

LDX Introduction session

2017/18

Mastering High Definition Cameras

 FUTURE-READY

Your Host for today and/or this week
Jan Paul Campman
support and advice Remko Schoutens



grass valley

A **BELDEN** BRAND

Part 1:

- ❑ Introduction & Basic information
- ❑ Menu structures
- ❑ LDX Basic functions



Introduction LDX series

The LDX series Camera

Main differences: (Compared with the previous LDK8000)

- **Xensium FT imager**
 - New video functions
 - Lens corrections
 - New leaking pixel corrector “TrueTexture”.
 - Improved LED-wall artifact compensation.
 - New menu structure with rotary knob
 - Changed button layout
 - More user friendly interface.
 - “Art Touch”.
 - Diagnostics
 - New mounting method camera <-> adaptor



Introduction LDX series



Licenses LDX series 2017

Camera and Adaptor



- 3G Triax LDX 5640
- 3G Fiber LDX 5650
- 10G Fiber LDX 5680

Price

no License
for Focus

Focus 70/75

Triax or Fiber

LDX82 WorldCam
Only with License

LDX82 Elite

LDX82 Premiere

LDX82 Flex

XDR

XDR

XDR

XDR

3G Triax or 3G Fiber also with 10G Fiber

License

LDX86(n) Universe

LDX86(n) XtremeSpeed

LDX86(n) HighSpeed

LDX86 WorldCam

3/6 speed 4K

3/6 speed

3 speed

XDR

XDR

XDR

XDR

Direct

License

3G Triax
No HighSpeed

3G Fiber
No HighSpeed

Only 10G Fiber

Functionality

Licenses LDX series

The LDX Series Camera

LDX available in *Several* versions

- LDX Flex
- LDX Premiere
- LDX Elite
- LDX WorldCam
- LDX HighSpeed
- LDX XSpeed
- LDX Direct IP
- LDX XDR
- XCU Univers

e-Licenses

Licenses are one-step incrementals

This enables the path towards buying bulk licenses,
while the customer has many different flavors of models

Licenses are available via the sales channels

Licenses are available for long and short periods

Licenses are downloadable files (from USB or FTP to camera)



The LDX series Camera

What camera type within the GV product line



Focus series



LDX 82 Series



LDX 82 Compact Series LDX 86 Compact Series



LDX 86 series



LDX 86 now available in 2 flavors

LDX 86



LDX 86n *(native)*



LDX 86 now available in 2 flavors

LDX 86

Available with Licenses as :

- 4K not native
- High Speed 3x or 6x
- XDR
- Standard video modes
- Direct IP

LDX 86n *(native)*

Available with Licenses as :

- 4K NATIVE
- High Speed 3x or 6x (under developent)
- XDR
- Standard video modes
- Direct IP



LDX 86 now available in 2 flavors

LDX 86
Better pixels
when they make sense

LDX 86^N
Native 4K pixel
when resolution count



Strength comparison - Native 4K versus Processed 4K

■ Use the technology which fit best to the specific requirements

■ For **wide angle** shooting position

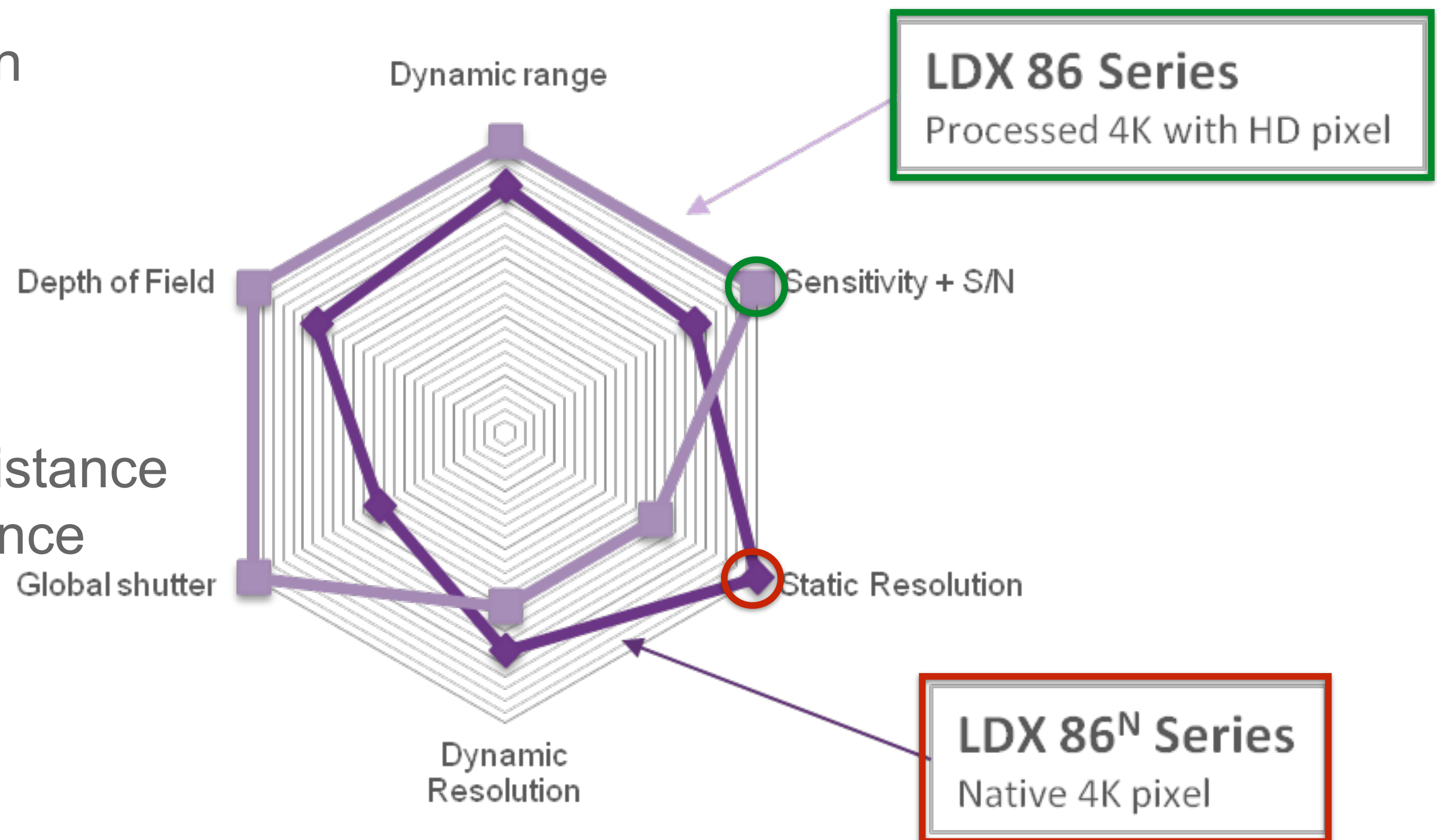
Resolution is most important

- To see all the small details in the image

■ For telephoto shots over large distance

Sensitivity is of highest importance

- Being able to reach a large depth of field



Grass Valley Cameras Basics overview



Grass Valley Cameras Basics overview



Grass Valley Cameras System overview



Reflex *(Super expander)*



Power convertor

Available in several flavors
Triax to Fiber
Fiber to Triax



Fiber power box (HDX plus)



Adaptor

LDX

Available in several flavors
3G Triax
3G fiber
10G Fiber



Focus Triax
Focus Fiber



Available in several flavors
Focus 70 / 75
LDX 82 series
LDX 86 series

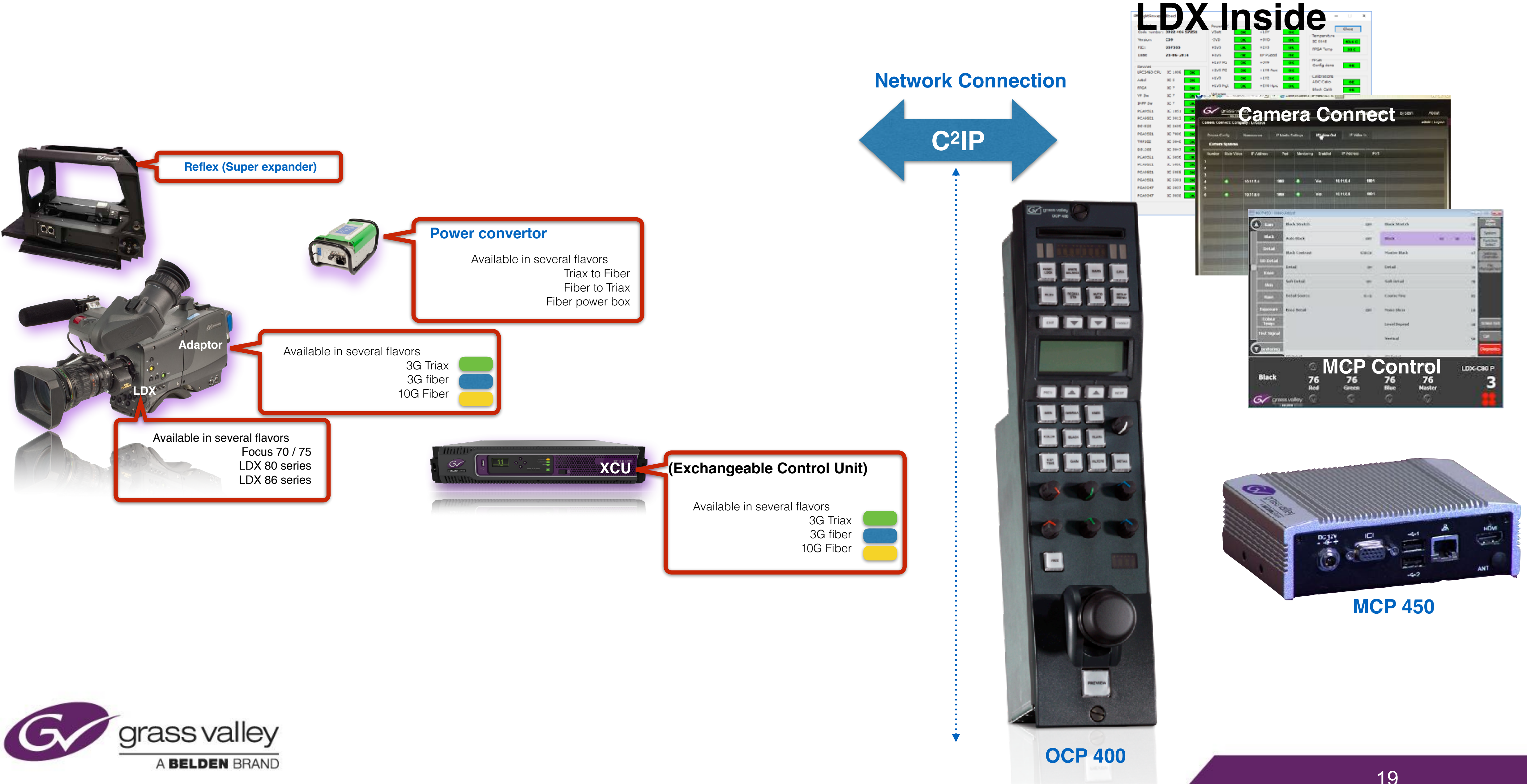


(Exchangeable Control Unit)
(Base Unit for Focus series)
Available in several flavours

3G Triax
3G fiber
10G Fiber



Grass Valley Cameras System overview



Grass Valley Cameras Video modes overview

Available

1080i or 720p

Not available

		License				License						
Triax		Entry level Focus 70 / 75		Mid Range LDX 82 series				High End LDX 86(n) series (with Universe XCU)				LDX 86n
Fiber 3G												
Fiber 10G	Adaptor type >											
Available as	Compact >>				C82	C82		C86/86n	C86/86n	C86/86n	C86/86	C86/86n
Format	Type Modes	70 (APAC)	75(rest)	Flex	Première	Elite	WorldCam only with Lic	WorldCam	HiSpeed	Xtreme Speed	Univers	4K Univers
HD 50/59Hz	720p	or		or								
	1080i	or		or								
	1080PsF											
	1080p											
HighSpeed 50/59Hz not 4K	3 x 1,5G											
	3 x 3G											
	6 x 1,5G											
4K 50/59Hz	4K (CONV)										86	
	4K native											C86/86n
License	XDR								Single Speed	Single Speed		

Grass Valley Cameras **Functions/Features** overview

Available

Not available

License

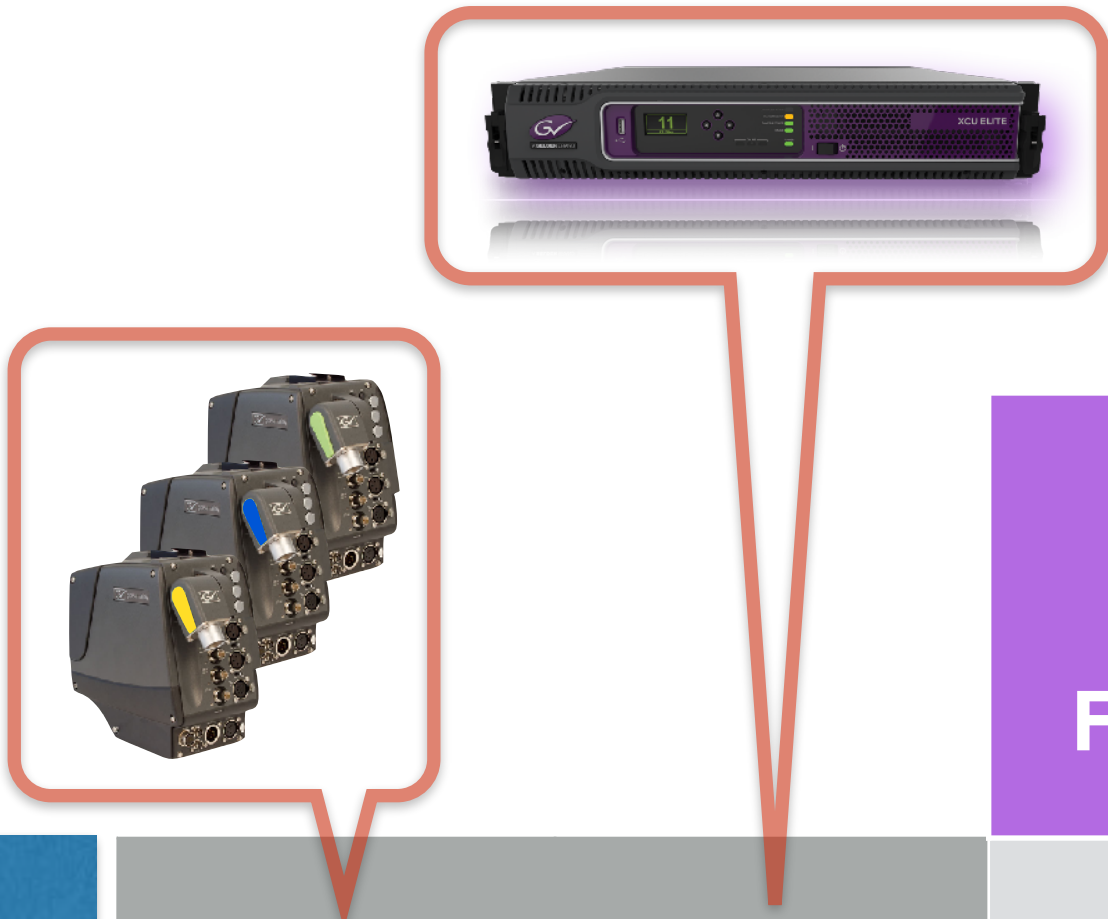
License

Same for Compact versions

			Entry level Focus 70 / 75		Mid Range LDX 82 series				High End LDX 86(n) series				LDX86n
Functions	Functions	Features Type	70	75	Flex	Première	Elite	WorldCam only with Lic	WordCam	HiSpeed	Xtreme Speed	Univers Cam/XCU	4K native
	Standard	Gamma											
		Knee											
		Detail											
		Matrix											
	ArtTouch	Power Curves											
		Details Equalizer											
		Color protect											
		DoF indicator											
		Sensitivity modes											
		Effect filter											
	HighSpeed	AnyLight											
	XDR(Lic)	Gain / Detail											
	4K	4K Details											

Grass Valley Cameras XCU /Adaptor overview

 Not applicable



License 

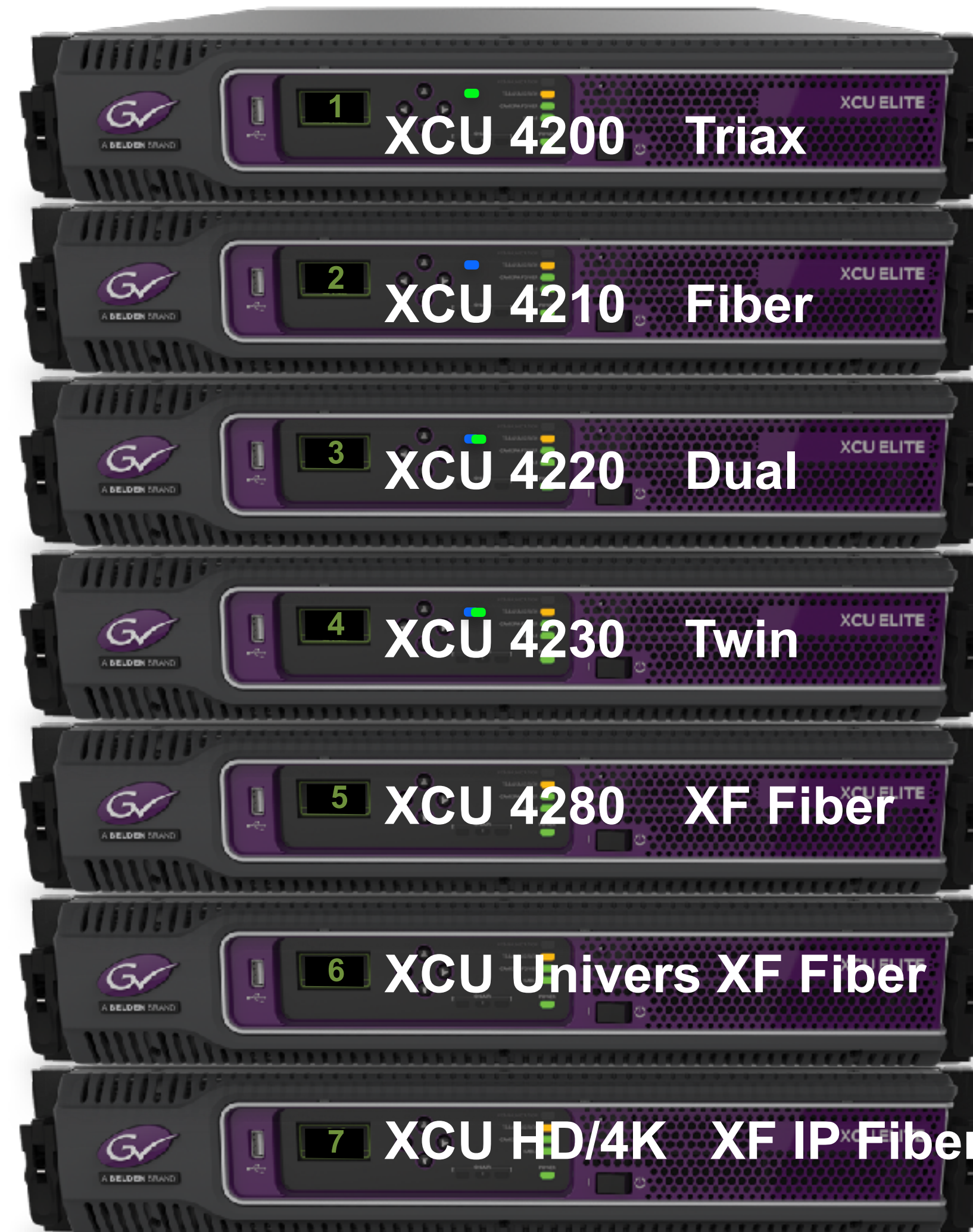
License 

		Entry level		Mid Range				High End				
		Focus 70 / 75		LDX 82 series				LDX 86(n) series				LDX86n
XCU/Adaptor types	Type	70	75	Flex	Première	Elite	WordCam	WordCam	HiSpeed	Xtreme Speed	Univers Cam/XCU	4K native
	Triax BaseUnit											
	3G XCU											
	Fiber BaseUnit											
	Fiber 3G XCU											
	Fiber 10G XCU											

