The cursor picks up the grade file.

If you pick up the wrong grade files, click any unused grey area outside the expanded Grade bin to cancel your selection of grade files.

Each time you click a grade file, the cursor picks it up. If you click more than one grade file, the cursor picks them all up.

> **TIP** To select all the grade files from a folder, click the Select All button.



4 Drag the selected grade files to the Grade bin storage container, and then click to release the files.

TIP You can drag grade files directly from the expanded Grade bin to a shot in the Storyboard. See Applying Grade Files to Shots in a Cut on page 22.

Moving Grade Files Between Grade Bins

In addition to moving grade files from the expanded Grade bin to a storage container, you can use drag-and-drop operations to move and copy between the expanded Grade bin, Grade bin storage containers, and file browser.

NOTE To copy a grade file from one location to another, hold down **Ctrl** as you drag files from the source Grade bin to its destination.

Drag from:	Drop in:
Expanded Grade bin	■ A folder in the file browser ■ A Grade bin storage container
Grade bin storage container	■ Another Grade bin storage container ■ An expanded Grade bin ■ A folder in the file browser
File browser	Illegal operation: Using a drag-and-drop operation, the file browser can only have a grade file moved or copied to it.

Applying Grade Files to Shots in a Cut

You can select grade files in the expanded Grade bin and apply them to a shot in the Storyboard or Timeline to grade the shot.

To apply grade files from the expanded Grade bin to a shot:

1 Do one of the following:

- In the Proxies or Details view, click the grade file.
- In the List view, click the grade name.

The cursor picks up the grade file. If you click more than one grade file, only the first grade file will be applied.

2 Move the cursor to the Storyboard or Timeline.

If the shot is moved to the Storyboard, an orange highlight appears around the selected shot.

3 Click to drop the grade file on the shot.

TIP Double-click an unused storage container in the Grade bin to reset selected shots to their default settings.

Deleting Grades From the Expanded Grade Bin

You can delete all or selected grade files from the expanded Grade bin.

NOTE Deleting grade files from the expanded Grade bin does not delete grade data from the Storyboard.

To delete selected grade files from the expanded Grade bin:

1 Select the grade files you want to delete by doing one of the following:

- Click Select All in the expanded Grade bin.
  All the grade files are selected.
- Press **Ctrl** and click the name on the thumbnail of the grade file.
  Only the grade files you choose are selected.

2 Click Delete Selected, and then confirm the action.

All the selected grade files are deleted.

To delete all grade files from the expanded Grade bin:

➤ Click Delete All, and then confirm the action.
All the grade files are deleted.

Viewing Media File Information

When you view grade files in the expanded Grade bin, you can display information about the media files.

Details view

Name	Note	Project	Grade	Created by
0	rose afternoon	tamu_2010	default	Tamu
1	rose daytime	tamu_2010	default	Tamu
2	rose morning	tamu_2010	default	Tamu
3	butterfly black morning	tamu_2010	default	Tamu
4	stripe butterfly dusk	tamu_2010	default	Tamu
5	stripe butterfly day	tamu_2010	default	Tamu

List view

NOTE Text information is not displayed in Thumbnail view.

Name Displays the name of the grade file.

Note Displays any notes saved with the grade. Right-click to edit the note.

Project Indicates the project in which the grade was created.

Scene Indicates the original scene in which the grade was created.

Grade Indicates the original grade in which the grade file was created.

Cut Indicates the original cut in which the grade was created.

Created by Indicates the user that created the grade.

Saved on Displays the date on which the grade was saved.

Shot UId Displays the shot's unique ID.

Shot Name Displays the name of the shot saved with the grade.

Reel Name Displays the name of the source reel on which the shot is saved.

Workstation Displays the workstation on which the grade was created.

To sort List view information:

➤ Do one of the following:

- Click a column header to sort the list in ascending order by selected column. Re-click the column to sort the list in descending order.
- Press **Ctrl** and click any column header to reset the sort order by name.

Loading Grading Presets

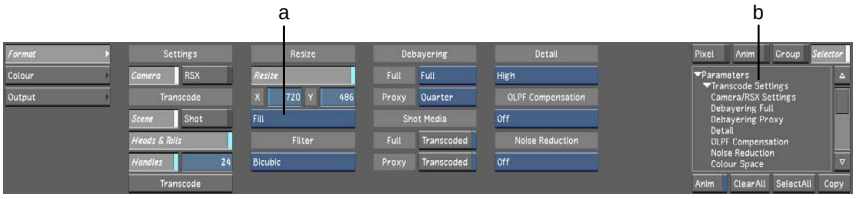
You can select which grading information you load from a grade file in the expanded Grade bin using preset lists.

