

Creative Grading

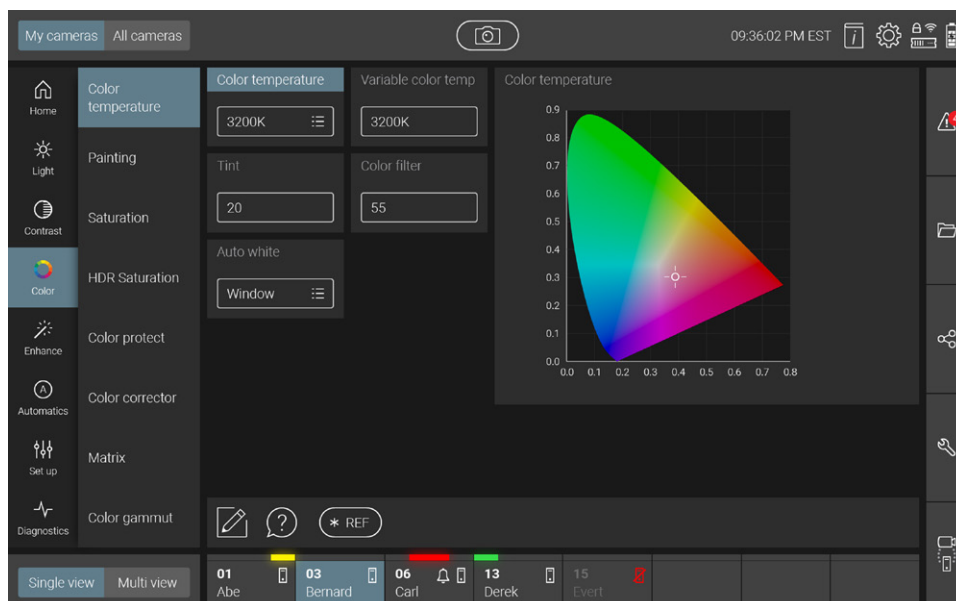
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The capture of high-quality camera images during live conditions can be very demanding. Whether indoors or out, the difficulties of adapting to the limitations of natural or artificial lighting and responding to rapid lighting changes are compounded by the artistic choices of a camera look, matching ambient or branded coloring, producing in multiple video formats, and of course satisfying unpredictable customer expectations — all under high-pressure time constraints.

Over time, meeting the creative demands on professional cameras has evolved a high-performance feature set with so many possible parameter adjustments that it's hard for professionals to keep up with the possibilities. Currently, every camera control panel in the industry is a flattened representation of the internal architecture of a camera with stacks of possible parameter adjustments in multilayered menus, which isn't fast or intuitive. Because even the best cameras rely heavily on the ability of the camera shader to maximize their performance, forcing shaders to sort through all the menus each time a change in lighting or look is required means that cameras are not being used to their full creative potential. A recent study showed that only about one-tenth of the existing functionality of today's cameras is regularly used, frequently leading to suboptimal images.

With Grass Valley's new Creative Grading, the Focus and LDX camera series just unleashed their full potential. Creative Grading is a new camera shading control panel and tablet application that redefines the human interface and puts the user in full control of the creative power that lives inside Grass Valley cameras.

Using either or both a tablet and an intensively-tested new control panel, Creative Grading transforms camera shading from what was numeric on/off thinking to a holistic view of organic curves and color shaping. For ease in visualization, the larger UI of the tablet application provides a graphical representation of the impact of parameter changes. Artistic decision making is much simpler and faster as shaders can see how a single change affects related sets of parameters in a system-wide view of how the on-screen image will be modified. This keeps shaders in full control, regardless of the situation and provides the camera operator with the most optimal working conditions for the task.



Improve the On-Air Experience

The time pressure and complexity of control solutions nowadays mean a shader is rarely able to take a larger view of the creative possibilities available. That complexity also means that in a situation where a quick response is required, responses are slowed and it is easy to make mistakes.

Because Creative Grading presents the various camera parameters as logical bundles, shaders can get an instant overview of what is affecting the image, seeing at a single glance the effect of the Range Extender, Iris, Filters, Exposure, etc. — something that typically would require shuffling through multiple menus. Presented with graphical representations rather than difficult-to-interpret strings of numbers, shaders can respond quickly with confidence.

Prior to Creative Grading, shots that involved significant lighting changes, such as tracking from indoors to out, or from the stage to audience, generally meant cutting to a different camera. As the Creative Grading controls are responsive in real time, Shaders can now easily and seamlessly shift the same camera from one look to the next with a single hand on the control panel — even while on air. There is no staggered shift of the on-camera image as parameters are changed in a sequential fashion.