Grass Valley System overview

Products for 2015 / 2016

Focus BaseUnit not visible on this slide



3G Triax Adaptor LDK 5640
3G Fiber Adaptor LDK 5650
10G Fiber Adaptor LDX 5680

Grass Valley System overview



Products for 2018 NAB

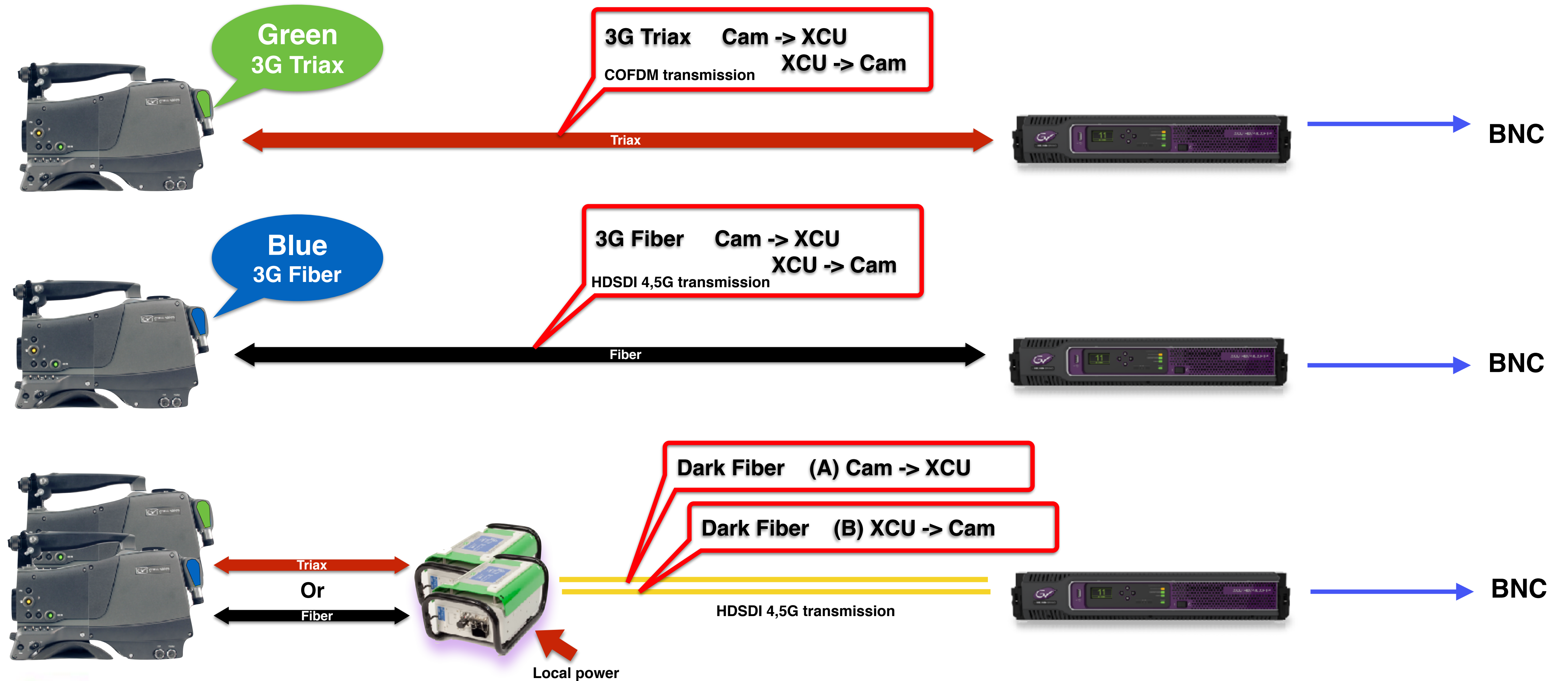


UXF XCU

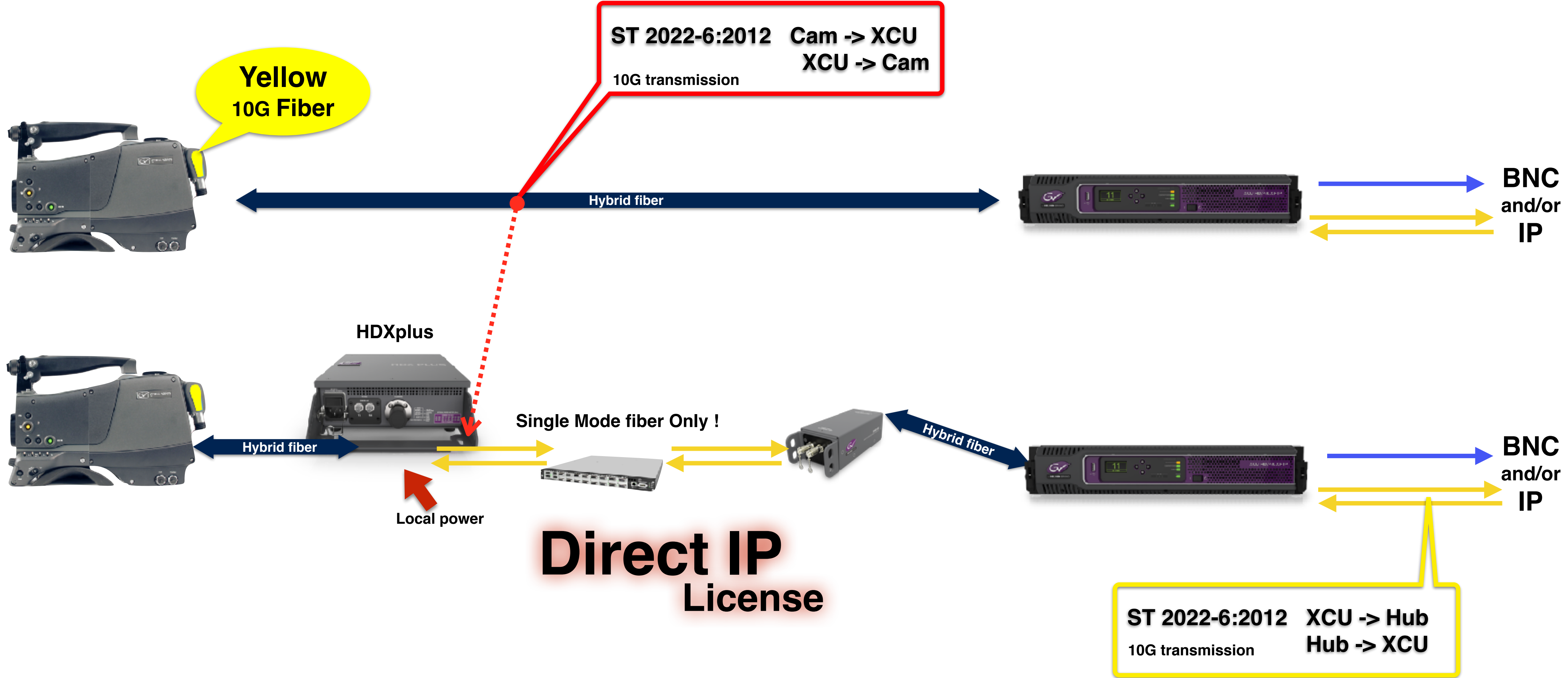


3G Triax Adaptor LDK 5640 
3G Fiber Adaptor LDK 5650 
10G Fiber Adaptor LDX 5680 

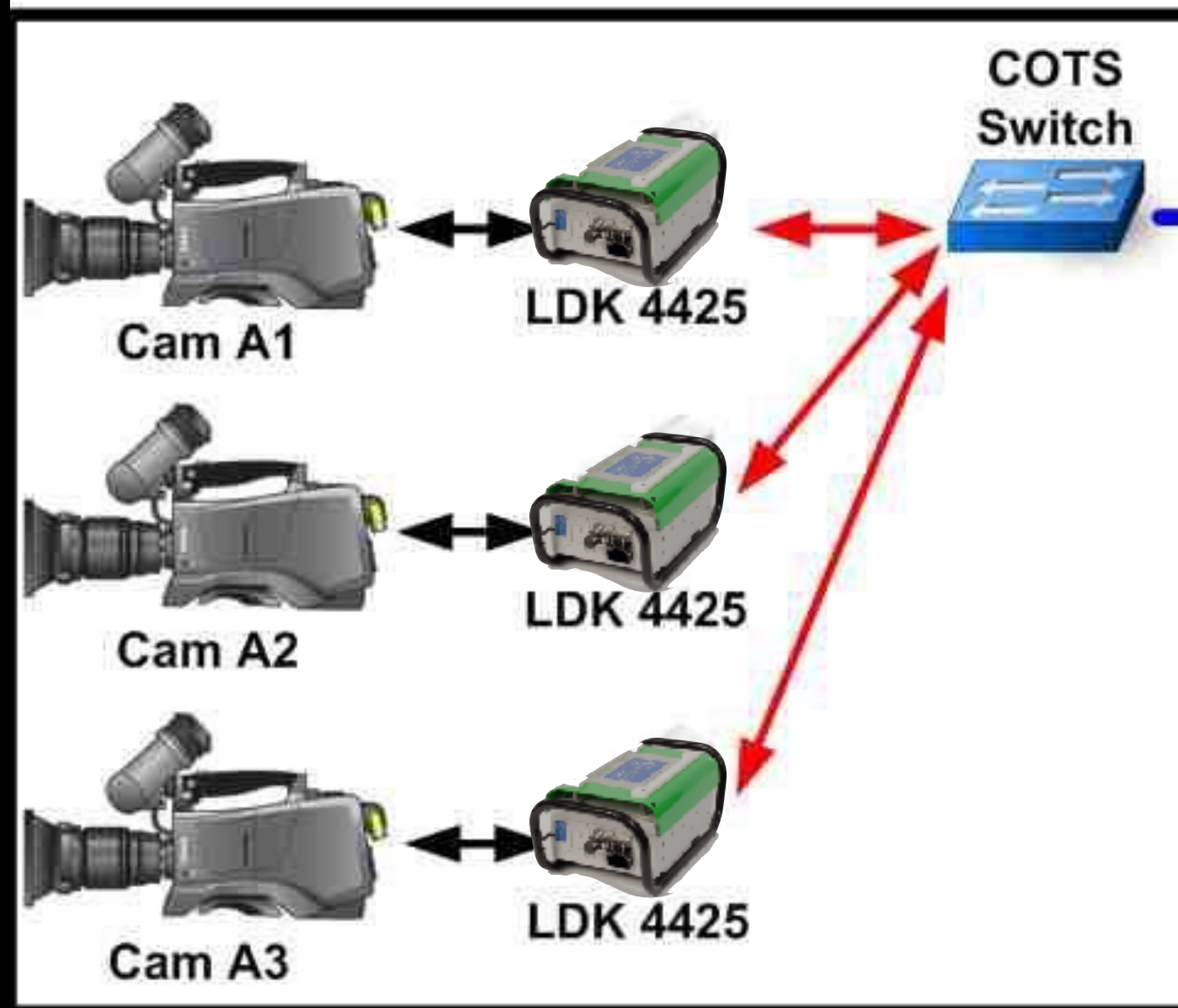
Available (3G Triax/Fiber) System connections



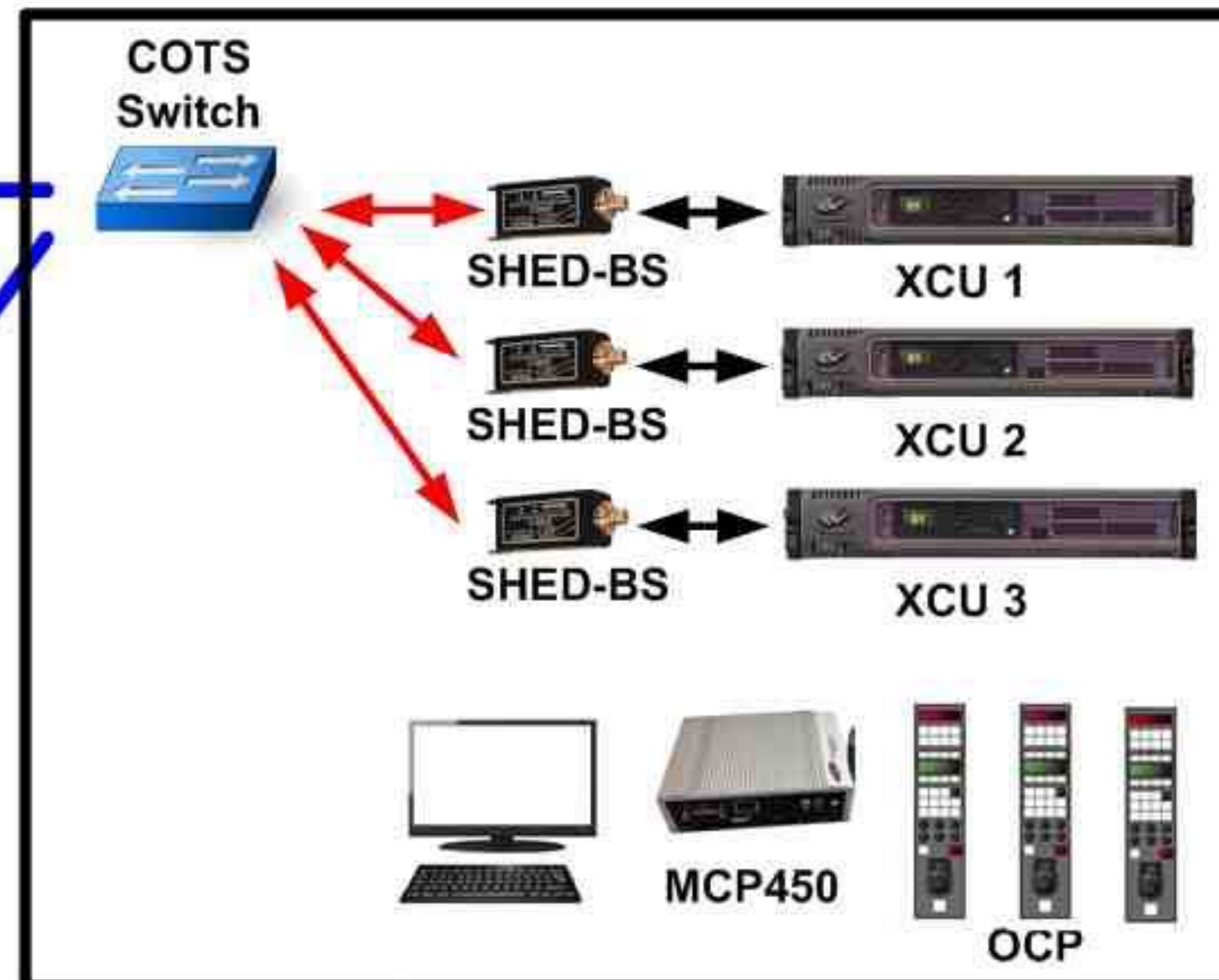
Available (10G IP based) System connections



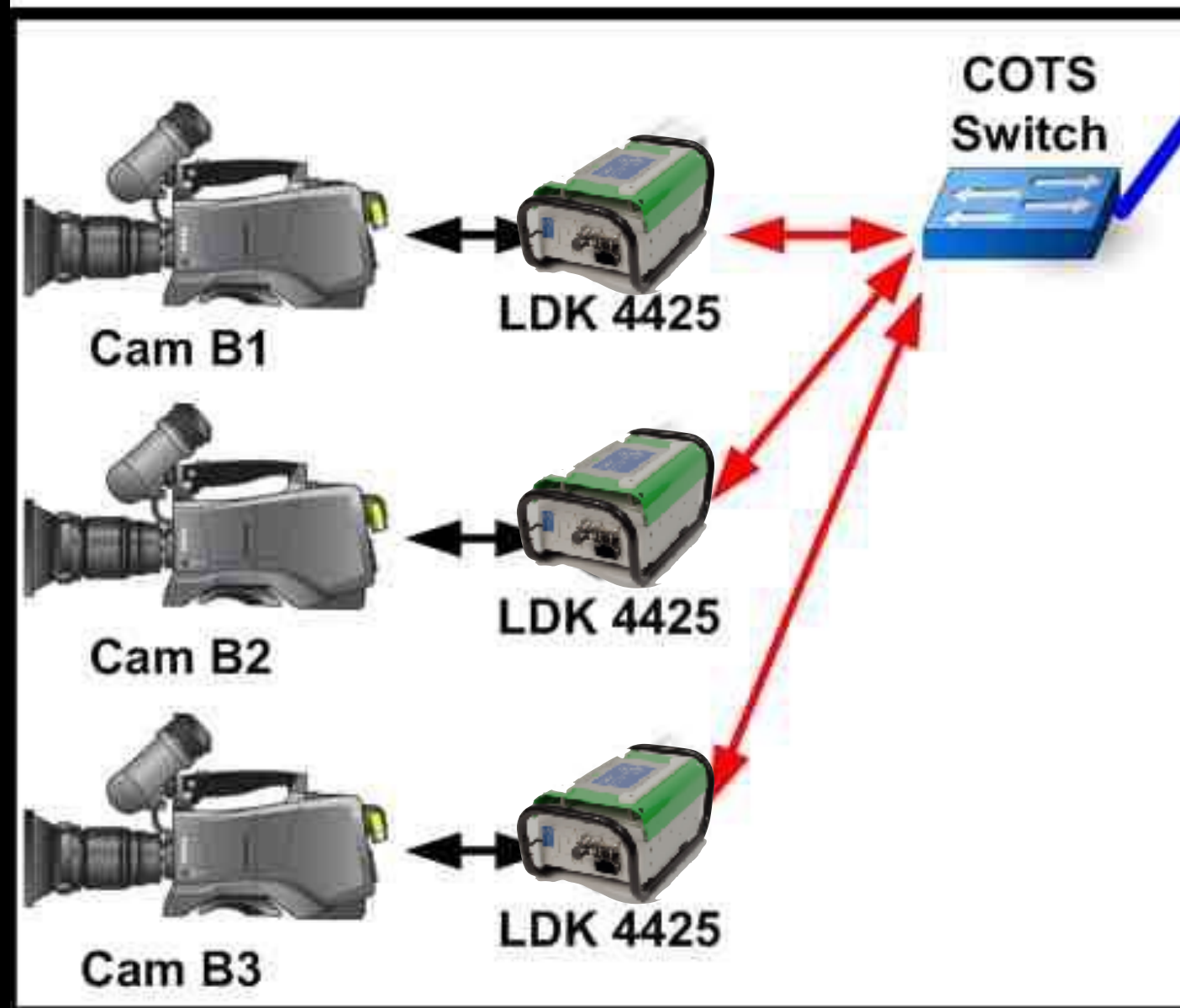
Studio A



Control Room






Studio B



IP Trunk
(same network)

IP Trunk
(same network)

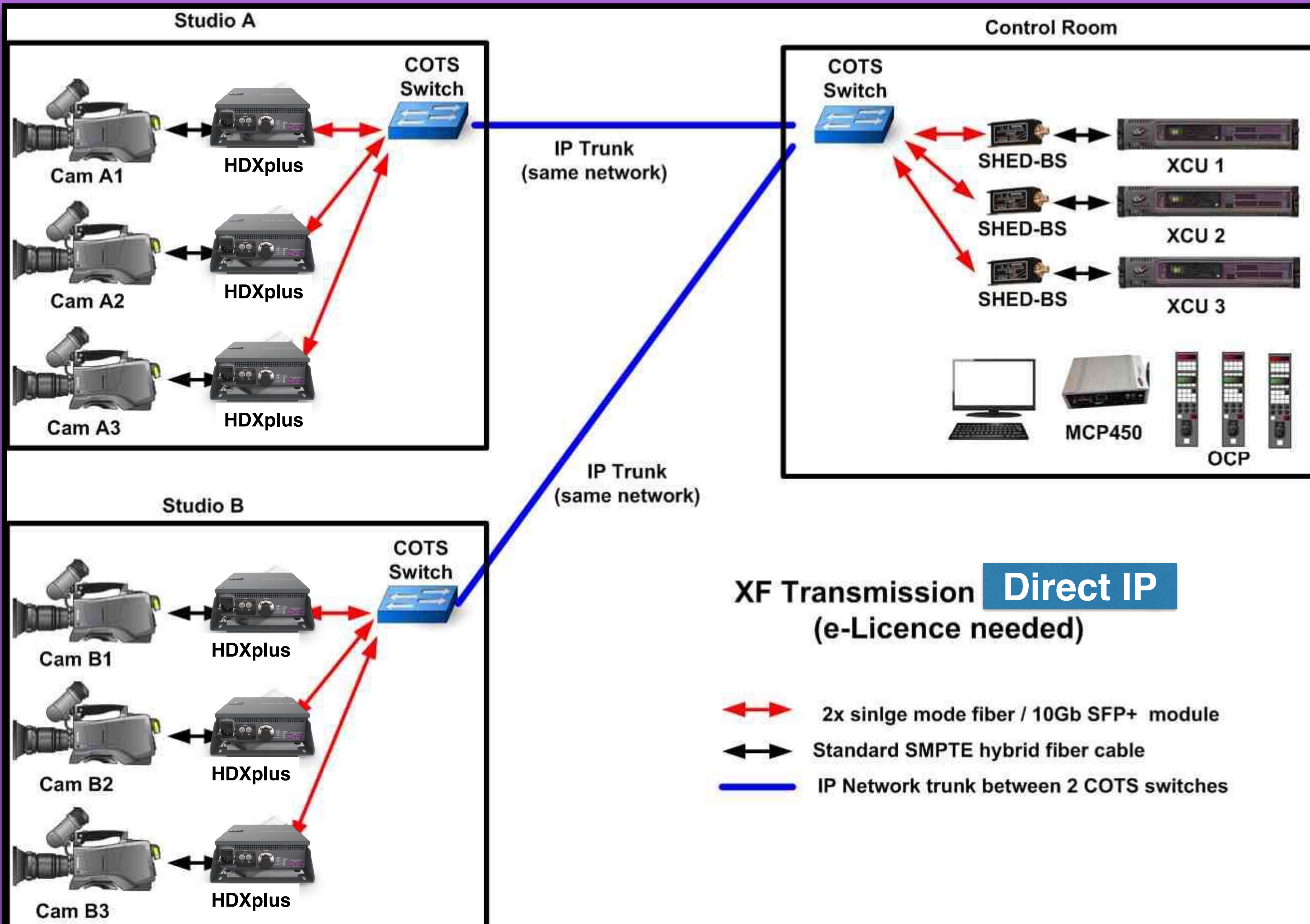
XF Transmission **Direct IP**
(e-Licence needed)

-  2x single mode fiber / 10Gb SFP+ module
-  Standard SMPTE hybrid fiber cable
-  IP Network trunk between 2 COTS switches

DIRECT IP
(licence needed)

Example





DIRECT IP
(licence needed)



