

This guide is intended for video shaders who need to quickly set up the video settings of the Grass Valley LDX 86 HS/XS (3X/6X) camera system.

The starting-point for these instructions is an installed, configured and operational camera system. Grass Valley's Operational Control Panel (OCP 400) is used to set up and control the camera system.

For detailed information about all camera functions and the use of the control panel, refer to the respective user's guides of these devices.

Make sure that you have the highest level of control panel and camera access before proceeding.

Standard Recall

In general, the factory (or standard) values give the best all-round performance. Use the factory settings as a starting point to further tweak the settings for your situation.

Press the **RECALL STD** button and use **TYPE** to select either the **Factory** or the **Customer** file to recall. Select the **RECALL** item to reset the camera system to its **Factory** or **Customer** defaults.

Check the list below to see if the default factory values for these important video functions match your requirements and/or preferences:

Setting:	Factory Default:
Color Temperature Tint	3200 K 0
Color Saturation	100%
ND Filter FX Filter	Clear Clear
Exposure	Nominal
Gain	0 dB
Gamma Matrix	ITU709 XGL
Knee	Off
AnyLightXtreme	Off
Detail Texture	50 50
Vertical Detail Coarse/Fine	25 90
Noise Slicer	10

Many other values are set with Standard Recall. The menu reference section of the User's Guide lists the factory default values for all functions.

For more information about all video functions and settings refer to the camera's User's Guide at:

www.grassvalley.com/products/ldx_high_speed

Color Temperature

For true color reproduction the ambient lighting conditions must be compensated for by selecting a preset value for the color temperature.

Press the **COLOR** button and use the **COL TEMP** item to select a color temperature preset or use **VAR CTEMP** to set a variable color temperature:

Preset:	Conditions:
3200 K	for indoor and studio lighting conditions
5600 K	for outdoors, clouded conditions
7500 K	for outdoors, clear blue skies (very bright)
AW1/AW2	memory positions for Auto White Balance
FL50/FL60	memory positions for fluorescent light
AWC	Auto White Continuous measurement

Auto White Balance

An alternative method of setting the camera's color temperature is running the Auto White Balance procedure:

- Select **AW1**, **AW2** or **FL50/FL60** as the Color Temperature memory position.
- Press the **WHITE BALANCE** button. The button lights.
- Ask the camera operator to point the camera at a white reference surface.
- Press the **WHITE BALANCE** button again to run the Auto White Balance. The button flashes.
- After a few seconds the procedure has finished and the measured color temperature is stored in the selected memory position. The button light is switched off.

Color Tint

In some cases, Color Temperature is not enough to fully compensate for color cast so an additional tint adjustment is needed.

In the Color menu use the **TINT** item to shift hue from -150 (more Magenta) to +150 (more Green) along the magenta/green axis. Default value is 0.

RGB Gains

Advanced color adjustment can be done by changing the Gain levels for R, G and B individually. Turn the

rotary Gain controls (mid-section) on the Control Panel to add or subtract more Red, Green or Blue.

Color Saturation

Adjust the saturation level to increase or decrease color of the picture.

In the COLOR menu adjust the SATURATION item from 0% (fully desaturated) to 200% (maximum saturation). Default value is 100%.

Optical Filters

Use the optical neutral density (ND) filters to reduce the incoming light and to control the depth of field (or exposure levels).

Press the FILTERS button and use ND UP and ND DOWN to step through the Neutral Density filters:

Presets	ND-filter:
Clear	No filter
ND1/4	Neutral Density 2 stops down
ND1/16	Neutral Density 4 stops down
ND1/64	Neutral Density 6 stops down

A second filter wheel with Special Effects (FX) filters is also available. Use FX UP and FX DOWN to step through the Special Effects filters:

Presets	FX-filter:
Clear	No filter
Star 4P	Four-Point Star filter
Sft Fcs	Soft Focus filter

Gain

Depending on the available light level it may be necessary to adjust the video Gain settings of the camera. Make sure that the ND filter is set to Clear before increasing Gain.

Press the GAIN button and use GAIN+ or GAIN- to select the Gain presets:

Presets:	Gain:	When to use:
-	-3 dB	for ideal light situations
0	0 dB	No video gain
+	+ 3dB	for lower light situations
++	+ 6dB	for low light situations
+++	+ 12dB	for very low light situations

Use the VAR GAIN item in the Gain menu to fine-tune Gain between -3 dB and +12 dB.