Compressed Media

4

Topics in this chapter:

Transcode Format Settings



(a) Fit Method option box (b) Transcode Settings parameters

NOTE The Settings and Transcode panel options are also available in the Colour and Output settings tab.

Camera button Enable to load the original RED media values as set by the RED camera. When the RED media is initially imported, this button is automatically enabled. When you change one of the transcode options, this button is automatically disabled to show that these settings are no longer the original RED camera settings.

RSX button Enable to load the values from the latest version of the RSX file. When a clip is opened in RED ALERT!™, an RSX file is saved alongside the R3D file, using the same filename. It contains the additional metadata added to the R3D file within RED ALERT!.

Once you change one of the Lustre transcode options, this button is automatically disabled to show that these settings are no longer the original RSX file settings.

Scene button/Shot button Enable Scene or Shot to transcode either the entire scene or the shot that is selected in the Storyboard.

Heads & Tails button Enable to make sure the heads and tails from the RED media are kept when it is transcoded.

Handles button and Handles field Enable the Handles button when you want to transcode fewer heads and tails than what is currently showing in the footage. Enter a value in the Handles field to determine how many heads and tails to transcode. This option can only be used if the Heads & Tails option is enabled.

Transcode button When the format, colour, and output settings have been established, click this button to send the job to the Backburner Manager and transcode the RED media to a DPX file.

Resize button When enabled, the resize settings (i.e., the X and Y fields) are implemented when the RED media is transcoded.

X/Y field Enter the desired resize setting. Note that a resize setting that is not directly proportional to the size of the original media takes longer to process.

Fit Method option box To use a different aspect ratio during a resize, select one of the following fit method options to be applied to the exported clip.

Select:	To:
Fill	Fit the source, width, and height into the destination frame. If the source and destination frames do not have the same aspect ratio, the image can become distorted. This is the default option.
Crop Edges	Fit one edge of the source into the destination frame without stretching or squashing the frame. Excess parts of the source frame after resizing are cropped. If the source, after the one edge is resized, is wider than the destination, its overhanging left and right edges are cropped. If the source is taller than the destination, the upper and lower edges are cropped.

Select:	To:
Letterbox	Fit the source to the destination frame without squashing or stretching it, and without cropping the source. If the source is wider than the destination, black bars fill the top and bottom of the destination frame. If the source is narrower than the destination, black bars fill the right and left sides of the frame. If the source is narrower than the destination, black bars fill the right and left sides of the frame. In all cases, the entire source frame is contained within the destination frame.
Centre/Crop	Fit the source image, centred, over the destination frame. If the source is larger than the destination, it is cropped. If the source is smaller than the destination, it is surrounded by a black border.

Filter option box Select the filter option to determine the quality of the interpolated resize result.

Select:	To get:
Bicubic	Very good results for resizing soft-looking images. Use to sharpen the image. This is the default option.
Mitchell	Best results when resizing a clip to a higher resolution.
Triangle	Moderate results with little processing overhead.
Impulse	Quick, low-quality results.
Lanczos	Best results when resizing a clip containing a variety of patterns and elements to a lower resolution. It is the most complex, with the longest processing time.
Shannon	Excellent results when resizing a clip to a lower resolution. Very similar to Lanczos, but results are a little softer.
Quadratic	Good results for resizing simple images with straight edges. Similar to Gaussian, but with more blurring. Use to soften the image.
Gaussian	Excellent results when resizing a clip with no patterns and a lot of straight edges to a lower resolution. Useful for softening some detail.

Debayering Full/Proxy option box Select the level of quality required from the debayering algorithm. Higher resolutions take more time to process. Select one of the following options for the full or proxy footage:

- Full
- Half Premium
- Half Good
- Quarter
- Eighth

Full/Proxy Transcoded button Enable to view the transcoded media and disable to view the original RED media. These buttons are automatically enabled once the footage has been transcoded. Whether the Full, Proxy, or both buttons are enabled depends on what is selected for the Media Creation Order option. For information about the Media Creation Order option, refer to "Transcode Output Settings" in the "Browsing for Footage" chapter of the *Lustre User Guide*.