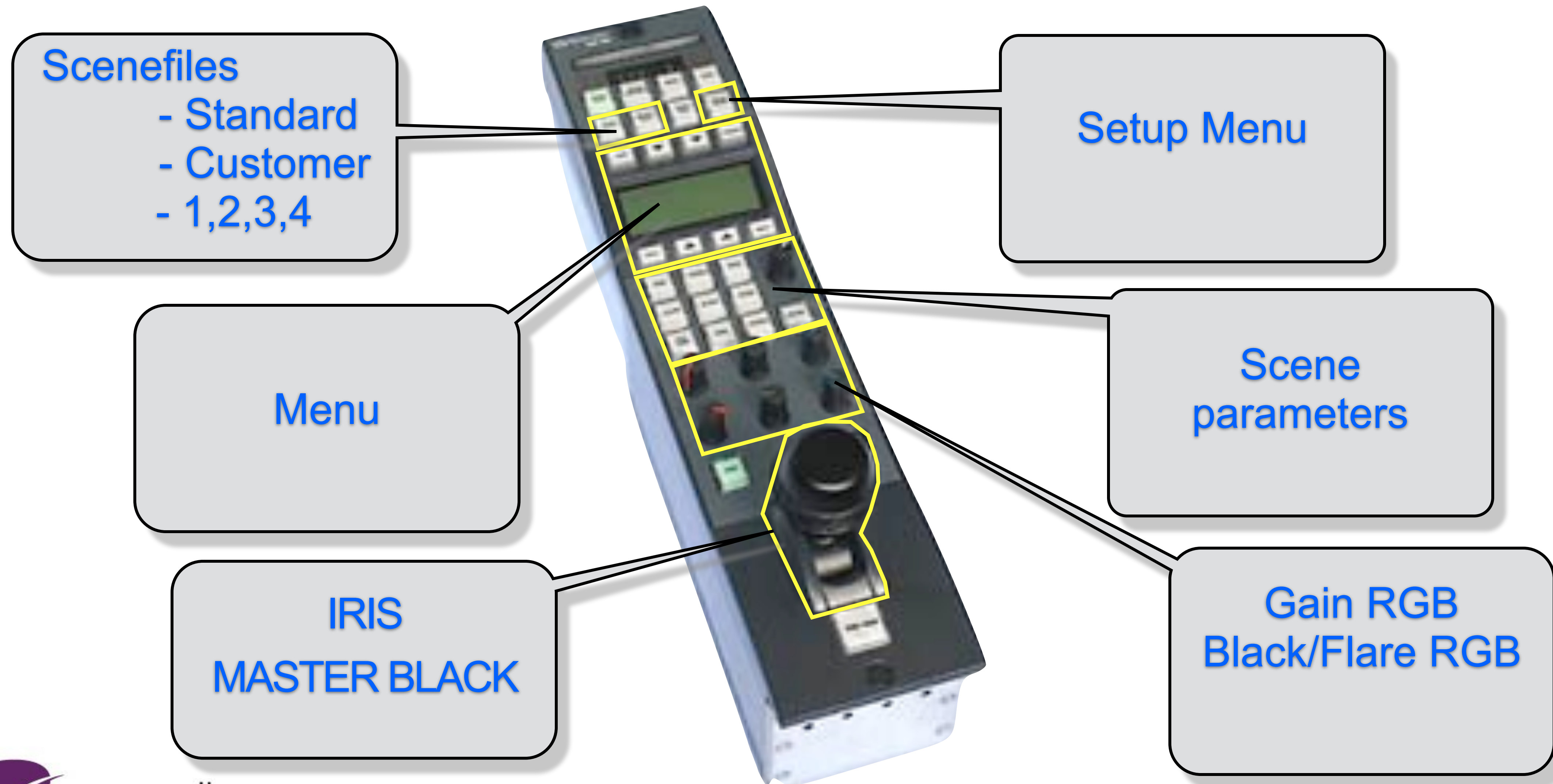
Generic Operational Controls





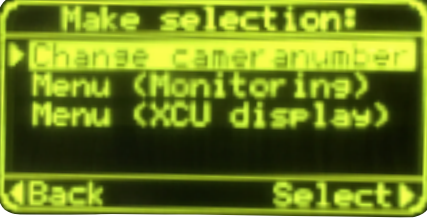





TOUCH



Generic Operational Controls



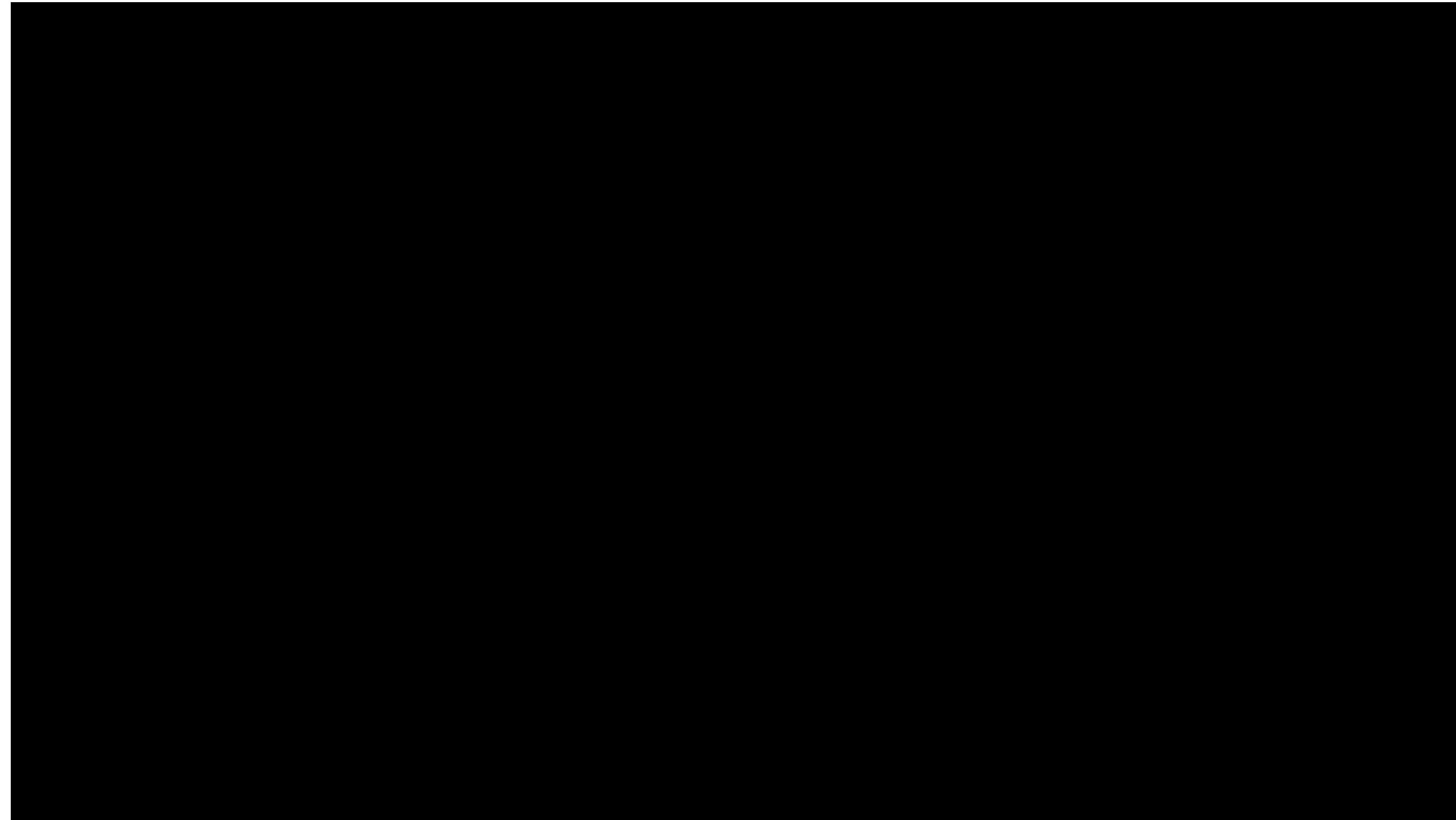
Generic Operational Controls

						
		Viewfinder		External Monitor		Display XCU
menu type		Camera	VF setup	CAMERA	XCU	only for 10G XCU
    	Camera buttons					
	XCU buttons					
	VF buttons					
	OCP main buttons					
	OCP setup					

Generic Operational Controls

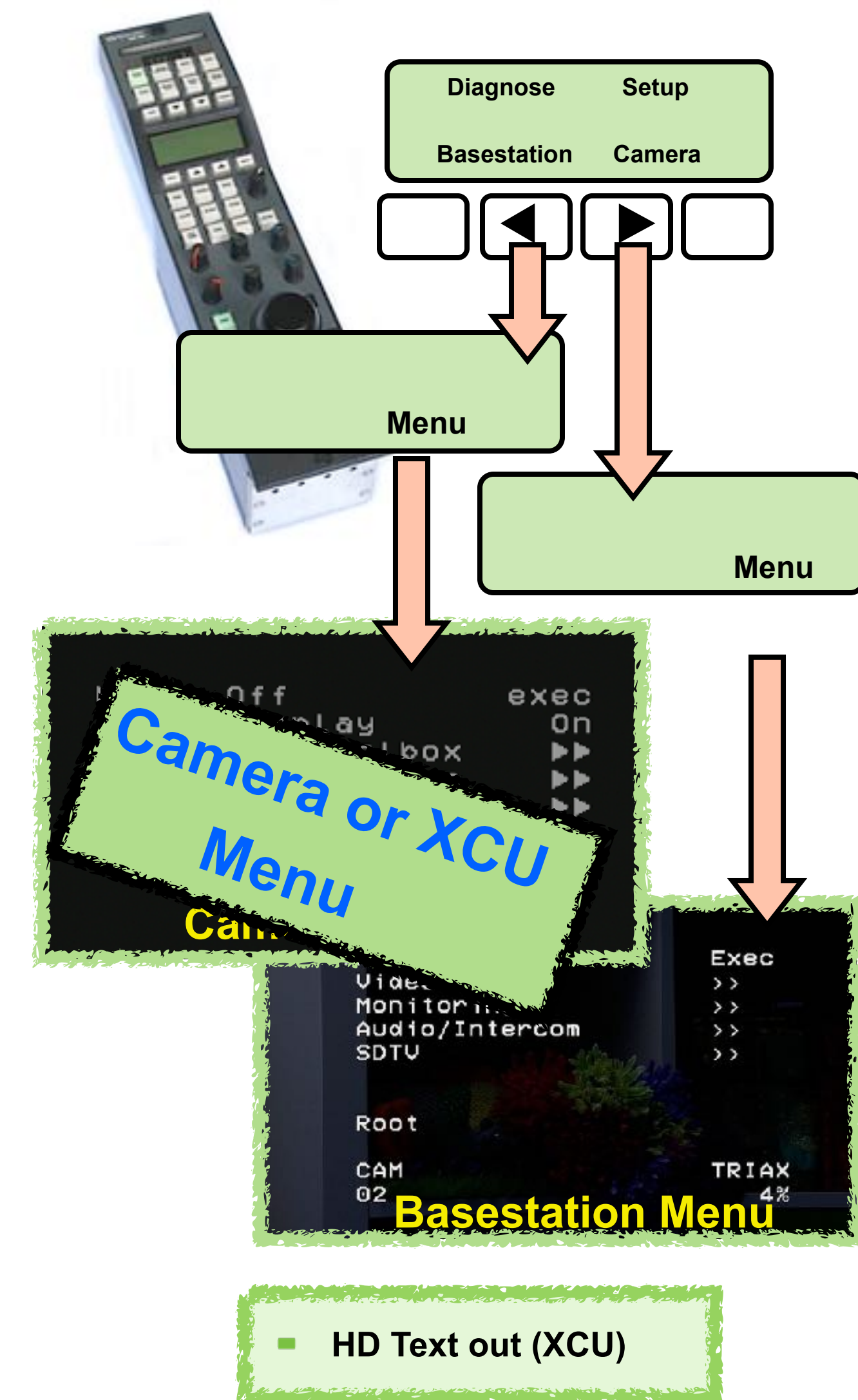
Camera or XCU

menu from OCP



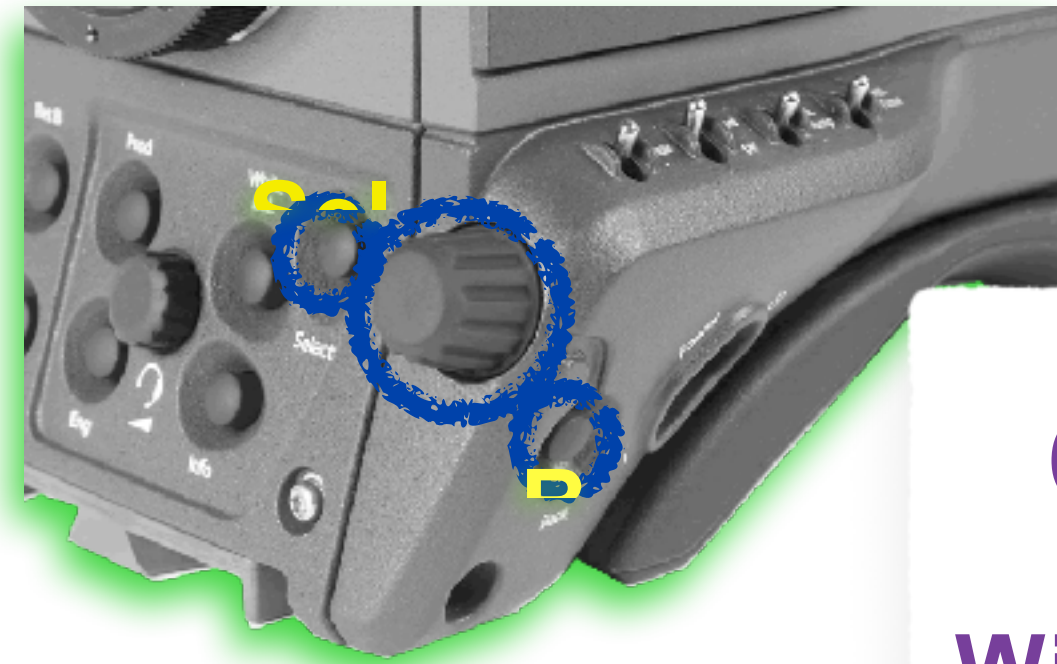


■ HD Text out (XCU)



■ HD Text out (XCU)

Generic Operational Controls



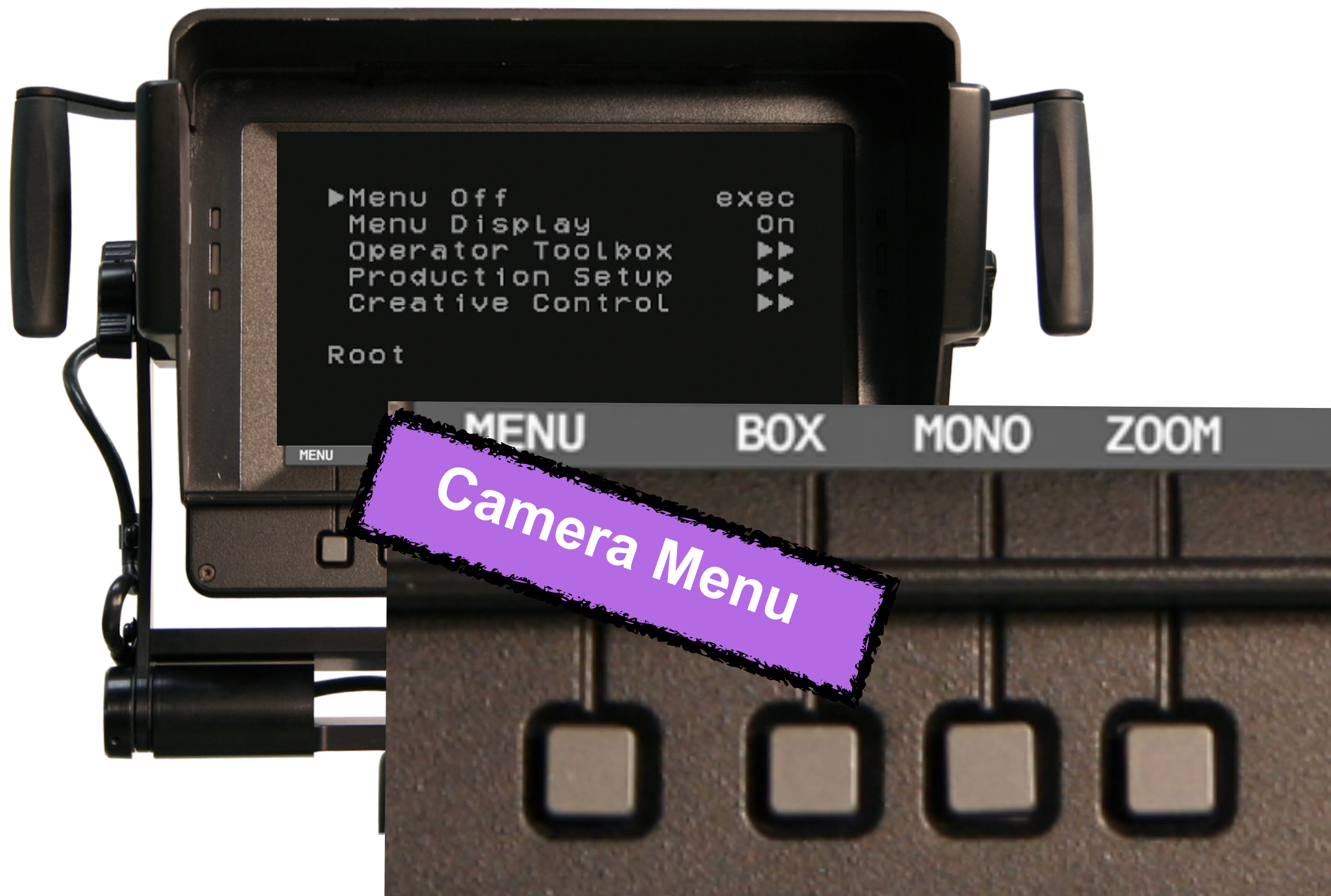
Camera menu

With the Menu from the Camera you can select the the functions in the camera menu

- Scene (Video)
- Operational
- Install
- Lens



Generic Operational Controls



Camera Menu with Viewfinder

With the Menu from the Viewfinder you also can select the the functions in the camera menu

- Scene (Video)
- Operational
- Install
- Lens

Generic Operational Controls



VF Menu for VF settings

With the Menu from the Viewfinder
you can select the the functions
from the Viewfinder menu

Settings within the Viewfinder

- Diagnostics
- Settings



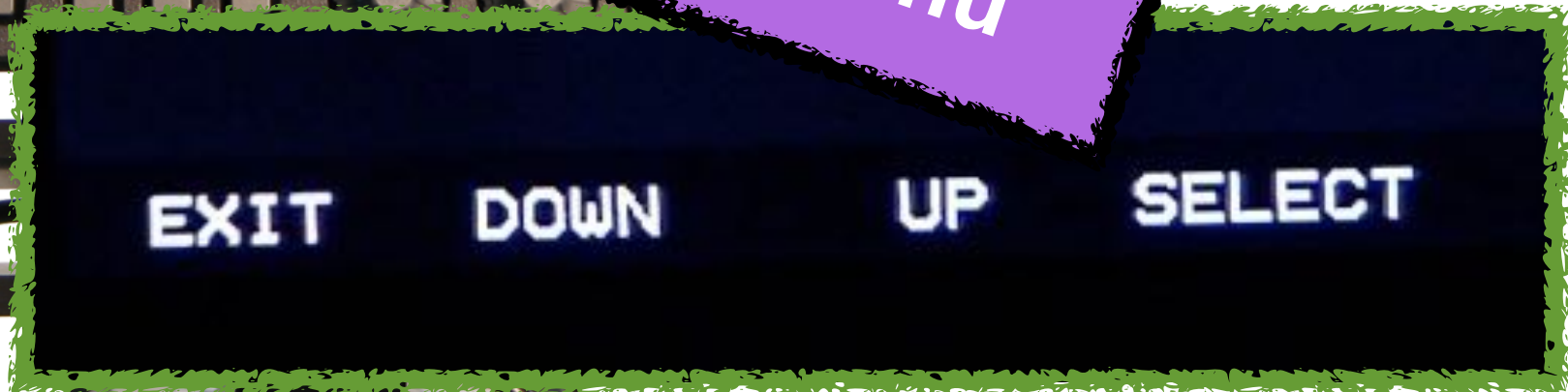
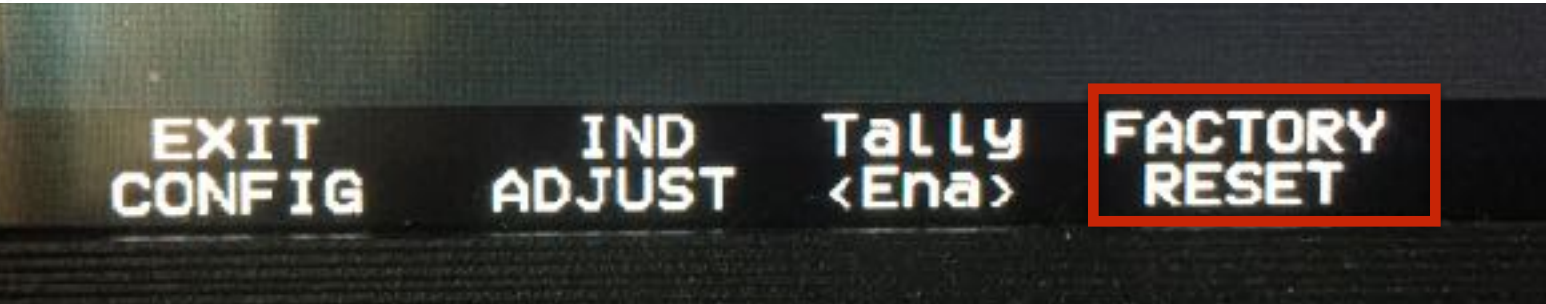
Viewfinder Menu



Generic Operational Controls



In **Config 1** you will find the Factory Reset VF



Generic Operational Controls

XCU Menu for Basestation settings

With the XCU Menu
from the Basestation
you can select the
following functions

- Diagnostics
- Settings XCU

HD Test out (XCU)



XCU Worldcam or Univers

Hold 2 seconds
to enter menu

XF Fiber

New menu control with XCU display



Make selection!

► Change camera number

Menu (Monitoring)

Menu (XCU display)

◀ Back Select ▶

XCU Menu control

◀ ▲ ▶

▼

Hold ◀ to Exit



Root

► Menu off

Video

Monitoring

Audio/Intercom

◀ exec ▶



XCU Type: XCU4280XF

XCU PID: 037W67

Package: OK

12NC: 6455

Version: v02.00

02 Status

Extern 1: No

Extern 2: No

Extern 3: No

TP: None

Reference: 1080i50

Gen Lock: Yes

02 Signals

Fiber A

Cable OK

Signal OK







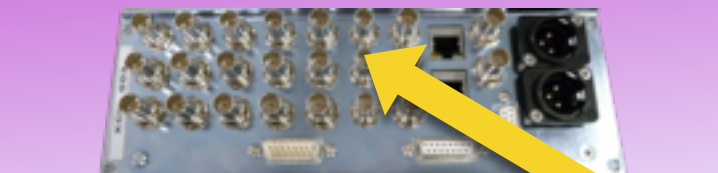
Fiber B

Cable OK

Signal OK

02 Transmission

Menu Controls Camera/XCU/VF

				
Camera	XCU	VF	OCP	OCP/ MCP
Camera menu	Basestation menu	Viewfinder menu	Camera or Basestation menu	Main functions
menu with viewfinder	menu with HD monitor (text out)	menu with viewfinder	menu with HD monitor (text out)	Direct access from Functions
				

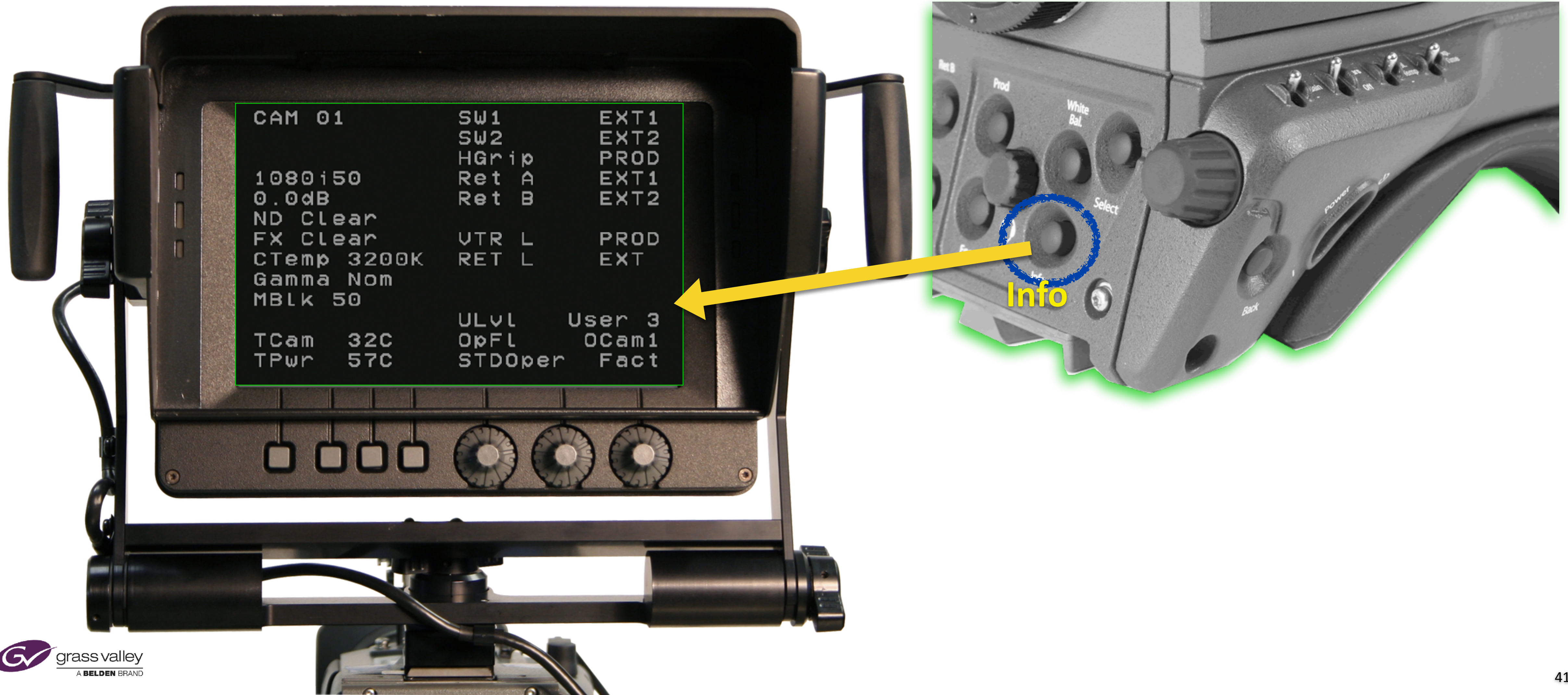
Menus

With the Menus from the Camera, Basestation and OCP you can select the the functions in the camera system

- Settings Camera
- Settings VF
- Settings XCU
- Install
- Diagnostics

Menu Controls Camera/XCU/VF

The Info button



Menu Controls Camera/XCU/VF

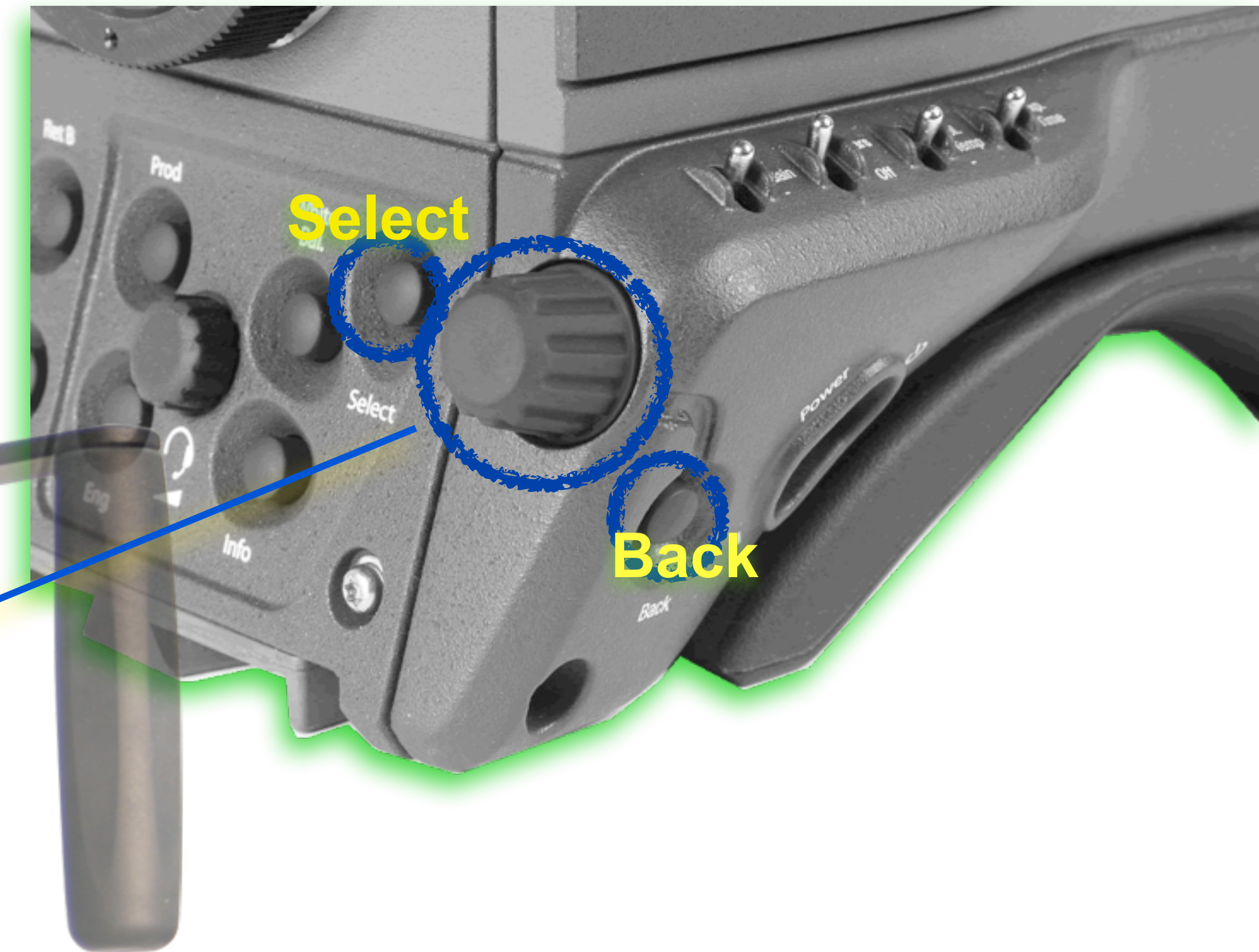
The Main Menu

- LDX Menu structure

▶ Menu Off exec
Menu Display On
Operator Toolbox ▶▶
Production Setup ▶▶
Creative Control ▶▶

Root

MENU BOX MONO ZOOM Pk: 20 Br: 50 Cn: 99



Menu Controls Camera/XCU/VF

The ArtTouch Menu

- **New arrangement of items and functions. (button locations)**

Camera functions are centered around broadcast workflow phase and task oriented

- **Better syntax, terms and language.**

MORE > Advanced, Const, Params > Settings, International English > Color, Adapter.