For very low noise operation try the -3 dB Gain preset. Note: this reduces the dynamic range.

Gamma

To compensate for the non-linear response of display devices, a Gamma correction is applied to the video signal. This correction changes the tonal response of the standard transfer curve. Try different Gamma curves to adjust the look of the picture to your personal preferences.

Press the GAMMA button and use the GAMMA CRV item to select the curve you want to use.

LDX	Gamma curve:	(LDK)
BBC04	BBC 0.4 curve according to BBC TV 2248 standard.	BBC04
BBC05	BBC 0.5 curve according to BBC TV 2248 standard (less widely used).	BBC05
BBC06	BBC 0.6 curve according to BBC TV 2248 standard (less widely used).	BBC06
ARD	Curve according to ARD Pflichtenheft 8/4 and SMPTE 240M standard.	ARD
ITU709	Curve according to the ITU709 standard.	CCIR
GAMMA-J	Renders more saturated colors with slightly lower noise levels. Use for film look.	709J
GAMMA-S	For accurate color reproduction with more black and highlight compression. Use for film look.	709S

Color Matrix

The Color Matrix circuit balances the color spectrum to create an accurate representation by mixing the three primary colors.

Press the SETUP button, select CAM to enter the Camera Setup menu and go to the MATRIX item to select the color Matrix:

Matrix:	Color reproduction:
EBU	Neutral color reproduction according to EBU Tech 3237E.
Skin	Optimized for general skin tone reproduction.

Matrix:	Color reproduction:
B/W	Produces a luminance (Y) signal in all three color channel to produce a monochrome (B/W) picture. When Matrix is placed before Gamma, individual Gamma controls can be used to paint the monochrome picture to get brown, sepia or greenish tones.
RAI	RAI TV optimization. Used for matching with cameras from other manufacturers.
BBC	BBC TV optimization. Matrix coefficients were calculated by comparing a color monitor picture with a test chart looking through a color correction filter.
1:1	Color matrix is switched off. Used for test purposes. No mixing between R, G and B.
CoolFL	Optimized for mixed fluorescent and incandescent lighting.
XGL	For more vivid color reproduction. Also suited for color matching with cameras from other manufacturers.
Var1/Var2	Variable Matrix coefficients set 1 and 2. On the Matrix page, select the VAR MTRX item to manually adjust the Matrix coefficients.

Note: Use Optimal or Good if there is no flicker and try to avoid using higher than Fair unless flicker is substantial.

Knee

The Knee function compresses the wide dynamic range of the video signal coming from the imager into the more limited video output range.

Press the **KNEE** button and use the **KNEE SEL** item to select Var (default is Off) for Variable Knee. Set up Variable Knee with the following parameters:

- Knee Point (KN POINT)—the video input level from which Knee starts compressing. Default value is 35%.
- Knee Max Input (KN MAX IN)—the maximum allowed video input level. Default value is 200%.
- Knee OutLimit (KN OUTLIM)—the maximum video level that is produced at the video output. Default value is 100%.

Black Stretch

Black Stretch changes the level of tones in the shadow areas of the picture without affecting the rest of the picture.

Note: Only use when needed for specific scenes.

Press the **BLACK** button and switch on the **BLACK STR** item. Use the **BLACK LVL** item to adjust the Black

Stretch level from 0 to 99. Values below 50 are Black Press, values higher than 50 are Black Stretch.

Contrast

To create more or less contrast in the picture, luminance levels can be fine-adjusted independently for three tonal ranges.

Press the **GAMMA** button and go to the **CONTRAST** item. Switch it on and select **SHADOWS**, **MIDTONES** or **HIGHLIGHTS** to adjust the level for each range.

Use Contrast to distribute the tonal values over the full dynamic range of the camera.

AnyLightXtreme™

Due to the camera's high speed scanning frequency and the alternating amplitude of many artificial light sources flicker reduction may be necessary. This is especially the case when unbalanced three phase lighting is used.

Press the **EXP. TIME** button, go to the **LIGHTING** item and select the preset to use for flicker reduction, depending on the lighting conditions. Default is off.

To find the best preset for your situation do a test recording and then evaluate the results at slow motion playback (33% or 17% speed rate in Dyno).