The Creative Grading control panel provides unmatched speed of operation. Any control that is needed for a certain production can be assigned to six freely programmable rotaries and two freely programmable push-buttons on

the panel. Two programmable rotaries, located on the joystick, mean that in addition to controlling Iris and Master Black, shaders can also add control for parameters such as Gain and Color Temperature, making it possible with just one hand to shade a camera going from indoor to outdoor without touching any menus and without any glitch in the image. A different set of parameters can be assigned to the rotaries for HDR operation. Regardless of the type of production, shaders always have direct access to any control that is needed, without taking their eyes off the screen to browse through menus.

Simplify Configuration

As part of reinforcing a program's brand, show producers develop specific looks that are intended to visually distinguish their show from other programming. Developing and matching those looks has always been time consuming — a task usually left to a highly experienced few, or left out completely because there was no simple way to do it.

With Creative Grading, shaders have much greater freedom to experiment in an iterative rather than a calculated process. There is no need to memorize individual steps when tweaking image parameters. Instead, by capturing unlimited system snapshots, the shader can define and easily compare multiple looks. Once the desired look is selected, it can be instantly shared across multiple cameras. Copying a full or partial set of parameters from a reference camera creates a consistent look across the show at unmatched speed.



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Snapshots also allow a shader to respond rapidly to different production requests without losing existing work.

For cameras used in a stage environment, running the Creative Grading application on a Wi-Fi enabled tablet makes it simple to establish visual matching in the front of house between physical and digital set elements. You can now take camera control to where the action is.

Conserve Resources

Today's camera shaders are not only required to simultaneously shade multiple cameras, they also need to manage multiple video formats. Because the camera settings for an SDR HD production are usually different — and less extensive — than an HDR 4K UHD production, the simplest way to handle these different control settings was to use a dedicated control panel for each camera. This increases the number of panels that must be controlled as well adding to the overall cost of the camera system.

Using the Creative Grading application, shaders can quickly modify camera settings across a group of cameras. With all HDR key settings located on the same control page, comparison for standardization and troubleshooting can be done in a matter of moments.

A Creative Grading panel can also easily toggle between streams from the same panel, storing and recalling individual settings for each stream. The instant connection between panel and camera control allows dynamic adaptation to any format (HDR, WCG, 4K UHD, etc.) in real time.

With the advances afforded by IP, Creative Grading panels are not required to be hardwired to cameras. Grass Valley's unique IP camera implementation means shaders can sit remotely from the camera and/or the XCU. All three components do not need to be co-located, enabling at-home production from anywhere.

Shaders can manage cameras that are under their control intuitively, dynamically and fast. Separating the panel from the camera also frees a subset of panels to link to whatever camera is required. This ability not only speeds initial configuration, it also allows for optimal panel use by transitioning a bank of panels to the next set of cameras while ramping down the number of cameras used for the previous show wrap up.

Enable Shading at Any Skill Level

With less and less time available before and between productions, shaders rarely have time to learn how to use all the camera functions that could help with the reality of broadcast conditions and make the tandem of shader and camera operator a more efficient team.

The visual representation in the Creative Grading UI allows a shader with even minimal training to quickly see how to modify parameters and which factors have the greatest influence. This makes it easier to learn on the job and opens up the camera functions to a much larger talent pool with a range of skill levels. Even individuals with no prior knowledge can access pre-set snapshots to recall a previously established look.



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How to Deploy

A Creative Grading solution consists of three components: a control server, one or more panels, and one or more instances of the application running on a user-provided COTS tablet.*

CCS-ONE – Cameras Control Server

The CCS-ONE contains the pre-installed Creative Grading Engine. It is a replacement for the MCP 450 and is required to have the additional functionality provided by Creative Grading. A CCS-ONE is required for each C2IP subnet and can host up to 99 cameras. It uses the Windows 10 IoT operating system, which means it can run the latest and greatest network safety tools, as demanded by many broadcasters and supports the requirements of the remote production and centralized equipment trends.

CGP 500 – Creative Grading Panel

This new control panel is a drop-in replacement for the OCP 400**, with many more options for direct controls. The joystick simultaneously enables full control of four controls of choice, such as Iris, Master Black, Variable Gain and Variable Color Temperature. Assignable knobs provide direct access for Gamma Level, ND Filter, Detail Level and Saturation or any other set of controls that are required for the task at hand. If connected via a C2IP connection without the CCS-ONE, the CGP 500 provides the unique direct controls and overview. With the CCS-ONE connected, the ability to connect and control a table is added. For dry-hires, the CGP 500 can be rented out without needing a CCS-ONE or CGA.

CGA – Creative Grading App

The Creative Grading App is available, free of charge, via the respective app stores. The Apple iPad version will be released first via the Apple Store. The Google Android Play Store and Microsoft Store will follow. The Creative Grading App requires the CCS-ONE to operate.

Commercial Reference	Description
CGP 500	Creative Grading Panel – CGP 500
CCS One	Camera Control Server – CCS One
CGA	Creative Grading App



* The first implementation for the Creative Grading App will be guaranteed to work with Apple iPad 2018 or later models.

** Use of Creative Grading and Grass Valley's OCP 400 can be mixed in the same installation.