Use of standard terminology list and abbreviation list.

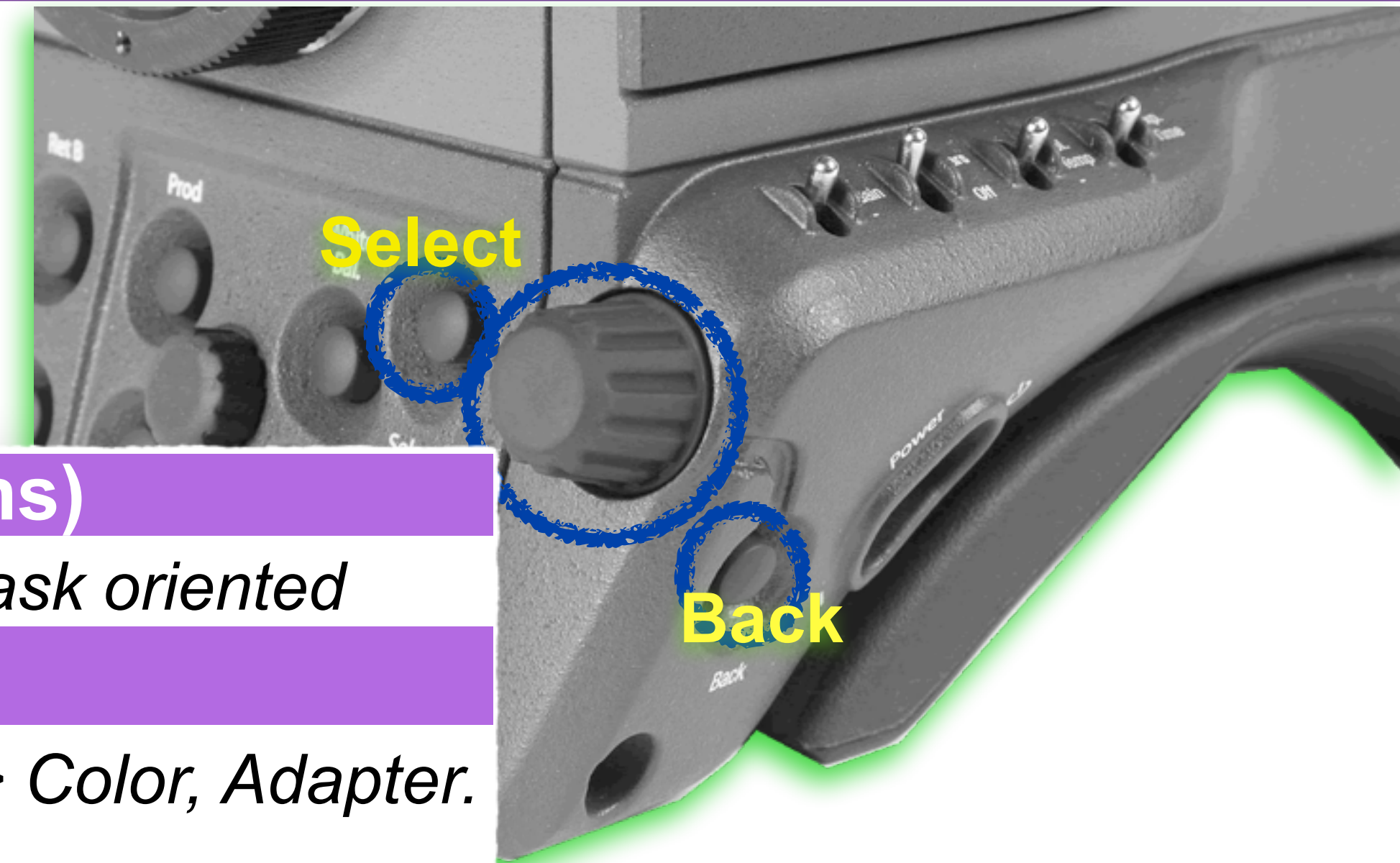
Use of correct units, ranges and values: mV, dB, %, -15..15, 0..100%.

- **Context help ?, Info Button.**

*Extra info, default values, constraints or errors are shown for the selected function.
info button to see full screen camera status.*

- **New function groups. (Camera menu)**

To reduce the amount of items and to increase clarity, we made new groups like Levels, Color, Sharpness, Image Control and Signals, IP Settings.



Menu Controls Camera/XCU/VF

The ArtTouch Menu

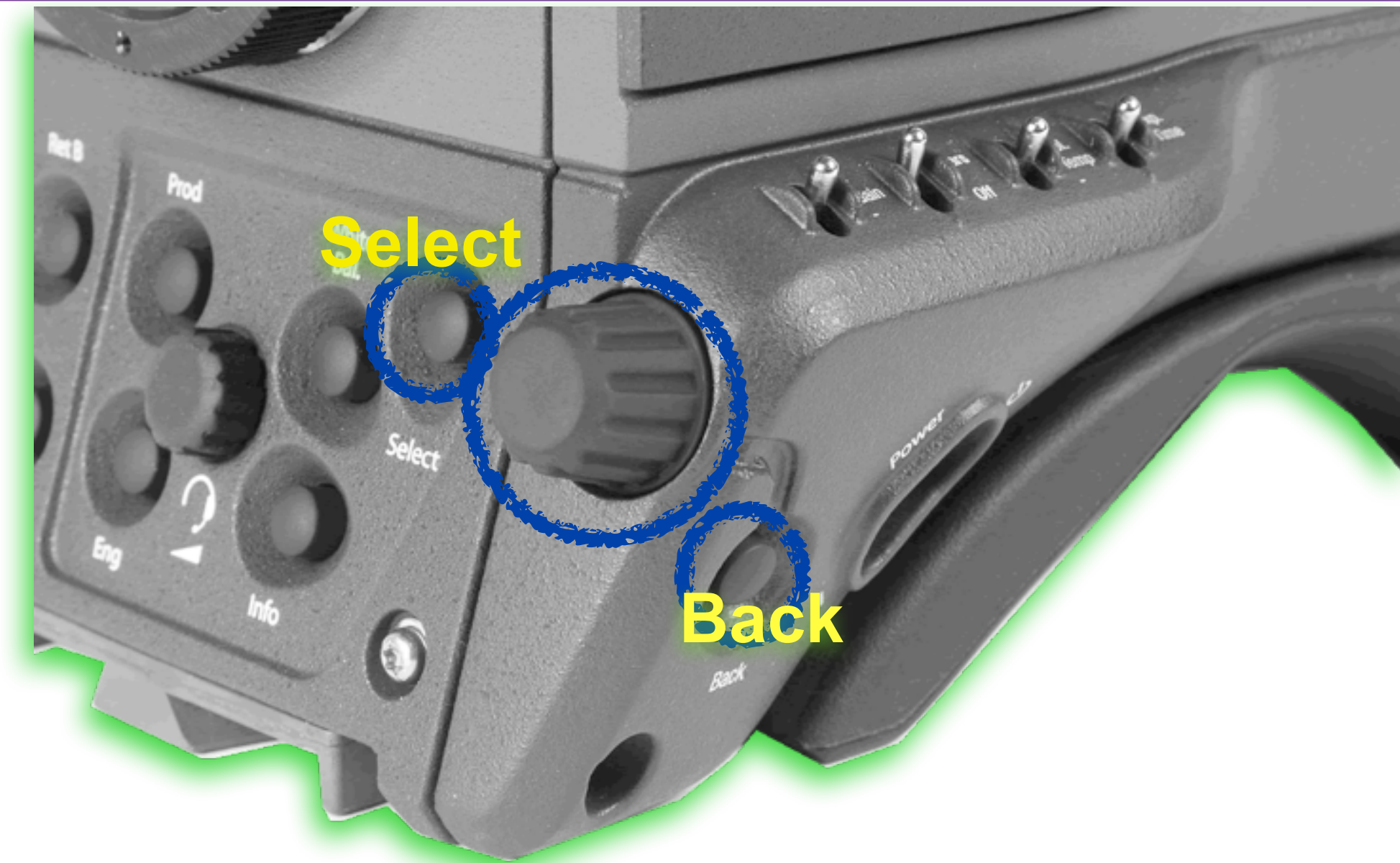
Practical user oriented Menu.

- Operator Toolbox
- Production setup
- Creative control
- Configuration
- Licenses
- Diagnostics
- Service

Accessibility User level dependent.

Service level.

Structure to be continued in OCP and future control devices



Menu Controls Camera/XCU/VF

• Operators Toolbox

Cameraman, shooting during live production.

Tools: PickMe button, improved ergonomics, more direct buttons, quick info and more...

• Production Setup

Video Operator, Shader sets up the scene to neutral/nominal ('baseline').

Tools: sensitivity mode, Powercurves, improved color control and more...

• Creative control

Video Director, defining "The Look" and the production features

Tools: Contrast control, Powercurves, more sharpness controls and more color controls

• Configuration

Technical engineer: camera maintenance and calibration, transmission, diagnostics

Tools: more diagnostics, grouped lens corrections and more...

• Licenses

Defining operational functional capability for the users and owners

• Diagnostics

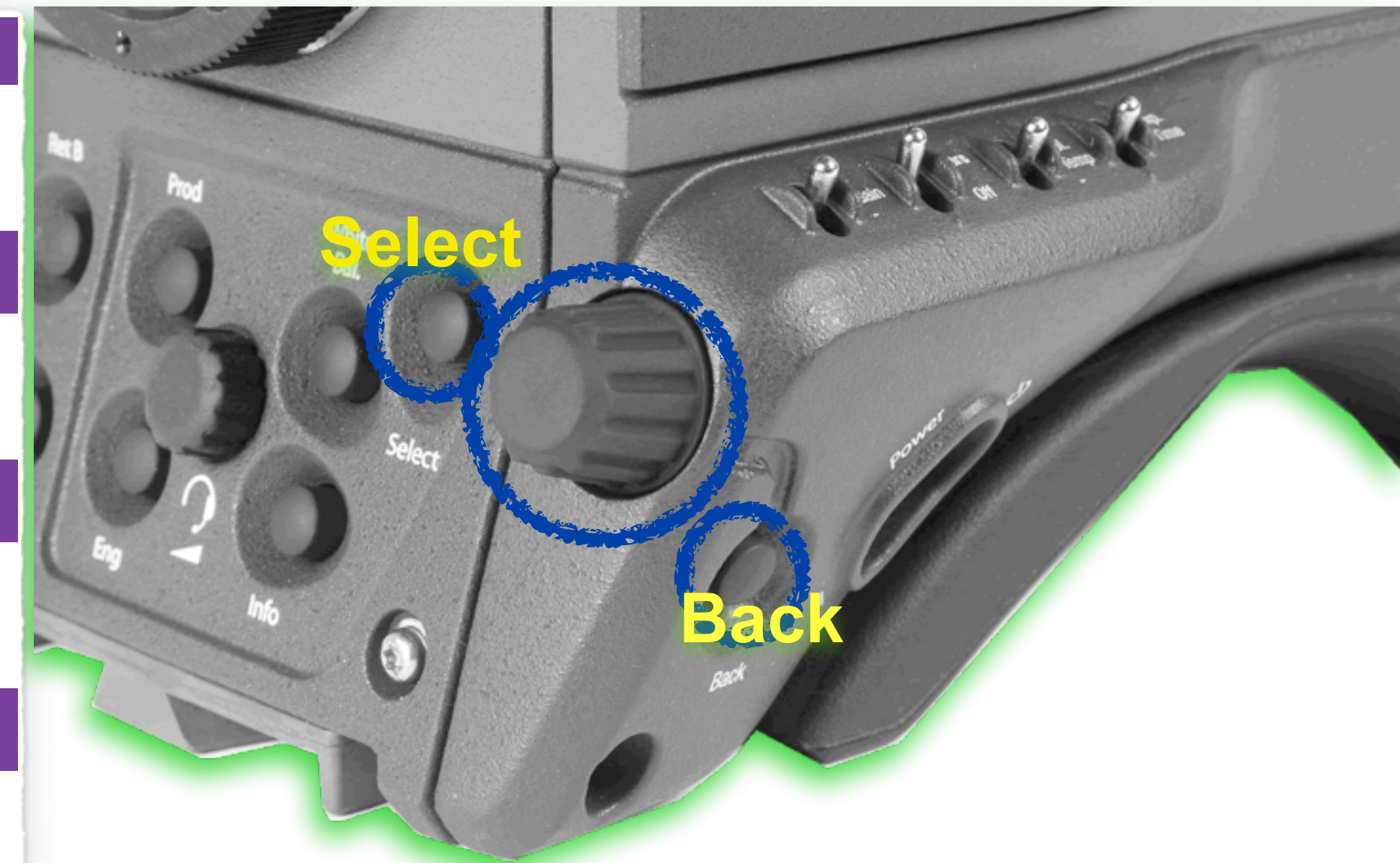
Service related information

Camera diagnostics,

Extensive diagnostic features to be added later

• Service

Service related information



Scenefile handling

Locations of the functions

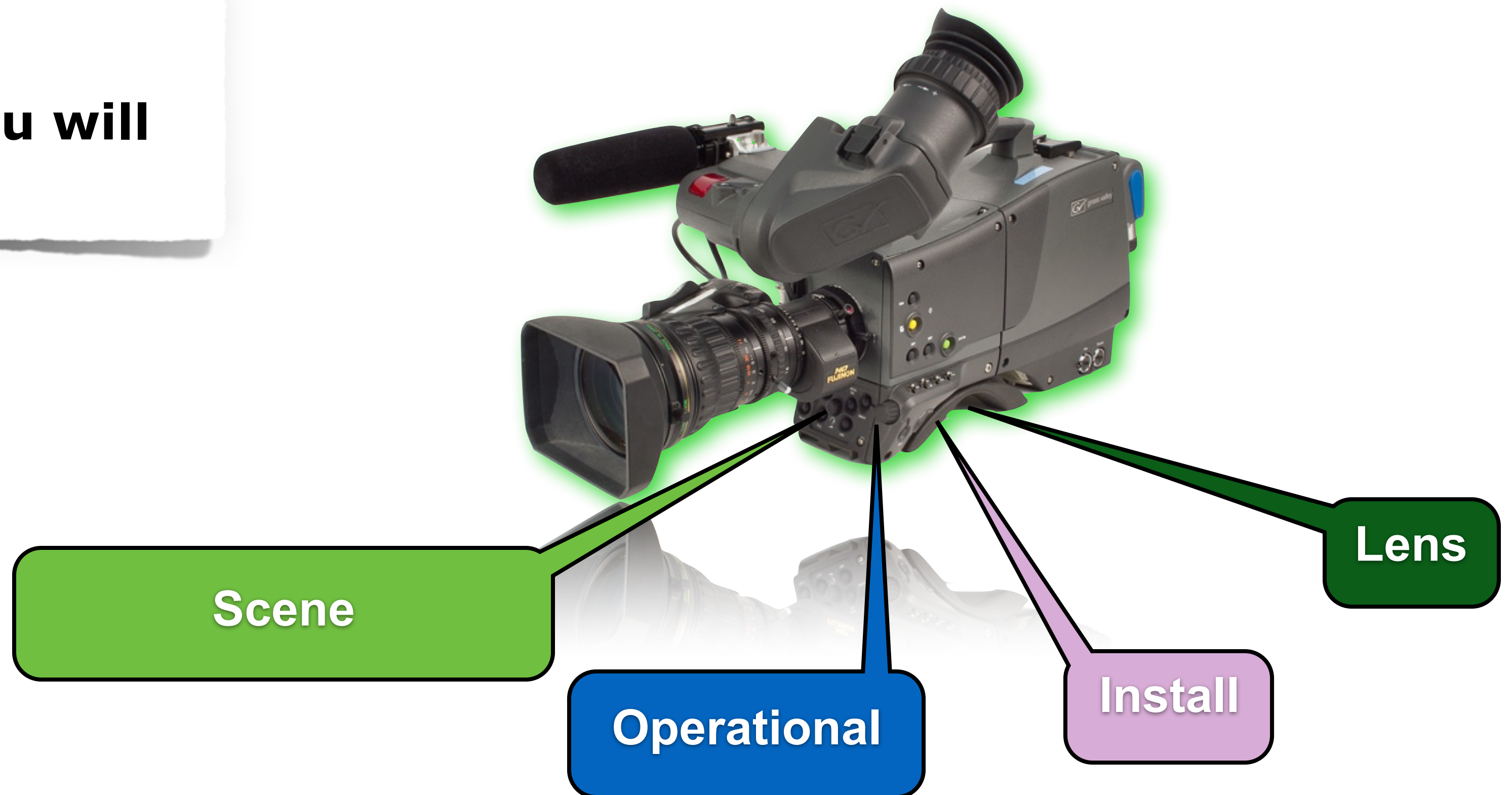
In the camera system (Head) you will find 4 different function groups

Scene

Operational

Install

Lens (not in 8000)



To simplify the controllable functions within the camera system
We created several function groups.

Grass Valley Cameras functions overview



Scene Video parameters	Gains
	Gamma
	Knee
	Details
	Black/Flare
	Colors/Matrix
Operational	VF settings
	Intercom
	Audio
	Diagnostics
Install	Video modes
	Timing
Lens	White Shading

Scene (Video)

In this group you will find all Video related items like:

Gains/Blacks/Gamma/Knee/Detail etc

Operational

In this group you will find all Operational related items like:

Viewfinder picture setting / Intercom / Audio etc.

Install

In this group you will find all Install related items like:

Video Modes / Timing etc


Lens

In this group you will find all Lens related items like:

White Shading / Lens setting etc.