Start with Optimal (no flicker reduction) and when flicker is noticeable, select Good. When there is still flicker visible, try Fair or Poor (strong flicker reduction—may introduce artifacts) presets.

Preset:	Lighting conditions:
Off	AnyLightXtreme is switched off.
Optimal	Daylight and non-alternating or high-frequency artificial lighted environments. Each field has the same video level and flicker reduction is not needed.
Good	Artificial lighting with minor amplitude changes, for example incandescent or well-balanced three-phase lighting. Use this preset also when daylight and artificial light with alternating effects are combined.
Fair	Artificial lighting with significant amplitude changes, for example fluorescent lighted environments.
Poor	For artificial lighting with major amplitude changes; HMI, MHD, gas discharge lamps or neon light.
Extreme	For extreme lighting conditions. Results in a completely flicker free picture but increases motion blur.

Use **Optimal** or **Good** if there is no flicker and try to avoid using higher than **Fair** unless flicker is substantial.

Detail

Detail is an image enhancement used to improve sharpness perception. The detail function raises the contrast at the dark-to-light and light-to-dark transitions, thus making edges of objects appear sharper.

Press the **DETAIL** button and use **DTL LEVEL** to adjust the amount of detail added to the picture. Default value is 50.

Texture

Texture adds subtle sharpness to very fine textures (e.g. fabrics, leaves and stone surfaces) in the image.

Press the **DETAIL** button and use **TEXTURE** to adjust the amount of texture added to the picture. Default value is 50.

Detail Equalizer

The Detail Equalizer allows to set the Detail levels for **SHADOWS**, **MIDTONES** or **HIGHLIGHTS** individually. In general, shadow areas need less Detail enhancement as it increases noise levels.

Press the **DETAIL** button and go to the **DETAIL EQ** menu. Switch on the **DETAIL EQ** item and use the **SHADOWS**, **MIDTONES** or **HIGHLIGHTS** to adjust the Detail level for each tonal range between 0 (no Detail) and 99 (much Detail). Default value is 50.

Auto Skin Detail

Skin Detail is set up to select a particular color area in which Detail can be set independently of the rest of the picture. Up to three Skin Detail sets can be defined and used independently

Skin detail is mainly used to reduce the level of Detail in a person's skin tone to produce a more attractive picture. Decreasing the Detail level of a person's skin softens the skin tones.

Skin Detail function is not limited to a particular color and so can also be used to achieve various effects in selected color areas. For example, decrease the Detail level of a soccer field to accentuate the players or increase the Skin Detail level to accentuate a rough surface.

Carry out the Auto Skin Detail procedure as follows:

- Press the **SKIN** button and select **SET 1** to open Skin Detail Set 1.

- Select **SKIN AUTO**.
- Ask the camera operator to point the camera at the intended color area in the picture.
- Select **SKIN AUTO** again to start the Auto Skin Detail Procedure. It runs for a few seconds.
- Adjust the Skin Detail Level with the **SKIN LVL** item. Decrease the value below 50 to soften the selected area or increase above 50 to add Detail.
- Repeat the steps for Skin set 2 and 3 sets if required.

Set skin view to **On** to show the affected area. The color range set by the automatic procedure can be adjusted manually if required.

Advanced Detail Settings

Fine-tune Detail further by setting the following advanced functions:

Coarse/Fine (C/FINE)—sets Detail balance between coarse and fine structures in the image (0 = coarse structures get more Detail, 99 = fine structures get more Detail). Default value is 90.

Level Dependency (LEVEL DEP)—sets how much Detail is reduced for dark areas (0 = no reduction, 99 = maximum reduction). Default value is 30.

Note: Try a higher value when Detail produces too much noise in dark/grey areas.

Detail Noise Slicer (NOISE SL)—reduces Noise generated by the Detail circuit. Lower values leave more Noise in Detail (crispy picture), higher values reduce Noise in Detail (softer picture). Default value is 10.

Store Settings

After setting up video you can store your settings as the standard customer file.

Press the **SETUP** button, select the **CAM** menu and navigate to the **VF MENU** item. Select it to go to the camera menu. Make sure you have a camera monitoring channel available to see the camera's menu text.

In the camera menu, go to the **CONFIGURATION** menu and enter the **CUSTOMER FILES** menu. Select the **STORE CUST FILE** item to store current settings as the new Customer Scene File.