Detail option box Select the level of detail extraction required. Your options are:

- Low
- Medium
- High

OLPF Compensation option box Select the level of Optical Low Pass Filter compensation to use. The OLPF is a type of sharpening used to compensate for the optical anti-aliasing filter, which can induce softening of the image during recording.

Noise Reduction option box Select the level of noise reduction applied to the debayered shot.

Transcode Settings parameters Select the parameters within the respective list to copy the settings from one shot to another. For information regarding the Selector, refer to "Copying Parameters with the Selector" in the "Basics" chapter of the *Lustre User Guide*.

Removing Grain

5

Topics in this chapter:

About Grain Removal

Use the Degrain tool in Lustre to remove film grain, video noise, and other compression noise from your shots while minimizing damage to the image. Grain removal can be done at any time during the project workflow, but it is typical to perform an initial degrain operation on the source image before primary colour grading begins.

A recommended grain removal workflow consists of the following basic steps. You can view the result as you work. See Viewing the Result on page 33.

Step:	Refer to:
1. Define the degrain cache location.	Project Settings and Rendering Settings in the Project Management chapter of the Autodesk *Lustre User Guide*.
2. Analyse the grain profile of the input image.	Analysing the Frame on page 32.
3. Perform post-analysis cleanup.	Post-Analysis Clean-Up on page 36.
4. Cache the filtered images.	Caching the Result on page 39.
5. Apply input and secondary grading.	Primary Colour Grading and Secondary Colour Grading chapters in the Autodesk **Lustre User Guide**.
6. (Optional) Analyse the grain profile of secondaries to degrain isolated parts of the image.	Removing Grain with Secondaries on page 42.
7. Render the result.	Rendering chapter in the Autodesk **Lustre User Guide**.

Analysing the Frame

Before processing the grain filter, the image must be analysed. Use the Grain Analysis panel to perform an analysis on a selected frame. The grain profile for the shot is recalculated each time an analysis is performed. If you navigate to a different frame in the shot and analyze it, the grain profile will be based on the new data.

NOTE It is recommended that you perform an analysis on the entire image, then analyse multiple regions of the image, if required.

To analyse the grain profile of an image:

1. Navigate to the frame you want to analyse.
2. Do one of the following:
   - If you want to degrain the entire image, click Degrain in the Image menu.
   - If you want to degrain a region of interest, click Degrain in the Colour menu.
3. (Optional) Enable the Sub-Region Analysis button and define an area to analyse. For best results, define multiple regions of uniform colour with no features. See Working with Sub-Region Boxes on page 34.
4. Click the Analyse button to determine the grain structure.

Viewing the Result

After the frame is analysed, you can view the result of applying the degrain filter on all or a portion (sub-region) of the image. For increased performance, it is recommended that you select the sub-region where you want to view the filtered result.

To apply the degrain filter:

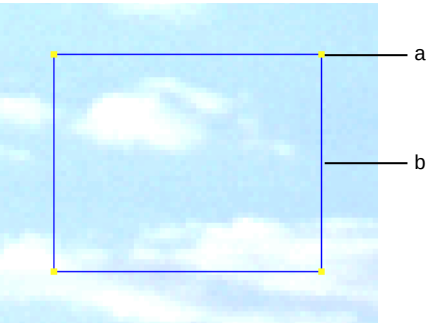
1. Navigate to the frame you want to view.
2. Do one of the following:
   - If you want to degrain the entire image, click Degrain in the Image menu.
   - If you want to degrain a region of interest, click Degrain in the Colour menu.
3. (Optional) Enable the Sub-Region Filtering button and drag to define an area to view with the result. See Working with Sub-Region Boxes on page 34.

NOTE Unlike sub-region analysis boxes, the sub-region filtering box cannot be deleted, only disabled.

4 Enable the Apply Degrain button to view the filter on the image.

Working with Sub-Region Boxes

To analyse specific regions of the image's grain structure, you need to use sub-region analysis boxes. If you are not satisfied with an analysis of the entire image, you can use sub-regions to constrain the analysis to focus on regions of interest. You will probably need to adjust the position or size of some boxes, or delete them. Following are basic procedures for working with boxes.