Grass Valley Cameras functions overview



		Controls						STORE / RECALL		
		Camera Menu	XCU Menu	OCP Direct	Control via OCP menu		MCP	USB	CARD	USB
		CAM	XCU	OCP	CAM	XCU		CAM	OCP	MCP
Scene Video parameters	Gains									
	Gamma									
	Knee									
	Details									
	Black/Flare									
	Colors/Matrix									
Operational	VF settings									
	Intercom									
	Audio			Remote			Remote			
	Diagnostics			Basic			Basic			
Install	Video modes									
	Timing									
Lens	White Shading									

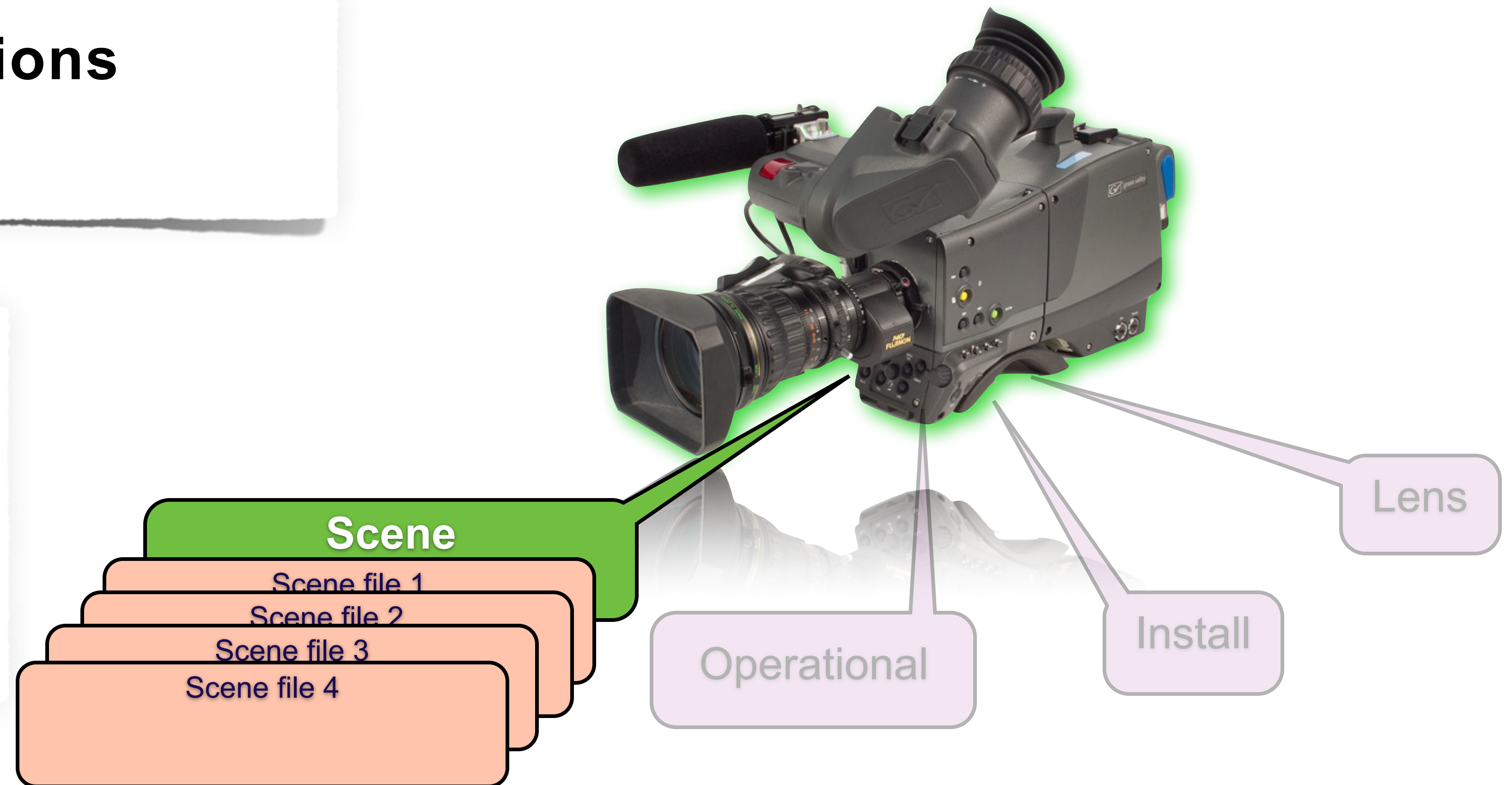
Scenefile handling

Locations of the functions
The Scene file group

Scene (Video)

In this group you will find all Video related items like:

Gains/Blacks/Gamma/Knee/Detail etc



It is possible to Store or Recall the settings from each group IN and OUTside the camera

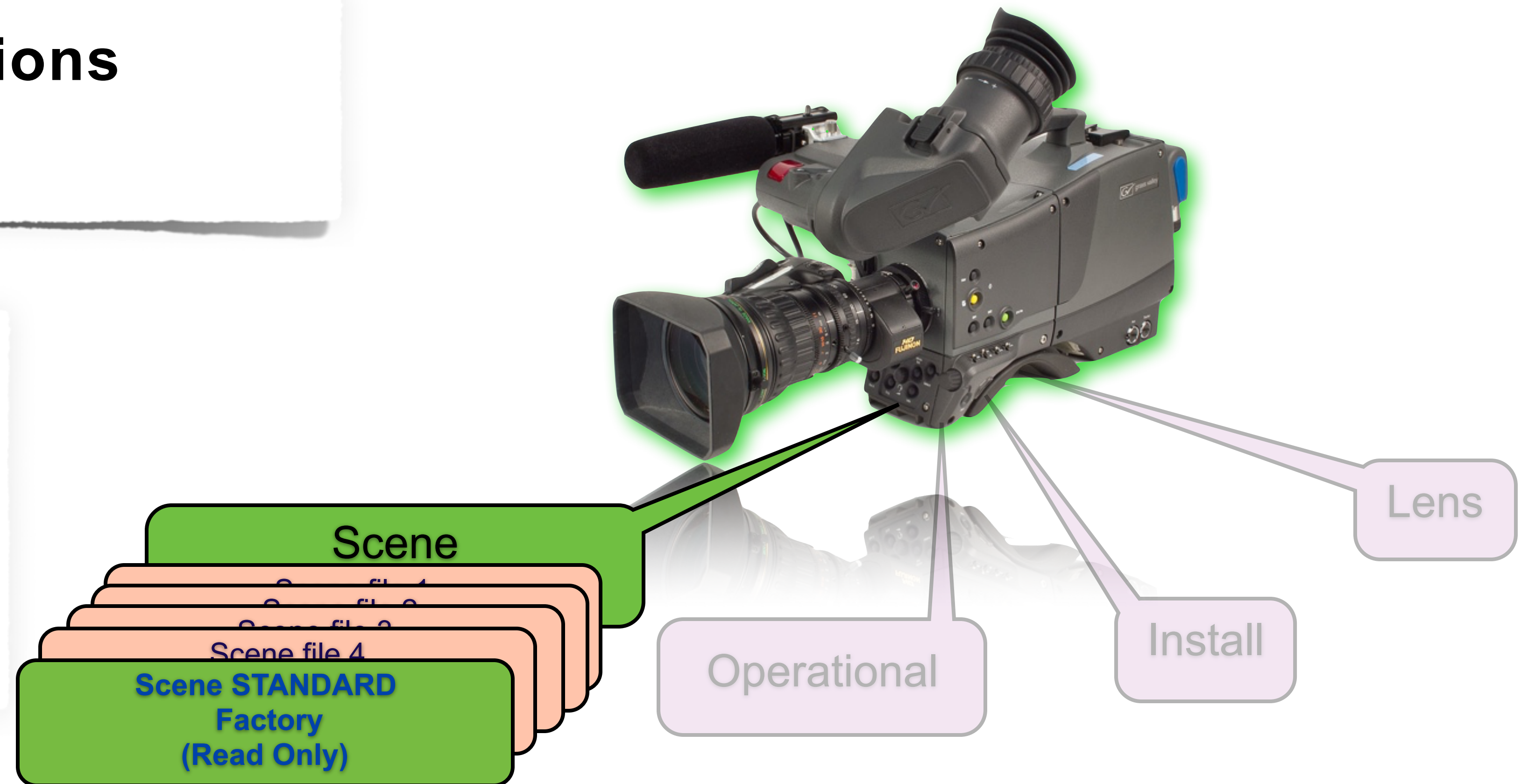
Scenefile handling

Locations of the functions The Scene file group

Scene

In this group you will find all
Video related items like:

Gains/Blacks/Gamma/Knee/Detail etc



More important is that inside the camera a function **STANDARD RECALL** is available

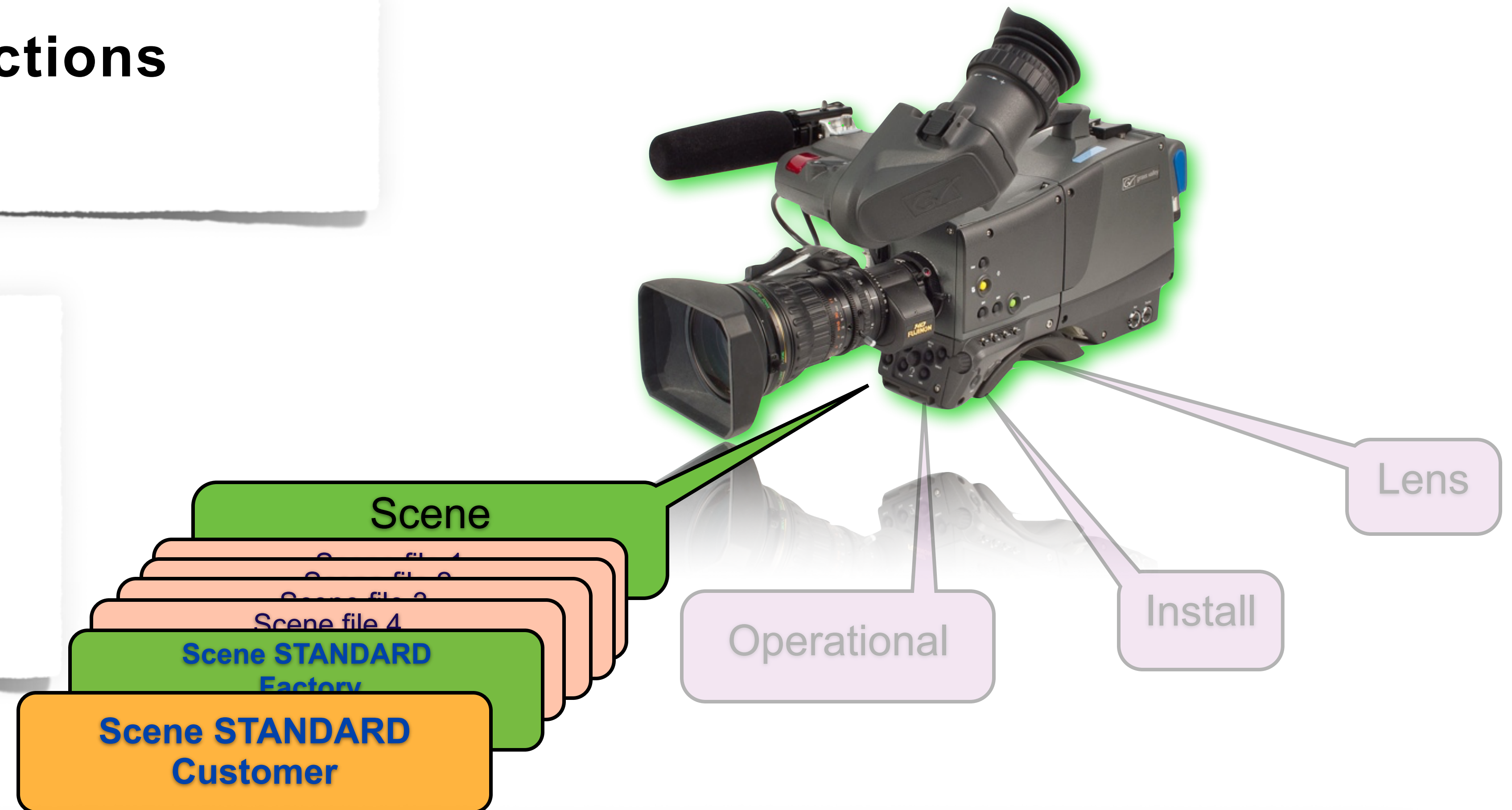
Scenefile handling

Locations of the functions The Scene file group

Scene

In this group you will find all
Video related items like:

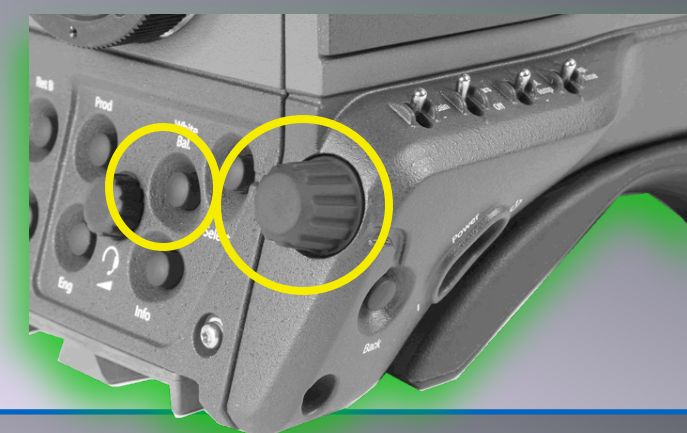
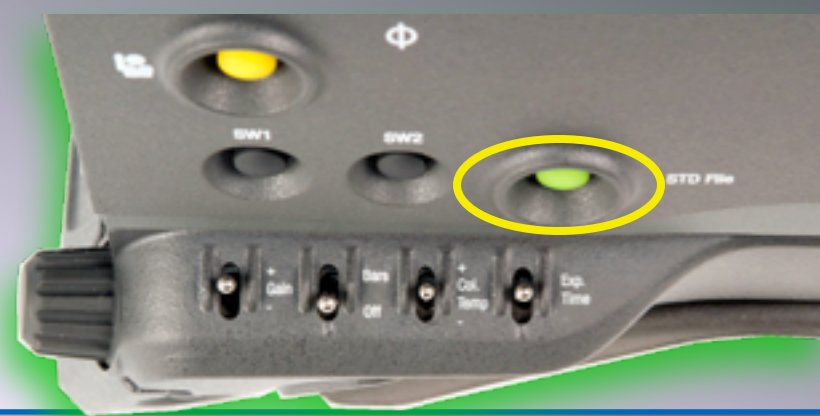
Gains/Blacks/Gamma/Knee/Detail etc



It is also possible to create your own **STANDARD** file (Customer Store / Recall)

Scenefile handling

Basic SETUP procedure



Step

Camera sw. panel
User level 2,3

Menu Camera
User level 2,3

OCP or MCP

A

Standard Recall
GREEN Button

MenuFiles
Standard Recall

Standard Recall
FACTORY

B

Select AW1 or 2

Auto White

AW 1 / Auto White

C

IRIS

IRIS + MBlack

D

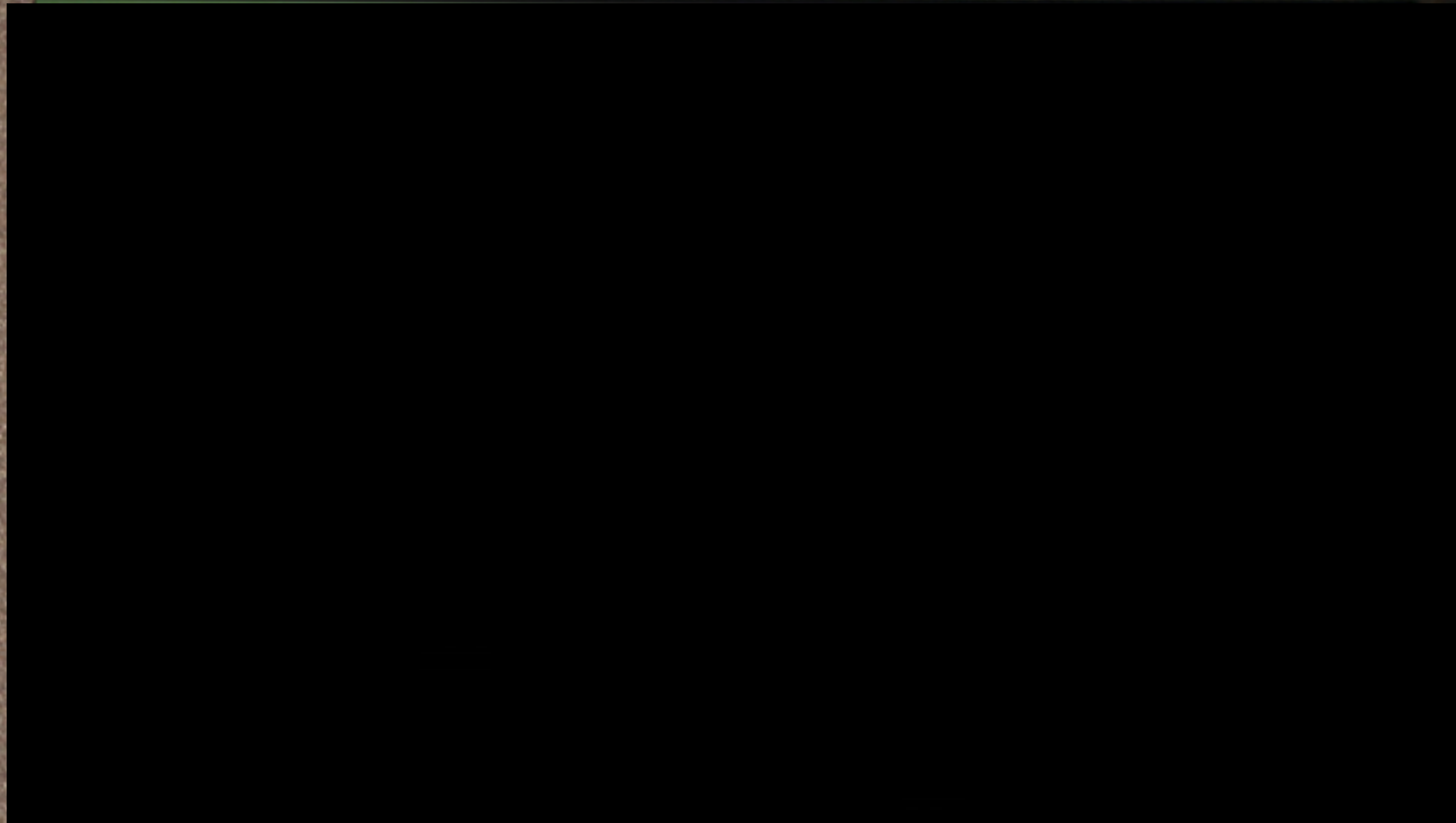
MenuVideo
Flare

Flare

Generic Operational Controls

part 2 Web Training

ABC Rule Standard setting



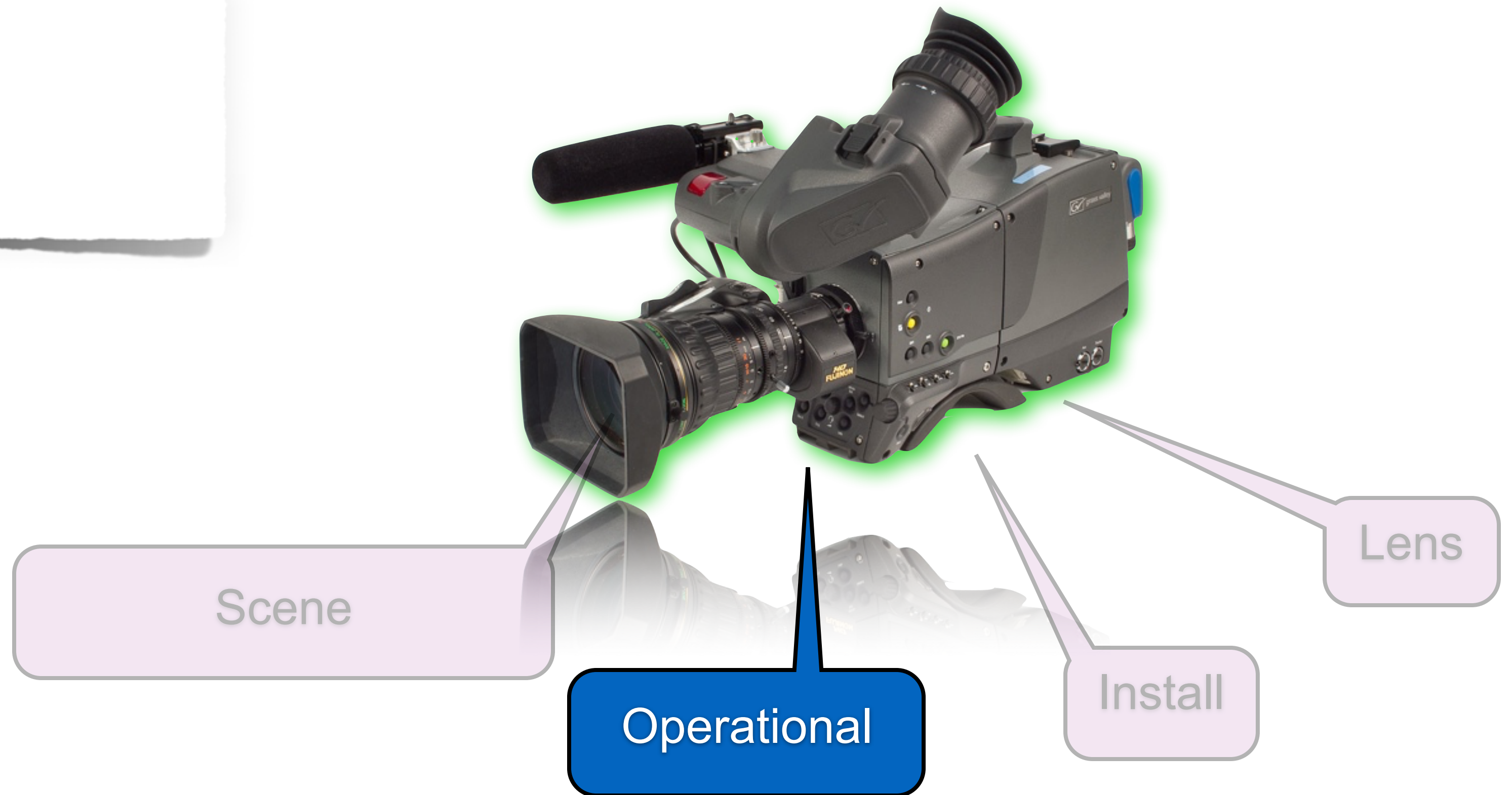
Operational file handling

Locations of the functions
The Operational file group

Operational

**In this group you will find all
Operational related items like:**

**Viewfinder picture setting / Intercom /
Audio etc.**



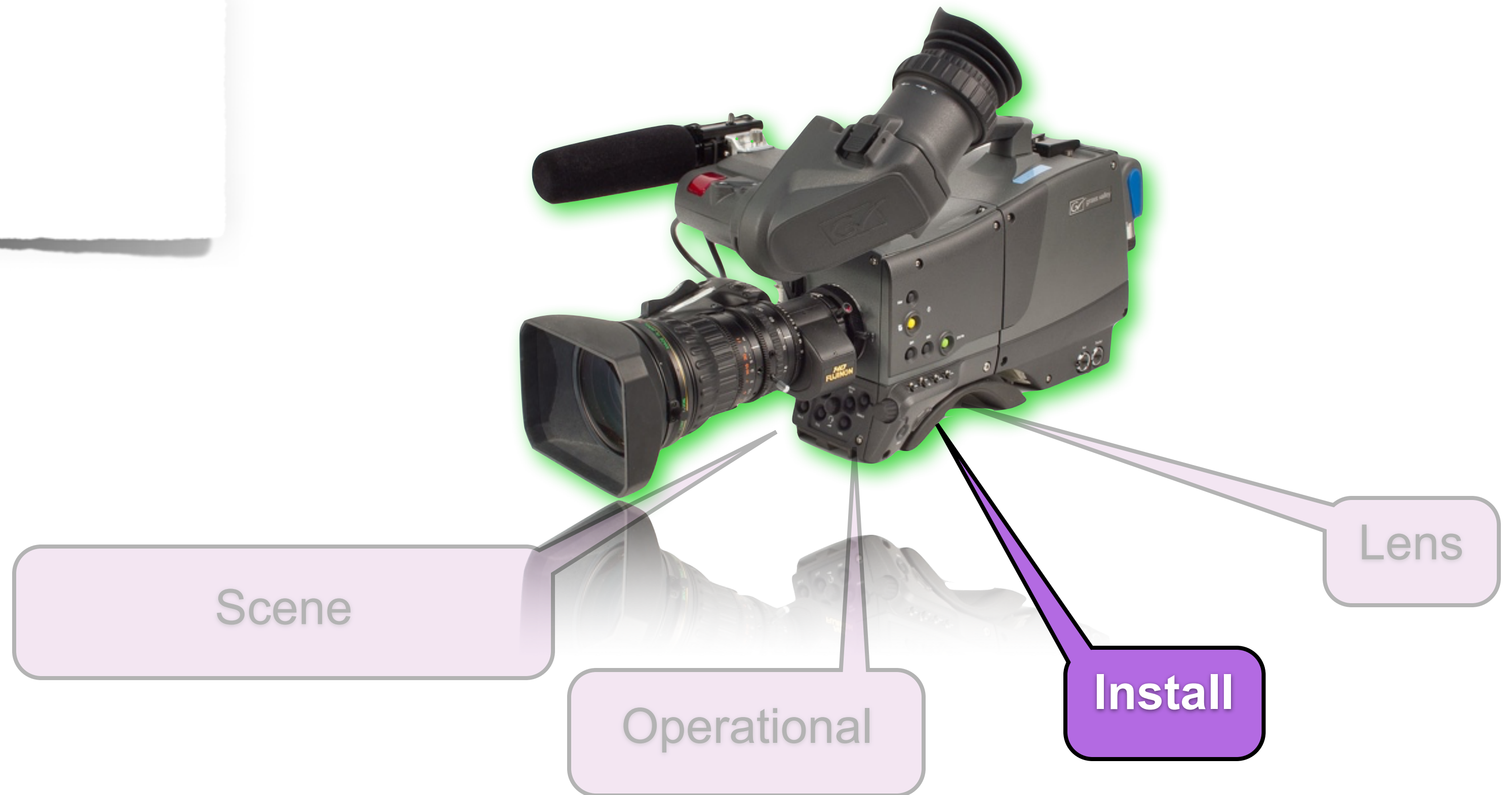
Install file handling

Locations of the functions The Install file group

Install

In this group you will find all
Install related items like:

Video Modes / Timing etc



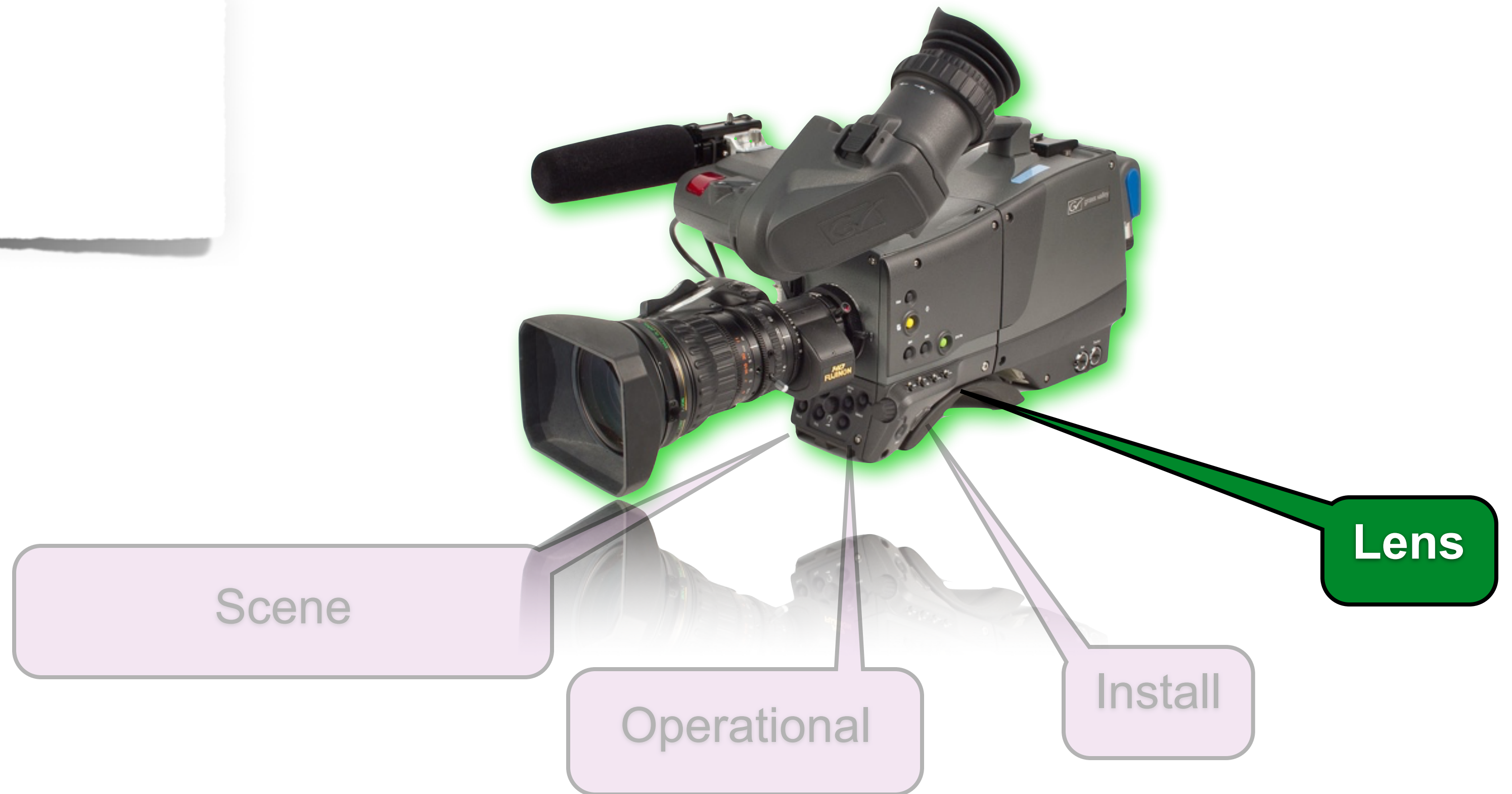
Lens file handling (not for LDK8000)

Locations of the functions The Lens file group

Lens

In this group you will find all
Lens related items like:

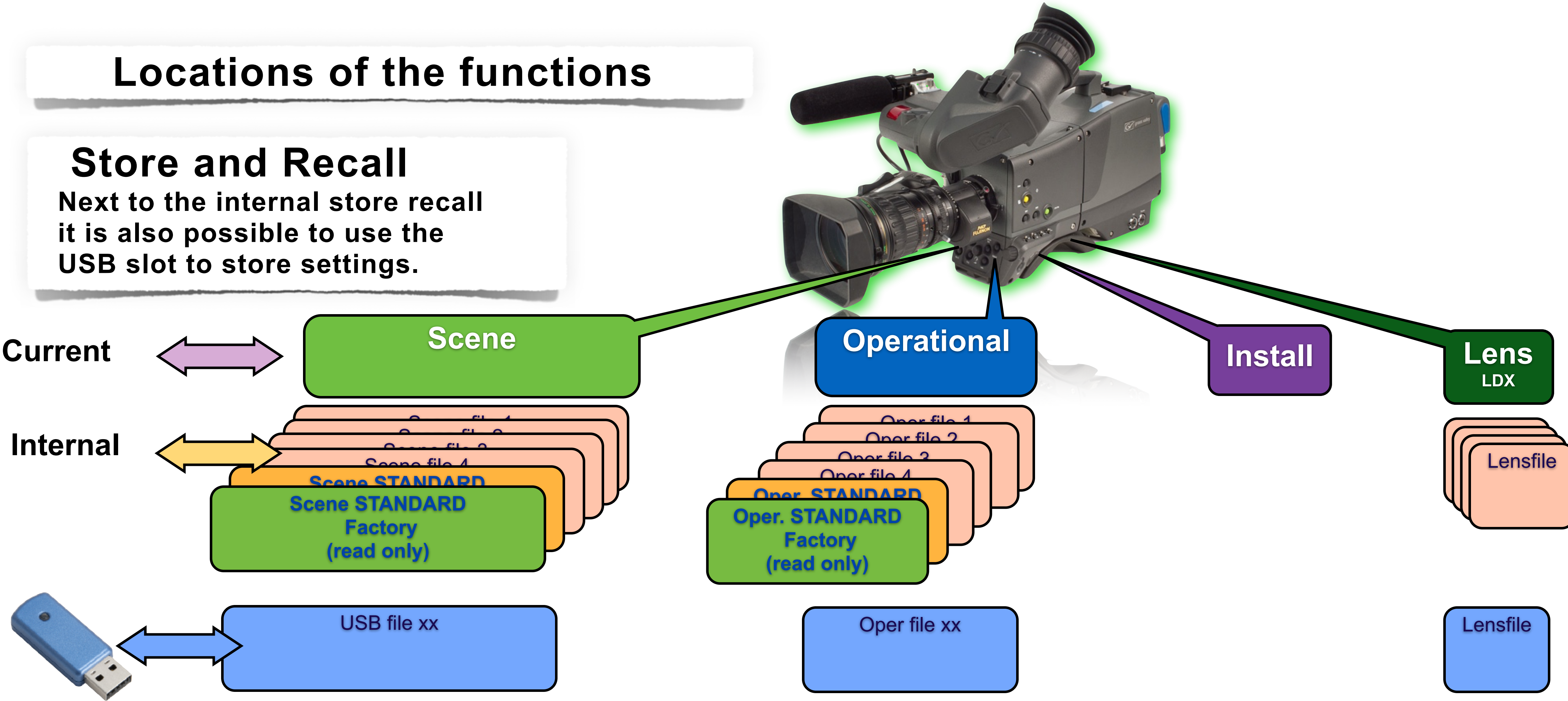
White Shading / Lens setting etc.



File handling

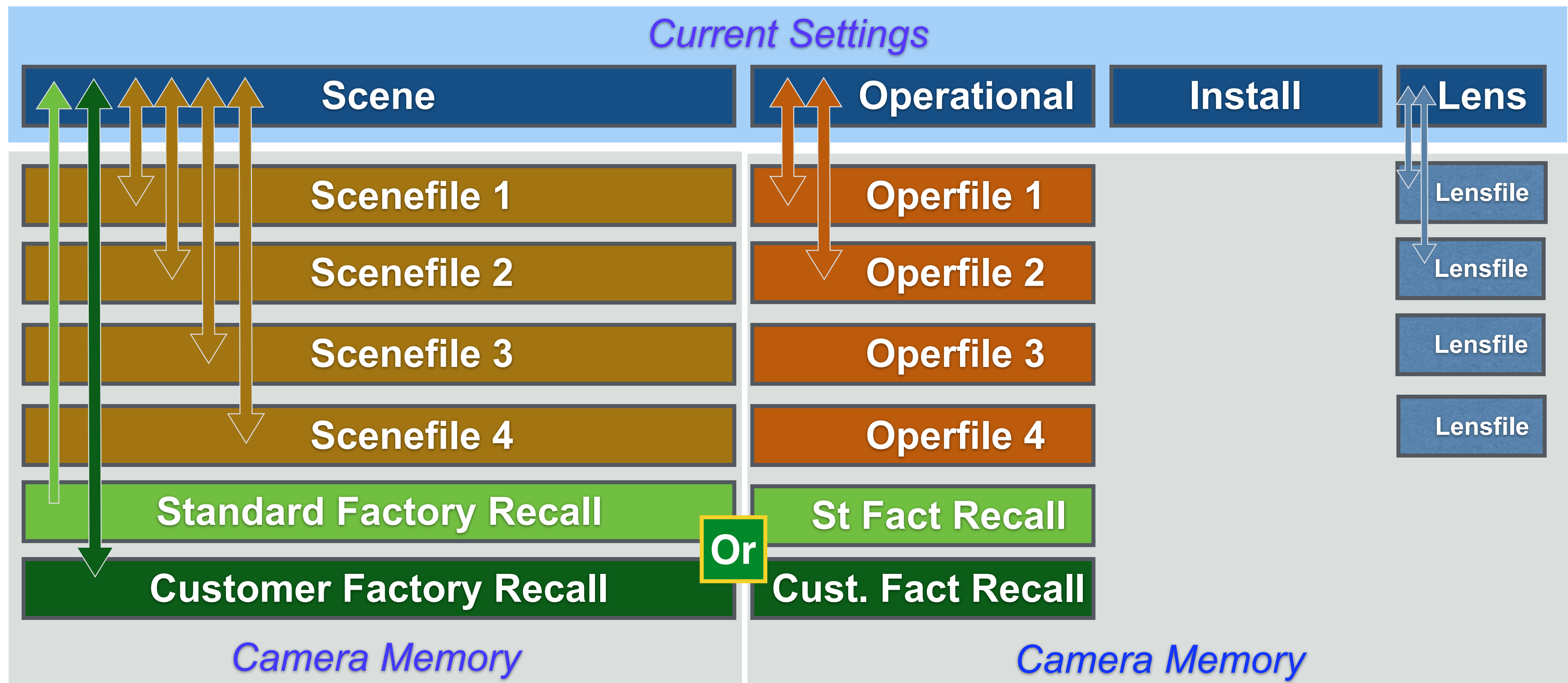
Locations of the functions

Store and Recall
Next to the internal store recall it is also possible to use the USB slot to store settings.



Generic Operational Controls (File-handling)

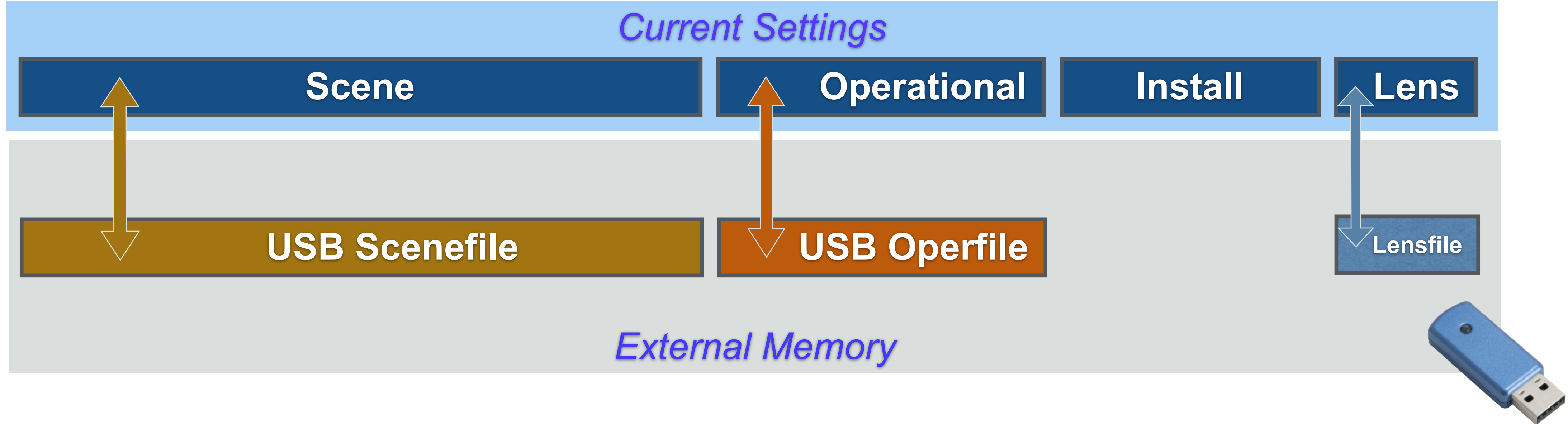
— In camera function parameter



Generic Operational Controls (File-handling)

part 2 Web Training

■ In camera function parameter



Scenefile 1

Video parameter Camera

Operfile 1

Operational parameter Camera

Lensfile

Lens parameter Camera

Grass Valley Cameras File handling

		STORE / RECALL		
		USB	Smart CARD	USB
		CAM	OCP	MCP450
Scene Video parameters	Gains			
	Gamma			
	Knee			
	Details			
	Black/Flare			
	Colors/Matrix			
Operational	VF settings			
	Intercom			
	Audio			
	Diagnostics			
Install	Video modes			
	Timing			
Lens	White Shading			

Available

Not accessible

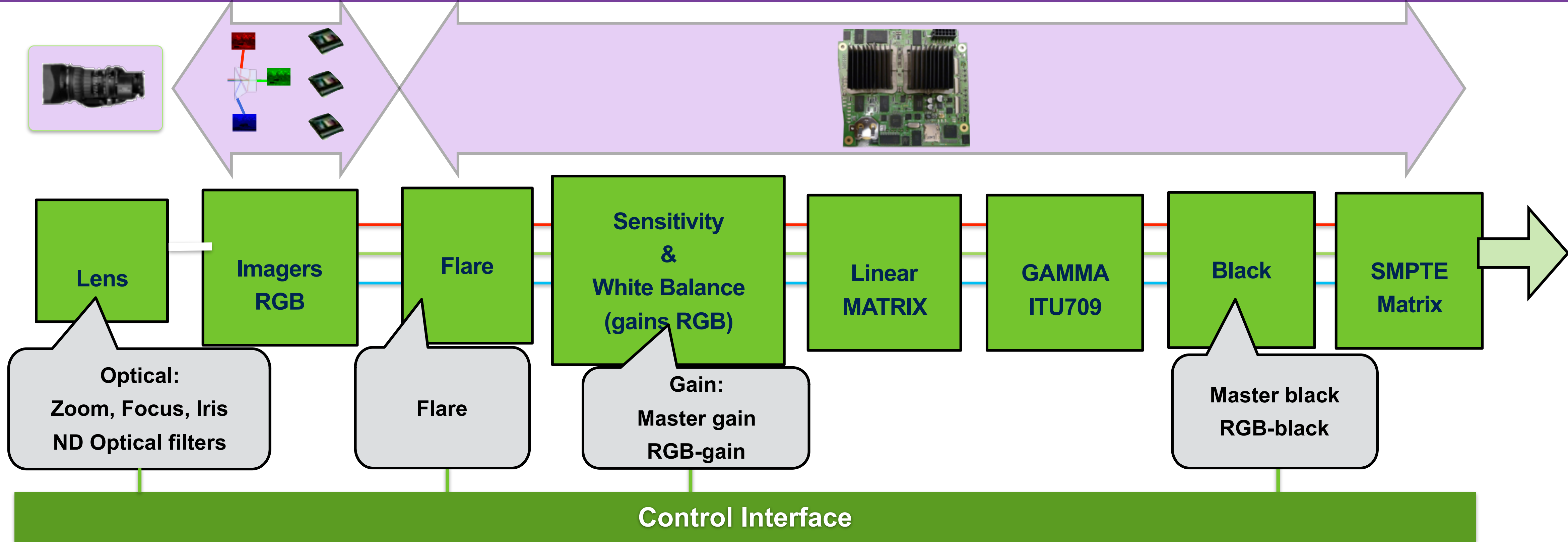
Grass Valley Cameras File handling

Tryout

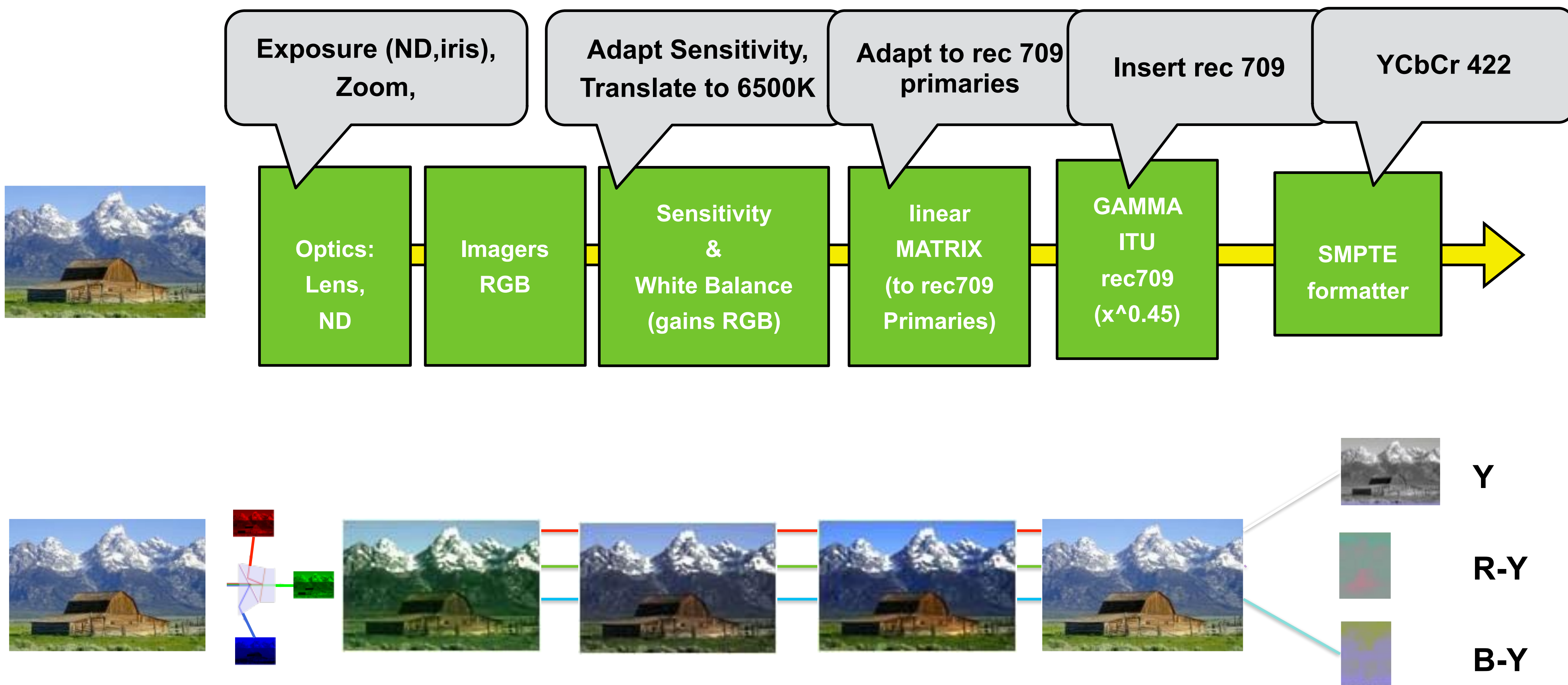
		STORE / RECALL		
		USB	Smart CARD	USB
		CAM	OCP	MCP450
Scene Video parameters	Gains			
	Gamma			
	Knee			
	Details			
	Black/Flare			
	Colors/Matrix			
Operational	VF settings			
	Intercom			
	Audio			
	Diagnostics			
Install	Video modes			
	Timing			
Lens	White Shading			

In Camera memory					
SCAM1	SCAM2	SCAM3	SCAM4	Standard	Custom
Scene					
OCAM1	OCAM2	OCAM3	OCAM4	Standard	Custom
Operational					

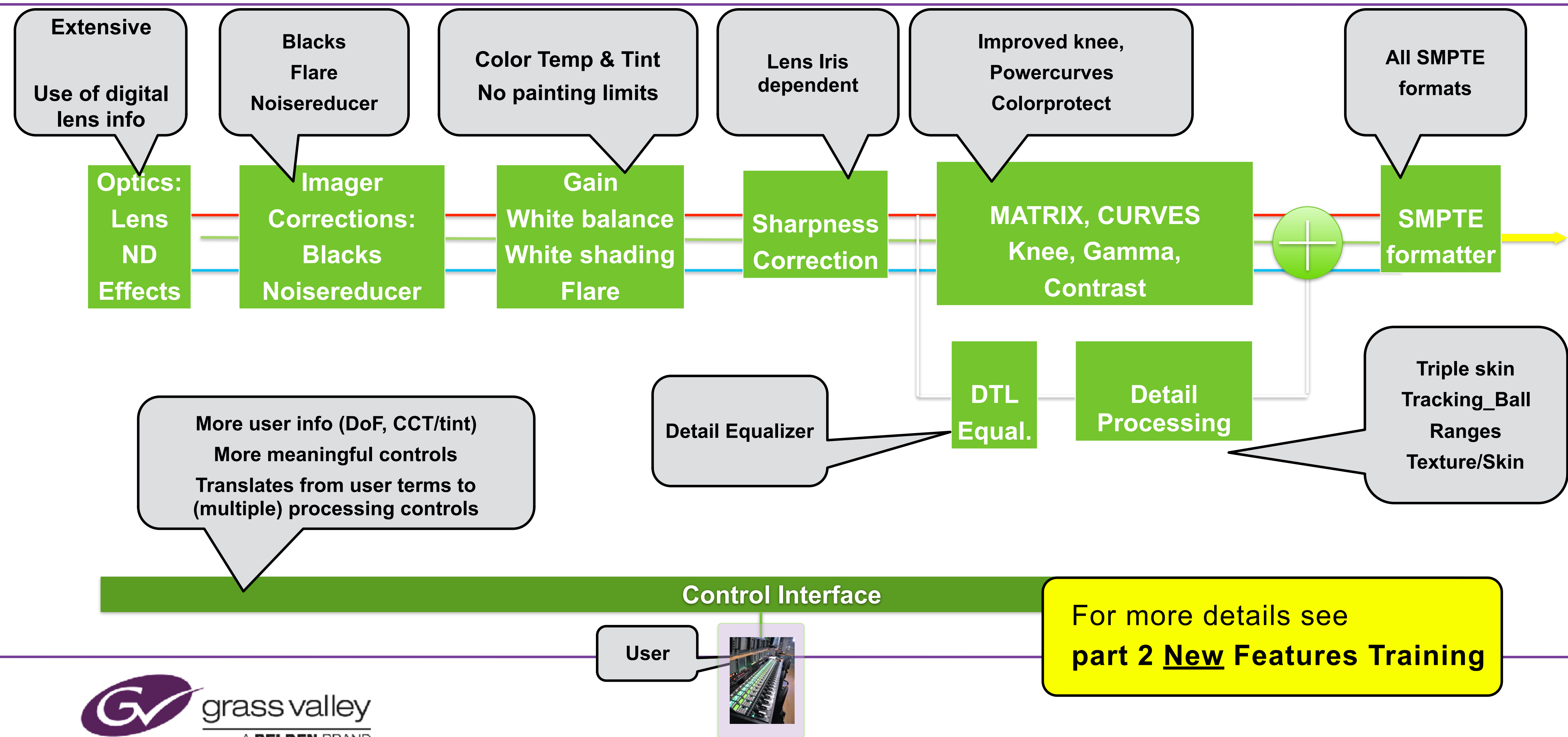
Generic Operational Controls (Overview)