(a) Vertex (b) Border

To create a box:

1 Enable Sub-Region Analysis.

2 Hold down the left mouse button and drag the cursor diagonally on the image.

3 Release the mouse button.

To select a box:

➤ Do one of the following:

- Click inside the box.
  The current box is active and all other sub-region analysis boxes are inactive.

- Right-click inside the box to change its state, without affecting the state of other sub-region analysis boxes.

The vertices of active boxes are yellow (selected). The vertices of inactive boxes are red (disabled).

To move a box:

➤ Click inside the box and drag it.

To re-size a box:

➤ Click on a vertex and drag.

To display or hide boxes:

➤ Press **Z**.

To delete one or more boxes:

NOTE The sub-region filtering box cannot be deleted, only disabled.

➤ Do one of the following:

- Press **Backspace** to delete all active boxes.
- Using the Delete Boxes panel, do one of the following.

Click:	To delete:
Active	The currently selected box (highlighted in yellow).
Frame	All boxes on the current frame, whether active or not.
Shot	All boxes on all frames in the current shot.

Locating Sub-Region Analysis Boxes Within a Shot

Use the navigation buttons in the Reference panel to easily locate and navigate between shots that use sub-region boxes for degrain analysis.

To navigate between sub-region analysis boxes:

➤ Click a button in the Reference panel.

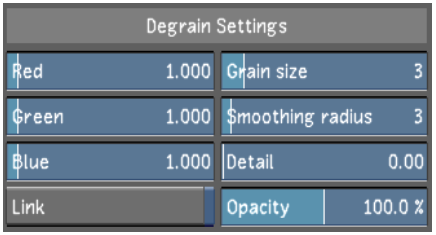
Click:	To display:
	The first frame in the shot that has a sub-region box.
	The previous frame in the shot that has a sub-region box.
	The reference frame on which the most recent analysis was performed.
	The next frame in the shot that has a sub-region box.
	The last frame in the shot that has a sub-region box.

Post-Analysis Clean-Up

Once you have analysed the grain profile, you can make adjustments to the profile. You can adjust spatial degrain parameters, or apply a temporal degrain that can include previous or subsequent frames in the shot. A curve is displayed for each colour channel. You can manually adjust a response curve for the gain of each colour channel in the Curve Editor.

Adjusting Spatial Degrain Settings

You can fine-tune grain removal by changing the spatial degrain parameters in the Degrain Settings panel.



The Degrain Settings menu is made up of the following elements.

Red slider Sets the gain for red channel colour values.

Green slider Sets the gain for green channel colour values.

Blue slider Sets the gain for blue channel colour values. For film scans, the grain is often greater in this channel.

Link button Click to change gain values proportionally for all three colour channels.

Grain Size slider Sets a value in pixels that is proportional to the size of the grain. The default value is 3, but may be higher for 4K images.

Smoothing Radius slider Sets the blur radius. For smoother results, a higher value will add more pixels to the blur, but increase processing time.

Detail slider Sets the amount of detail to preserve when the Smoothing Radius is set to a high value. It is recommended you enter 0.05 to 0.15 as an initial value.

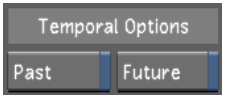
Opacity slider Sets the level of opacity between the source image and the output with the applied grain filter.

Applying Temporal Degrain Settings

If you degrain the source image (using the Degrain menu in the Input menu), you can include temporal degrain operations to the grain filter, by comparing the pixel data in past or future frames. These options yield best results when frames include many static or slowly moving objects in the image. Temporal options will improve grain removal results, but it will also increase processing time.

NOTE When temporal options are used on cached images, the result must be re-cached.

NOTE Incinerator does not process temporal degrain. Render to view these results.



To use temporal degrain:

➤ In the Temporal Options panel, enable one or both states.

Enable:	To include pixel data from:
Past	Previous frames in temporal processing.
Future	Subsequent frames in temporal processing.

Adjusting the Response Curves

Response curves represent the noise intensity for each colour channel. Modify the red, green, or blue response curves to fine-tune the degrain. You can add vertices to a curve to refine your adjustments.

To modify the red, green, or blue curve:

1. To display the response curve, click Show Curves.
2. Show the response curve you want to modify by clicking the button corresponding to the colour of the curve.

   The selected curve is highlighted.
3. Sample the colour you want to use as a reference for your adjustments.