Generic Operational Controls (Overview)



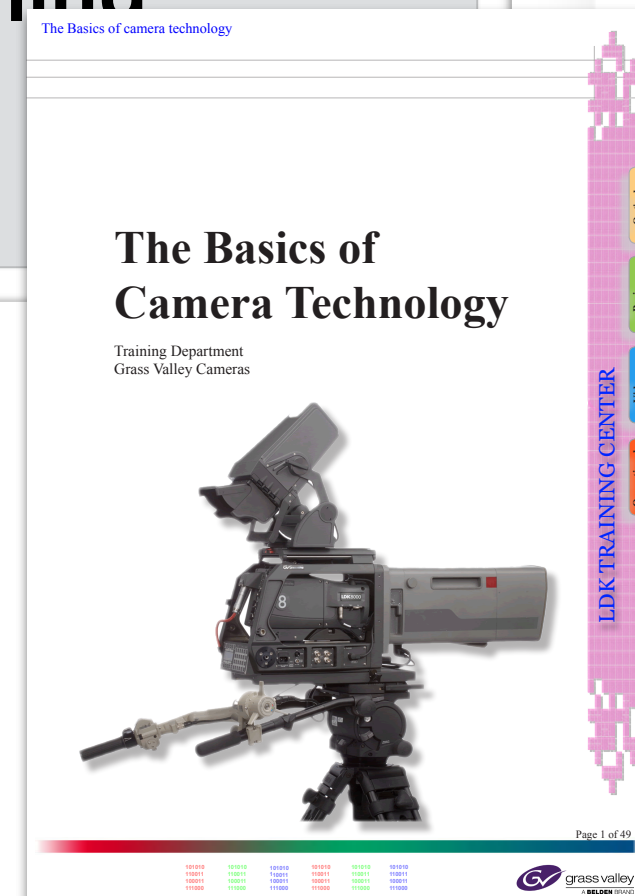
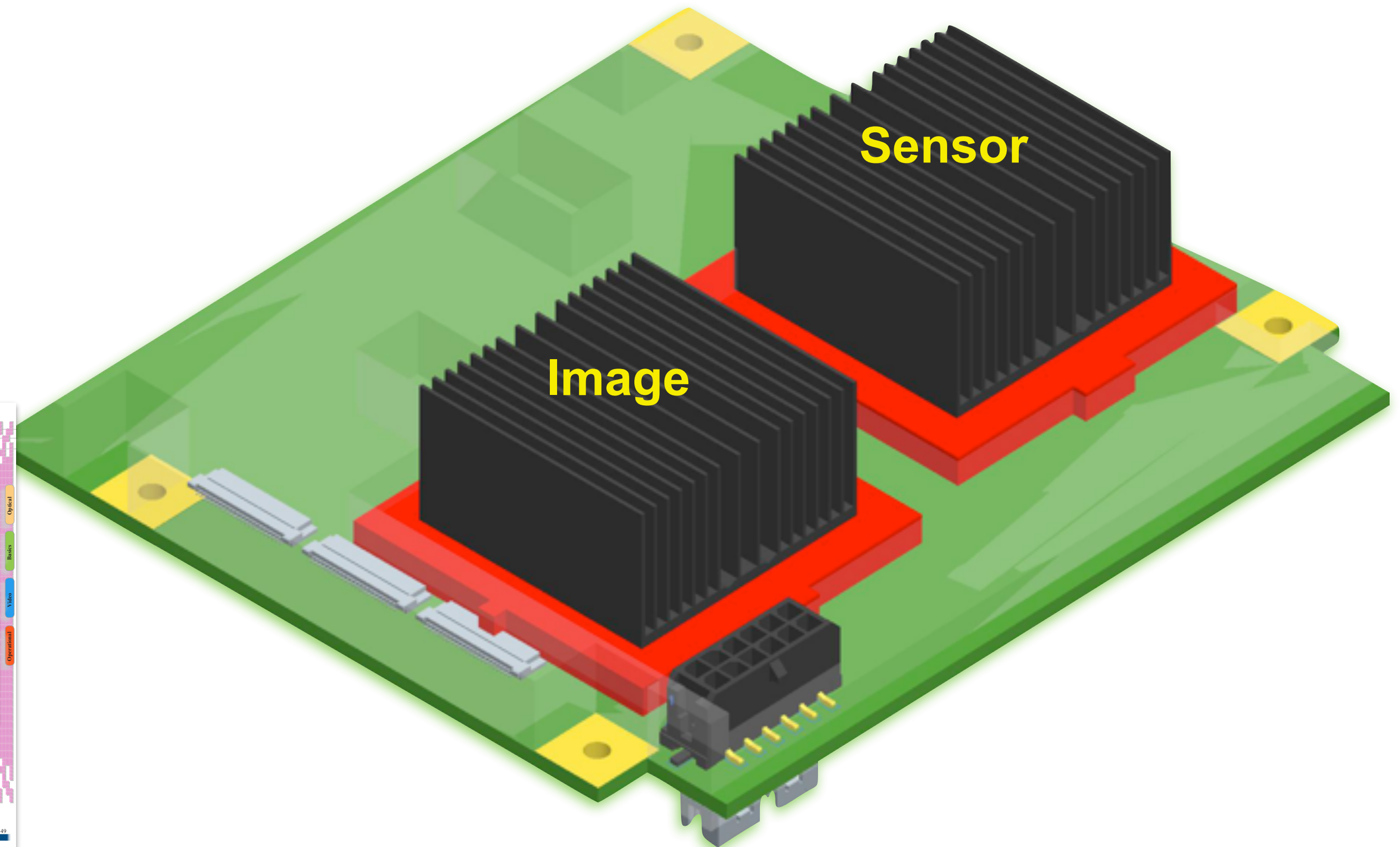
Generic Operational Controls (and More)



- The following slides are about the basic Video parameter.
- Basic camera experience is mandatory in order to follow the training sessions.
- For more details.

Use Basics Camera Training

Right Processor board LDX

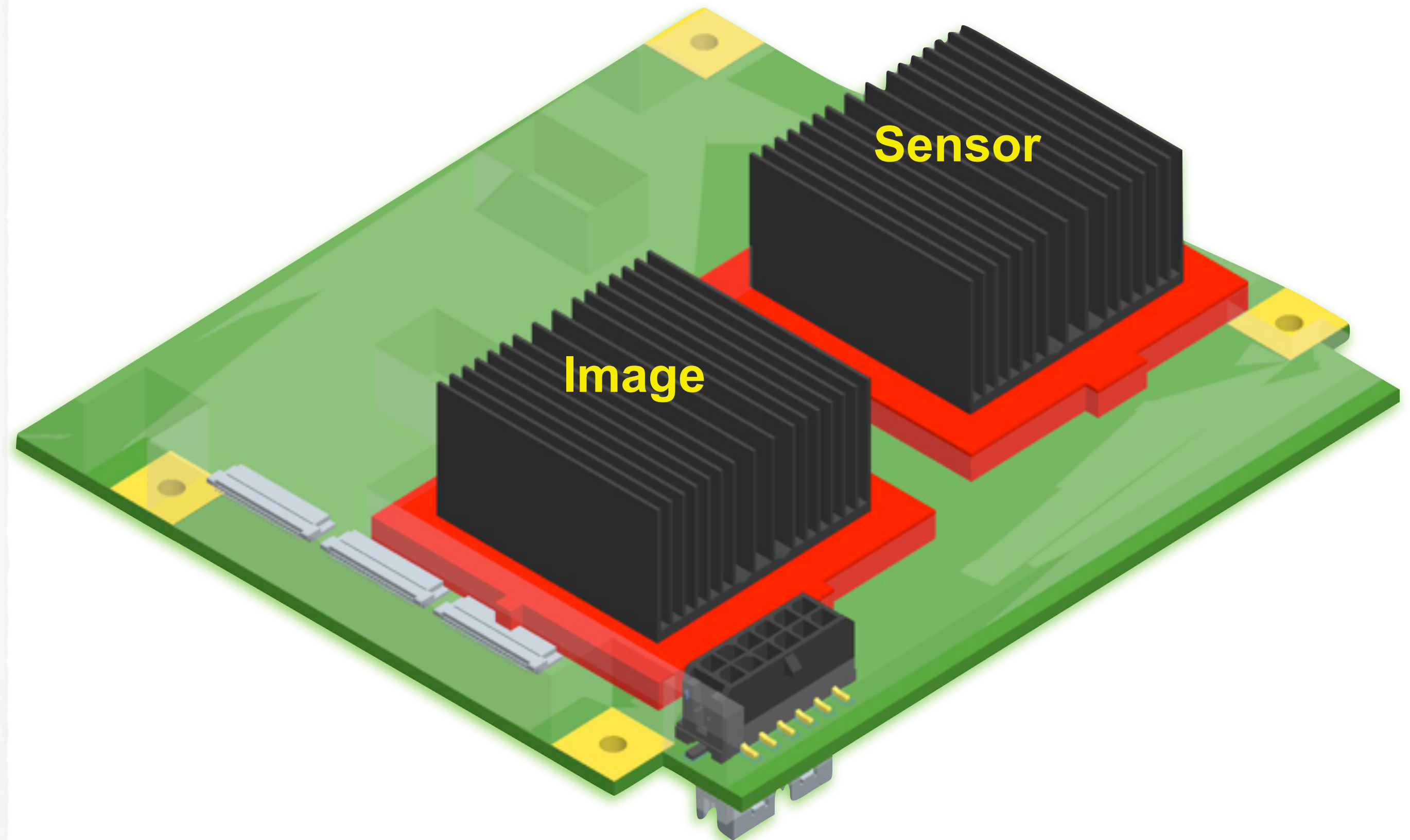


Functional LDX series

- **Gamma**
- **Knee**
- **Black Stretch**
- **Detail**
- **Color correction**
- **Flare**
- **White Shading**
- **Matrix**
- **RGB to Y/R-Y/B-Y**

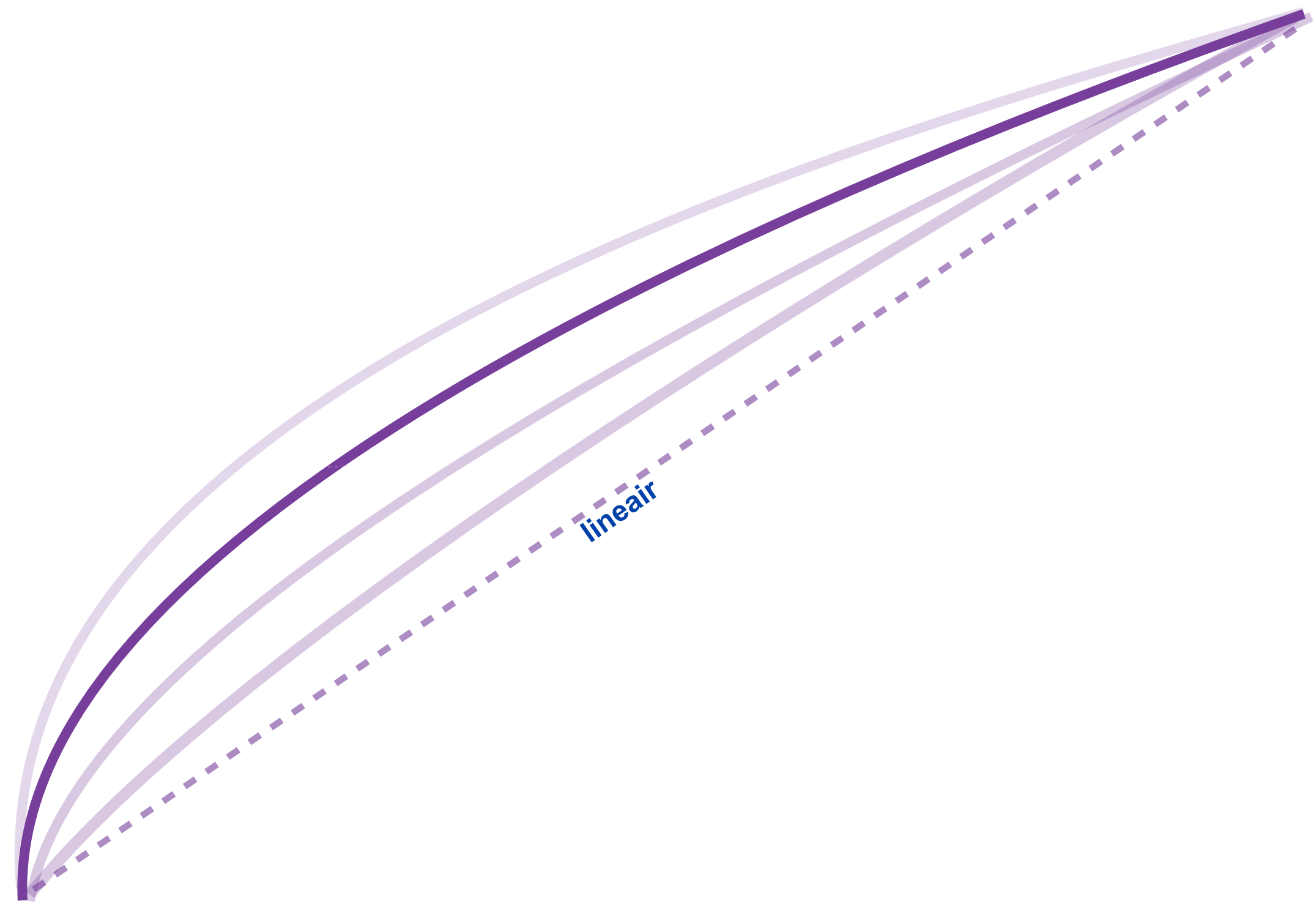
Basics Video / Image processing

Right Processor board LDX



- **Gamma**
- *Knee*
- *Black Stretch*
- *Detail*
- *Color correction*
- *Flare*
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Gamma Curve

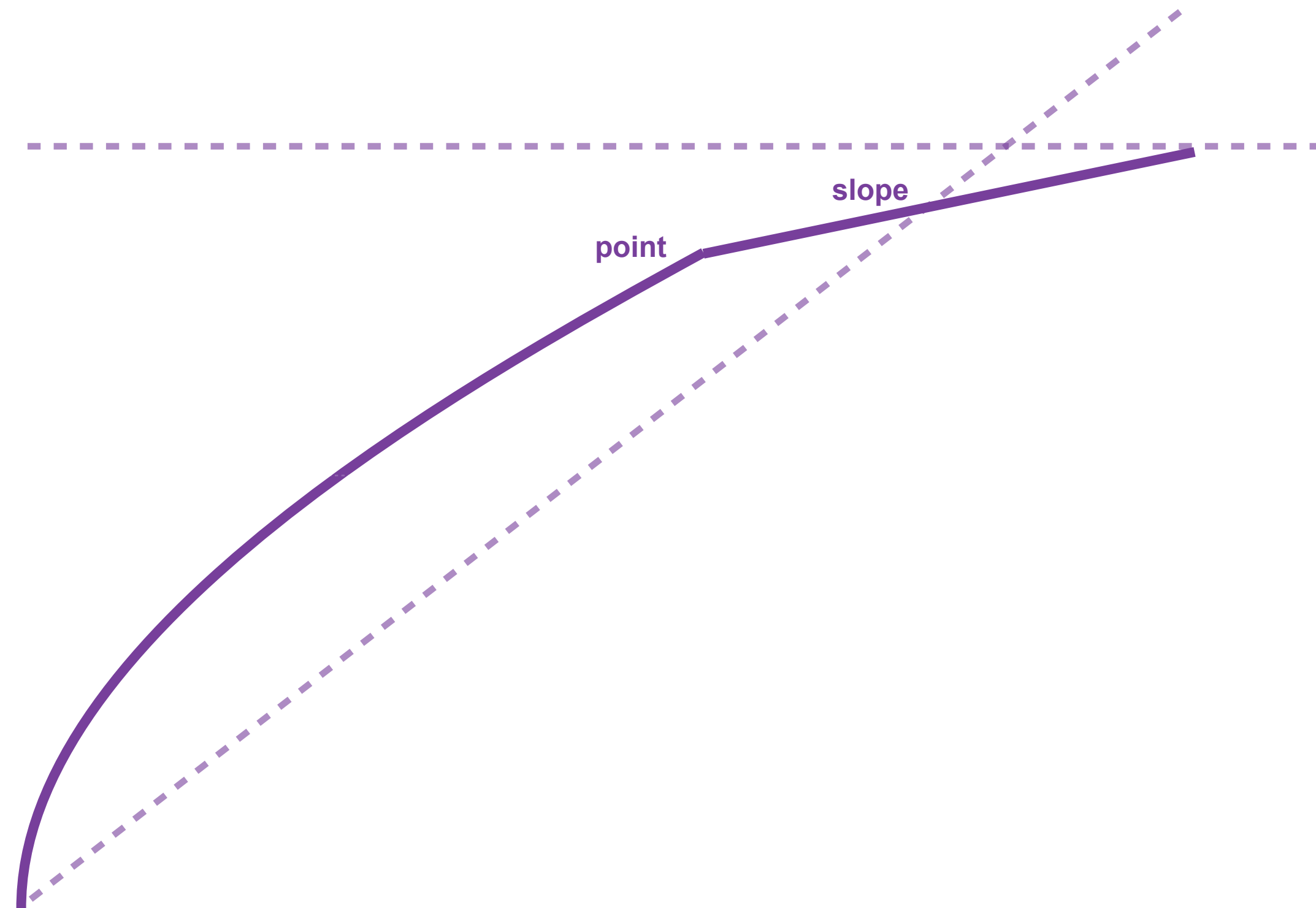


Functional LDX series

- *Gamma*
- **Knee**
- *Black Stretch*
- *Detail*
- *Color correction*
- *Flare*
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

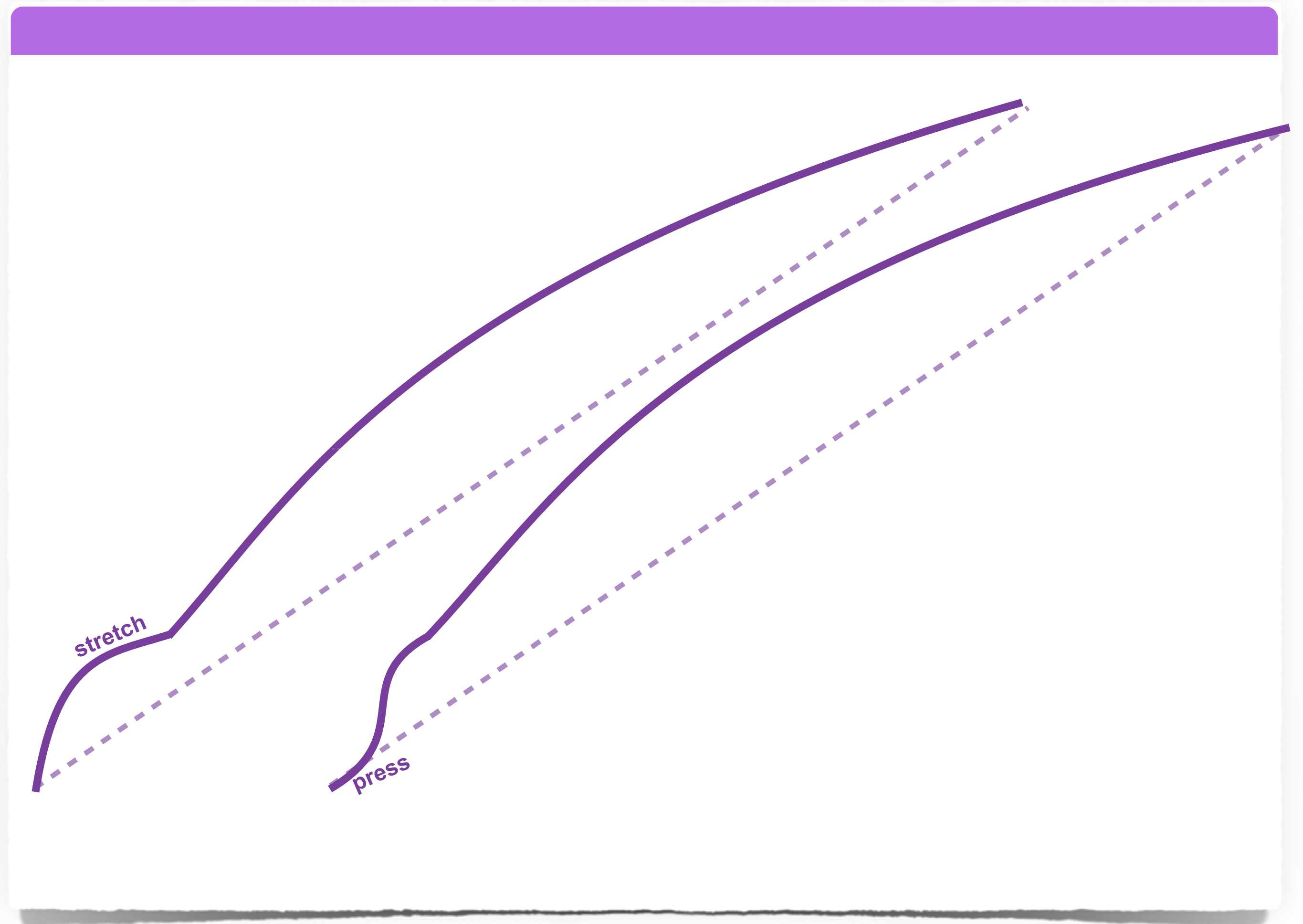
Knee



Functional LDX series

- *Gamma*
- *Knee*
- **Black Stretch**
- *Detail*
- *Color correction*
- *Flare*
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