   Red, green, and blue vertical lines representing the colour channels are plotted on the curve.
4. Do one of the following:
   - To add a vertex to the curve, place the mouse cursor over the area on the curve where you want to add the vertex and press **A**.
   - To lock the curve in place while adding a vertex, press **Shift+A** on the curve.
5. Click a vertex to display its tangent handle and then drag the handle to adjust the curve. You can also adjust the curve by dragging the vertex.
6. Modify the curve until you are satisfied with the results:
   - To select a vertex, click it. To select several vertices, draw a selection box around them.
   - To move one or several selected vertices, drag a selected vertex. To restrict vertex movement to the Y axis, press **Shift** while moving the

mouse. To restrict vertex movement to the X axis, press **Shift+Alt** while moving the mouse.

- To delete vertices, select them and then press **D**.

Caching the Result

Degrain operations use caching of input images to manage the intensive processing requirements imposed on Lustre. If the Apply Degrain button is enabled, a degrained shot is automatically cached when the shot is initially played back after a Degrain operation. You can also use the Slave Renderer and Burn to cache frames. See Caching Frames Remotely on page 40.

The Degrain menu does not have to be visible for Lustre to continue caching frames.

You can cache the filtered frames created using the CPU. Once cached, Lustre can recall cached frames during future playback in both CPU processing and GPU acceleration mode. (If any parameters are changed, GPU acceleration must be disabled and images must be reanalysed in CPU mode to update and re-cache the frames.)

When configuring your project in Lustre, you also define the location of cached frames using the project settings. Degrained frames can be cached in a sub-directory of the Scans folder or a user-defined degrain cache file location.

Only one instance of a frame can be cached in a shot, even if it is used in multiple cuts. If the cached media is saved as a preset, then you can load the cached media into the shot in a different cut. See Saving and Loading Degrain Presets on page 42.

Caching Frames from Wiretap

You can cache frames from media imported from Wiretap and Wiretap Gateway. Cached frames are saved in the user-defined location set in the Degrain Cache field found in Project settings. Media is saved in this location even if, in the Rendering menu, the Degrain File Location option box is set to Save with Scan.

Media that is soft-imported from Wiretap use source files that can be accessed using a file path structure, rather than a Wiretap or Wiretap Gateway address. As a result, soft-imported frames can be saved in Scans Home or the user-defined degrain cache location.

Caching Frames Remotely

You can use a Slave Rendering machine to cache frames in the background as you work, or Burn to submit a caching job.

NOTE Degrained frames cannot be cached using Incinerator.

If you want to cache remotely to a user-defined location, you must enter a BrowseD file path in the Degrain Cache field. For example, in Linux, a valid BrowseD file path can have the following structure: *<IP address>:/mnt/storage/<project_name>*. In Windows, it can be *<IP address>:\F:\storage\<project_name>*.

In Linux, to cache remotely using absolute file paths for a user-defined degrain cache location, you must create a shared NFS mount point on the Slave Renderer or Burn. In Windows, you use a UNC path for the Windows Slave Rendering machine, or use a Samba path to create a mount point on a Burn node.

To perform background caching using the Slave Renderer:

1. Display the SlaveRender menu.
2. In the SlaveRender panel, toggle the On/Off button to On.
3. In the Degrain Only panel, toggle the On/Off button to On.

   When the Apply Degrain button is enabled in the Degrain menu, degrained frames are cached after you navigate to another shot.

NOTE To render degrained frames using the Slave Renderer, set the Degrain Only panel On/Off button to Off. Graded frames with Degrain will be rendered in the Renders Full Home destination.

To cache using a Burn node:

1. Display the Backburner menu.
2. Enable the Degrain Only button.
3. Click Burn.

   When the Apply Degrain button is enabled in the Degrain menu, the degrained frames are cached.

NOTE To render degrained frames using a Burn node, disable the Degrain Only button. Graded frames with Degrain will be rendered in the Renders Full Home destination.

Clearing the Cache

You can clear the cached frames for the current shot or clear the *degrain_cache* folder for the entire cut. The files that will be removed are dependent upon where you choose to save your files.

When degrain cache frames are saved in the Scans directory, the cache for the current shot in the Scans directory can be cleared. When degrain cache frames are saved in a user-defined location, all files stored at that location will be removed.

To clear the cache for the current shot:

NOTE This operation only applies when degrain cache files are saved in the Scans directory.

1. In the Rendering menu of the project configuration settings, set the Degrain Cache File Location option box to Saved with Scan.
2. In the Image menu, click Degrain.
3. Navigate to the shot with the frames you want to clear.
4. Click Clear Cache.

To clear the cache for the project:

NOTE This operation only applies when degrain cache files are saved in a user-defined location.

WARNING Lustre will delete all files stored in the user-defined location. This includes all degrained frames stored in this location for the entire project, even if it includes files from a different scene. It is strongly recommended that you store cached frames for different projects separately.

1. In the Rendering menu of the project configuration settings, set the Degrain Cache File Location option box to Saved with Degrain.

2 Do one of the following:
   - In the Image menu, click Degrain.
   - In the Project settings menu, click Rendering.
3 Click Clear Cache.

Removing Grain with Secondaries

After you have applied degrain operations to the input image, you can isolate parts of the image to degrain using secondaries. Degrain operations are cumulative: after initial noise removal, multiple passes using secondaries on the same area will be added to the final result.

When applying a degrain filter to a secondary layer, you cannot use temporal options and cache degrained frames.

To degrain a secondary layer:

1 In the Colour menu, click Degrain.
2 Select a secondary layer.
3 (Optional) Add a geometry to constrain the area of degrain analysis and filtering.
4 Click Analyse.
5 To view results, click Apply Degrain.

Copying Degrain Information

You can copy all or a selection of the Degrain menu parameters from a shot using the Selector. These parameters include the option to have degrain enabled or disabled on the destination shots.

Saving and Loading Degrain Presets

Once you create a grain profile, you can save it as a preset and reload it for later use or in other shots. A preset saved for an input image can be loaded on a secondary, and vice versa.

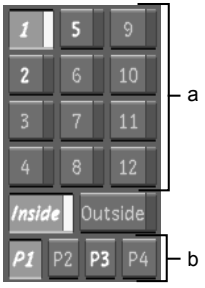
Secondary Colour Grading

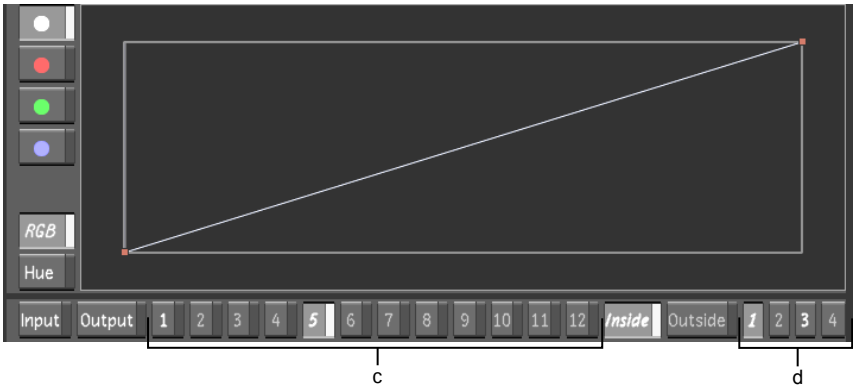
6

Topics in this chapter:

Secondary Layers

The secondary layers panel allows you to create up to 48 secondaries to be applied to each shot in your project. Once a secondary layer is selected, you can choose whether or not to apply the grading changes to the shot.





(a) Secondary layers (b) Secondary layer pages (c) Secondary layers within the F7 mode (d) Secondary layer pages within the F7 mode

Secondary Layer buttons There are 48 secondary layers that can be used to contain your secondary grading information. When a layer is selected, you are able to modify the grading applied to that layer. When a layer is activated, the grading is applied to the shot and is visible within the Player. Only one layer can be selected for editing at one time, but you can activate up to 48 layers at one time. There are 12 secondary layers on each page and there are four pages of secondary layers.

Inside button When selected, the secondary grading is applied inside the geometry. This is the default. In order to view the grading, make sure the button is activated (i.e., the text is white). If not, right-click the button to activate it. Refer to "Colour Grading Inside and Outside Secondaries" in the "Secondary Colour Grading" chapter in the *Lustre User Guide*.

Outside button When selected, the secondary grading is applied outside of the geometry. In order to view the grading, make sure the button is activated (i.e., the text is white). If not, right-click the button to activate it. Refer to "Colour Grading Inside and Outside Secondaries" in the "Secondary Colour Grading" chapter in the *Lustre User Guide*.

Secondary Layer Page buttons When a page is selected, it displays the 12 secondary layers associated with that page (e.g. P1 displays layers 1-12, P2 displays layers 13-24, etc.). If a page number is highlighted but not selected, it lets you know that there are active secondary layers on that page.

Secondary Layer Hotkeys

The following is a list of the secondary layer hotkeys. Refer to the *Autodesk Control Surface User Guide* for a list of the control panel hotkeys. These hotkeys can be used wherever the secondary layer panel is visible on the user interface.

NOTE These hotkeys cannot be used with the secondary option within the Effects menu.

Press:	To:
1 to 0, -, =	Select a secondary layer (1-12, 13-24, 25-36, or 37-48).
\	Activate/deactivate the selected secondary layer.
Ctrl+(1, 2, 3, or 4)	Select the secondary layers page 1, 2, 3, or 4.
Scroll Lock	Cycle through all the activated secondary layers.
Ctrl-click secondary layer button	Copy the grading information from the current menu (e.g., Grading, Curves, or Secondaries) to the selected secondary layer.
Shift-click secondary layer button	Copy all the colour grading information to the selected secondary layer.

Selecting and Activating Secondary Layers

When a secondary layer is selected, you can edit that layer. You can then toggle the activation of the secondary layer and view the results in the Player. Only one layer can be selected at a time for editing, but up to 48 layers can be activated and displayed within the Player.

To select and activate a secondary layer:

1 Click the layer number button. The grey bar on the side changes colour to show that a layer has been selected.

NOTE Click on another layer number to select another layer to edit.

2 Right-click the selected layer number to activate it. The number on the secondary button becomes white and all the changes applied to that layer are now visible within the Player.

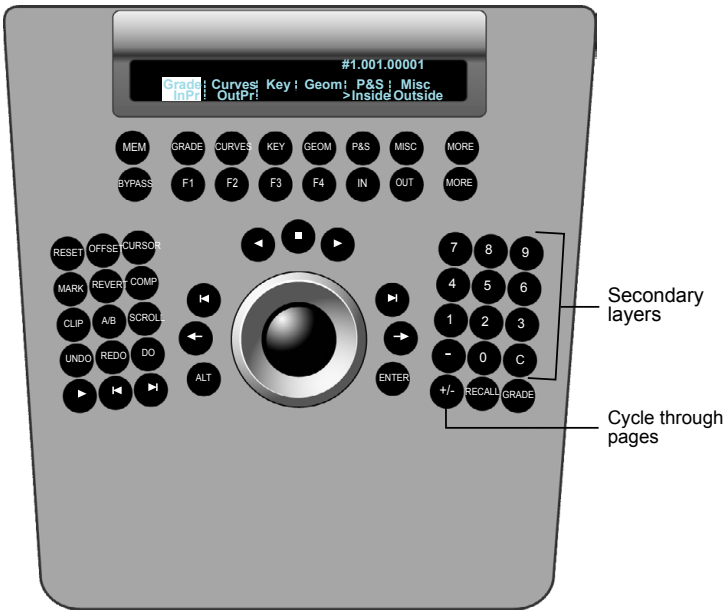
To deactivate the layer, right-click the layer number button again. The number on the secondary button goes from white to grey to indicate that it is no longer activated. The layer is then bypassed in the processing pipeline.

NOTE If you do not activate the layer, you can manipulate the geometry while keeping the colour correction hidden.

(a) Selected and activated secondary layer (b) Activated and unselected secondary layer (c) Current secondary layer page with activated layer(s) (d) Secondary layer page with activated layer(s)

Adding Secondary Layers

Secondary layers are used to colour grade specific hues and areas within an image. You can create up to 48 secondary layers for each shot within your project. Secondary layers can be added to your shot by accessing the numerical buttons on the Navigation panel. You can add layers to your shot from the Grade, Curves, Key, or Geometry menu. Once a secondary layer has been created, it can be modified by generating keys and geometries, removing grain, or by adding Lustre Sparks Effects.



Press:	To:
0-9, -, or C	Select, activate, or deactivate a layer. The buttons on the Navigation panel correspond to the position of the secondary layer on the user interface, and not to the actual numbers. For example, press 7 for layer 1. Press the button once to select a layer. Press the button twice to activate/deactivate a layer.
+/-	Cycle through the four pages of secondary layers. Each page consists of 12 secondary layers (e.g., P1 displays layers 1-12, P2 displays layers 13-24, etc.).