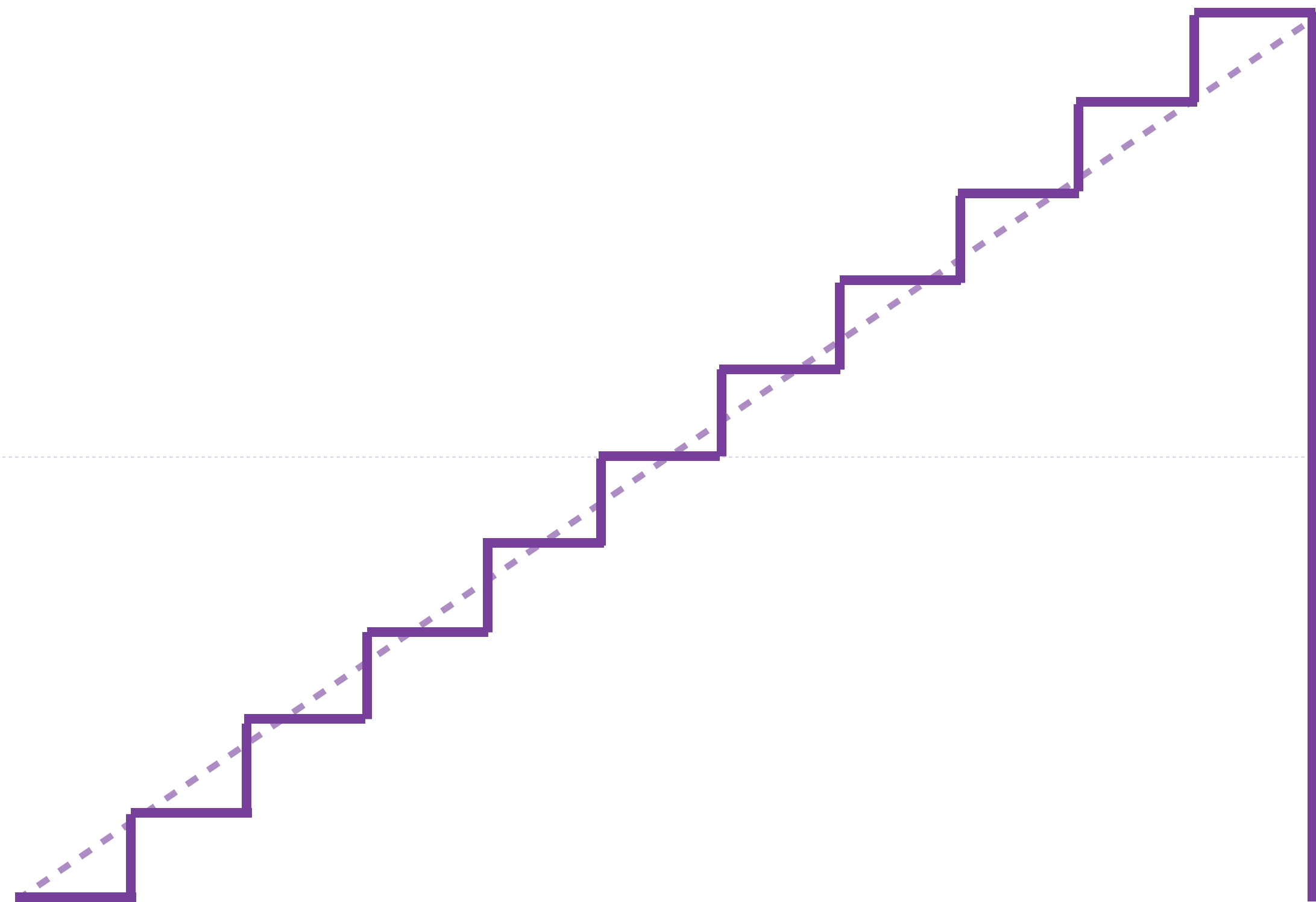


Functional LDX series

- *Gamma*
- *Knee*
- *Black Stretch*
- **Detail Off**
- *Color correction*
- *Flare*
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

Detail OFF

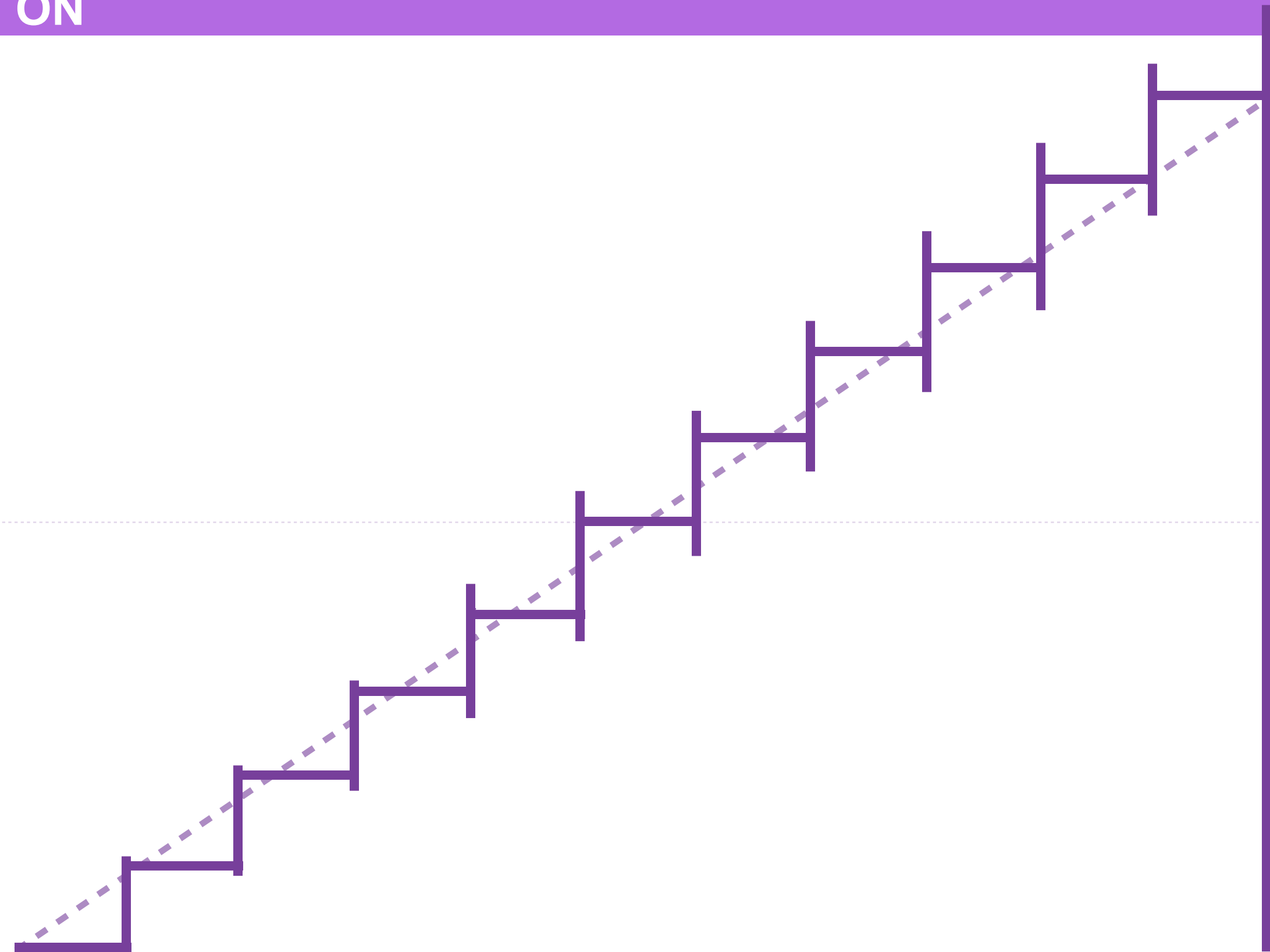


Functional LDX series

- *Gamma*
- *Knee*
- *Black Stretch*
- **Detail ON**
- *Color correction*
- *Flare*
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

Detail ON

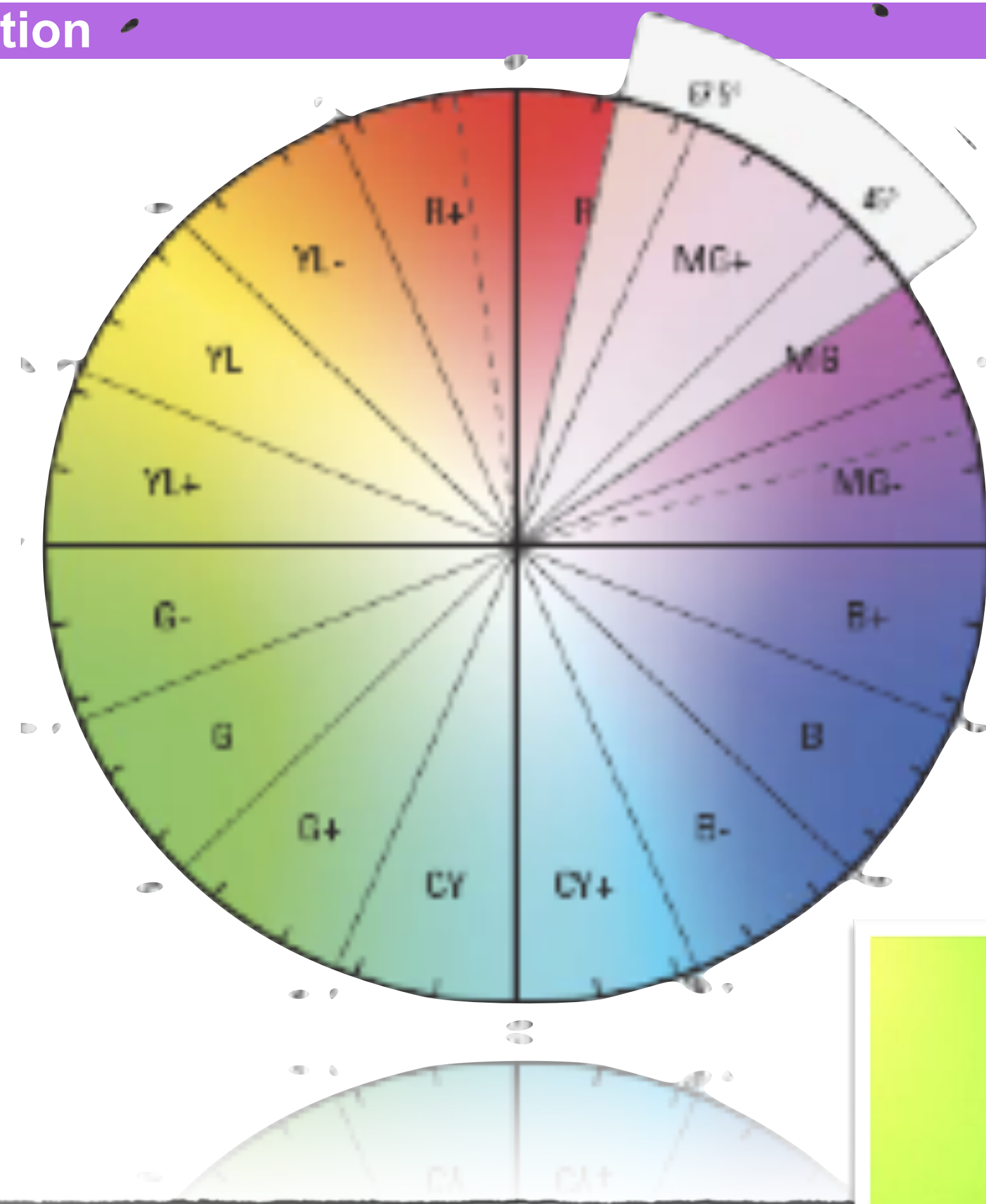


Functional LDX series

- *Gamma*
- *Knee*
- *Black Stretch*
- *Detail*
- **Color correction**
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Basics Video / Image processing

Color Correction



Functional LDX series

- *Gamma*
- *Knee*
- *Black Stretch*
- *Detail*
- *Color correction*
- **Flare**
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

Flare

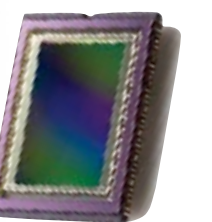
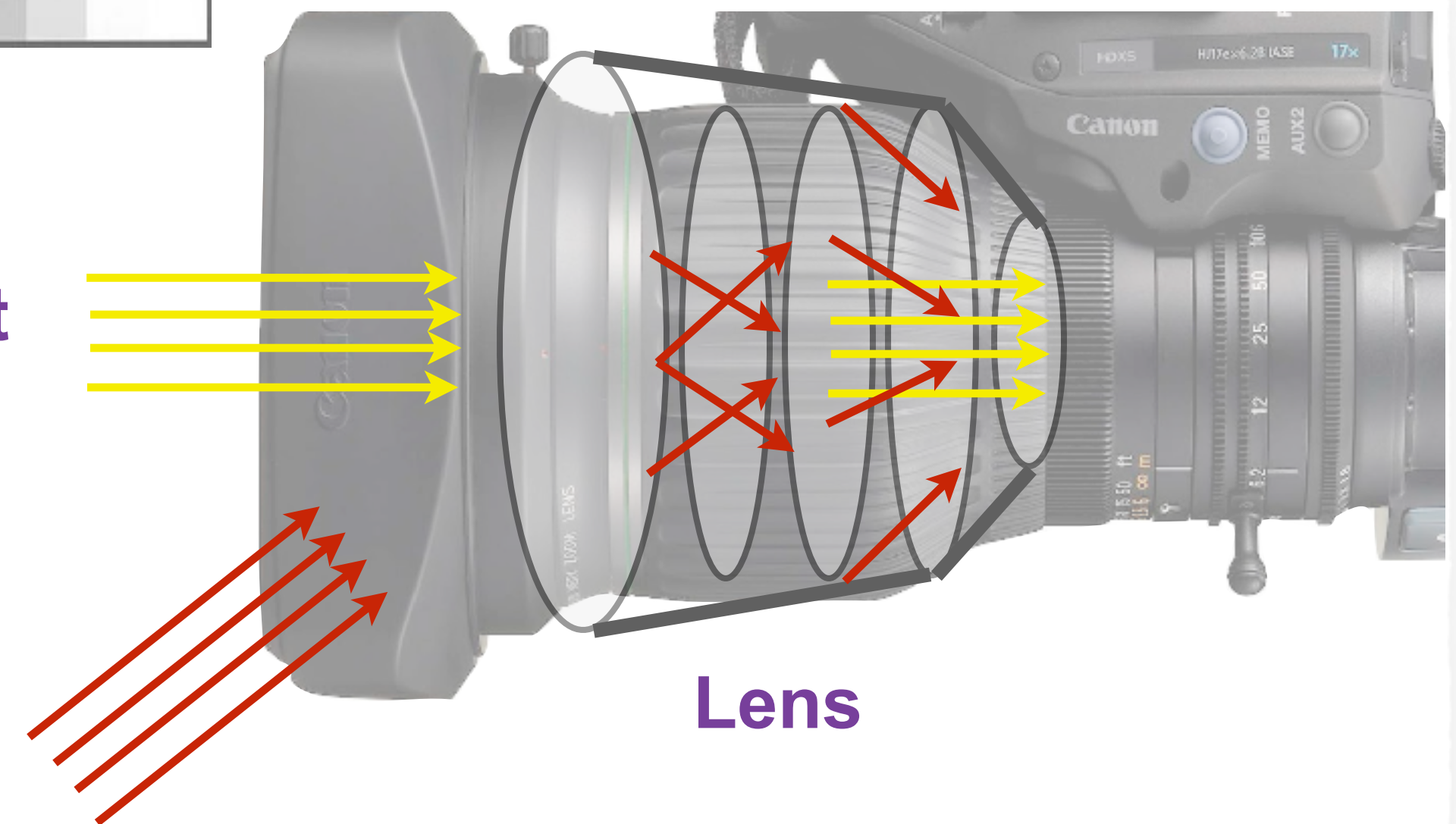


→ Direct Light

→ Reflected Light

Reflected Light could
change the blacks

Light



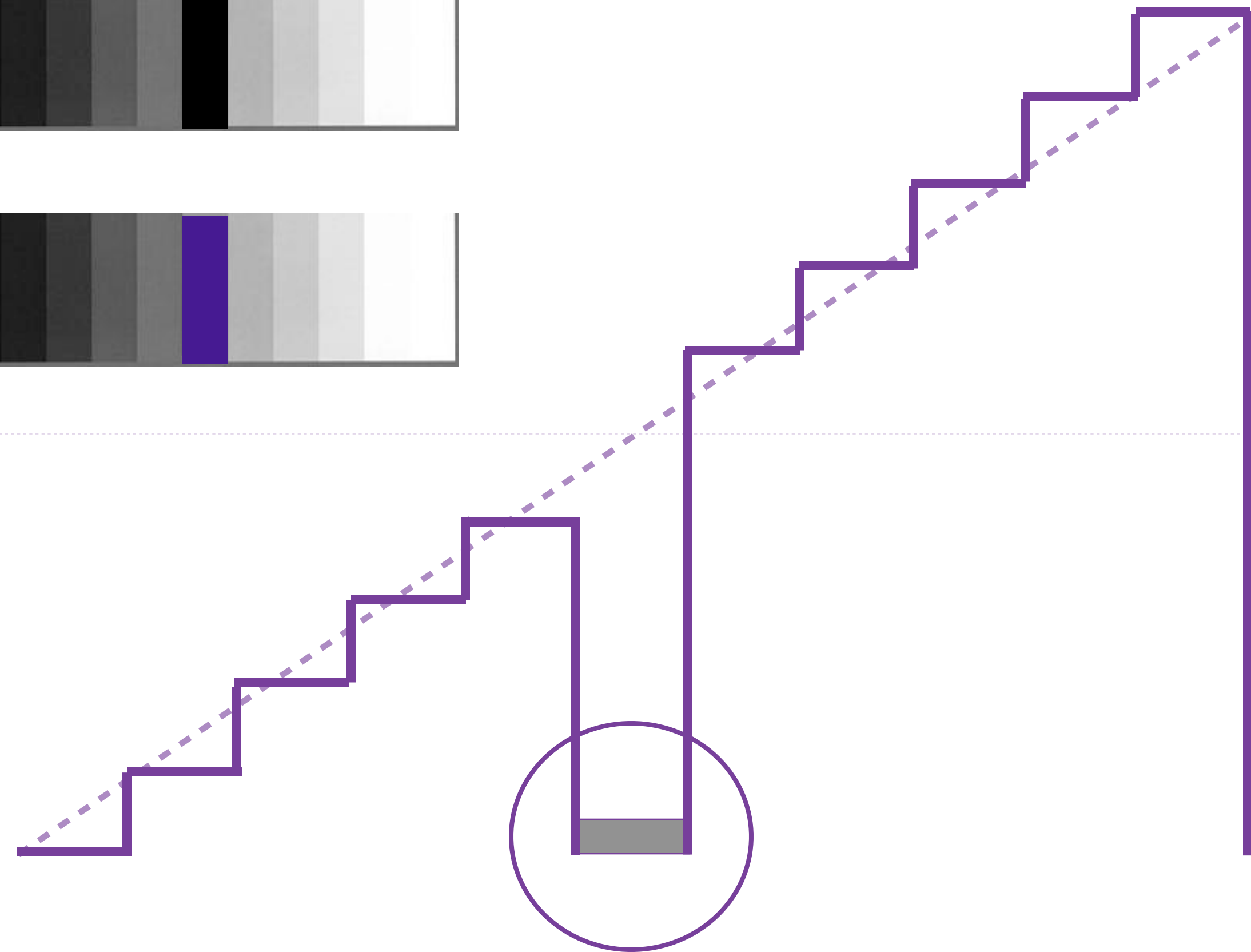
Sensor

Functional LDX series

Basics Video / Image processing

- *Gamma*
- *Knee*
- *Black Stretch*
- *Detail*
- *Color correction*
- **Flare**
- *White Shading*
- *Matrix*
- *RGB to Y/R-Y/B-Y*

Flare



Functional LDX series

- *Gamma*
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- *Black Stretch*
- *Detail*
- *Color correction*
- *Flare*
- **White Shading**
- *Matrix*
- *RGB to Y/R-Y/B-Y*

For LDK PAR on 00
SAW on 50

For LDX PAR on 50
SAW on 50

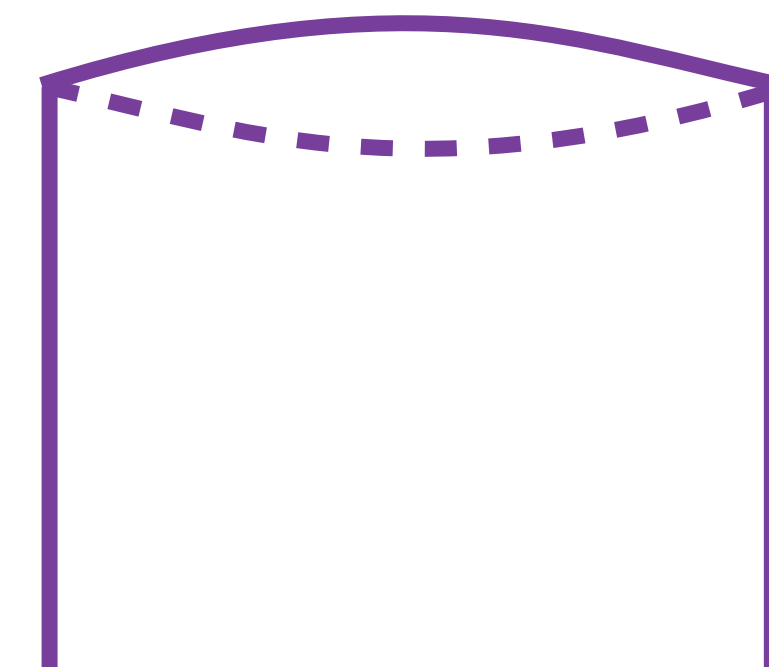
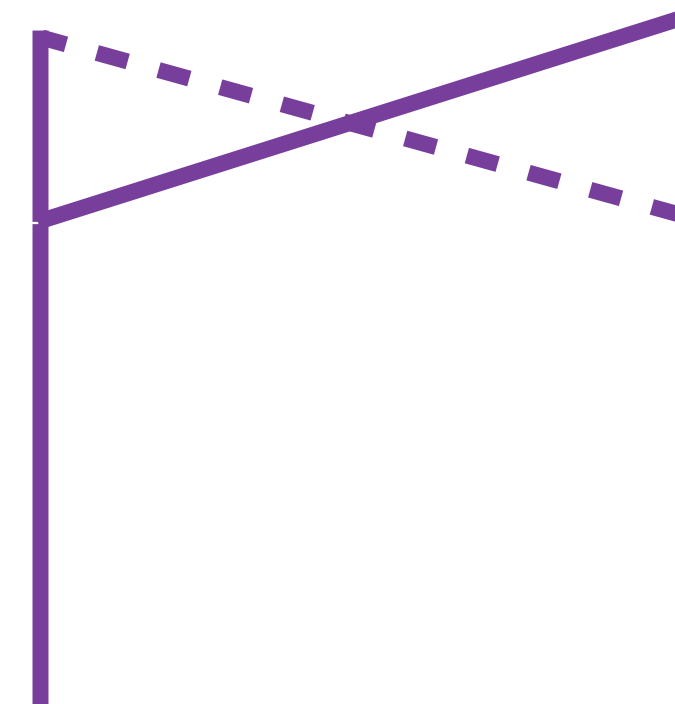
=> Basic settings

White Shading

Errors in Lens could disturb the white linearity

SAW tooth
correction

PAR able
correction

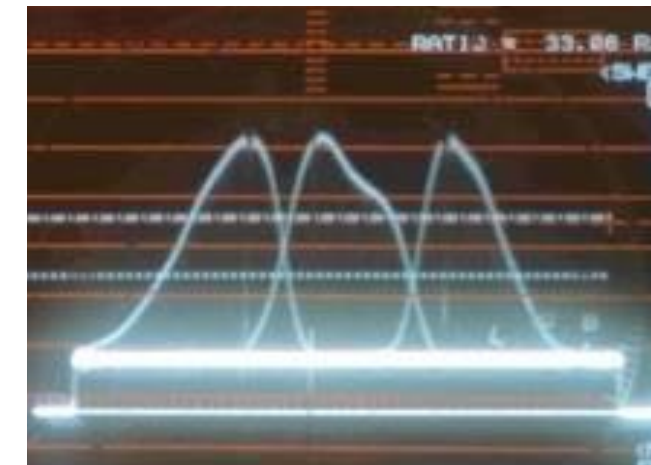


Functional LDX series

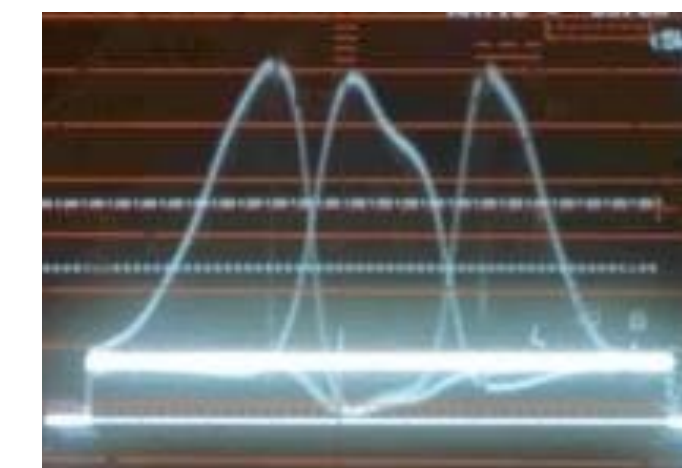
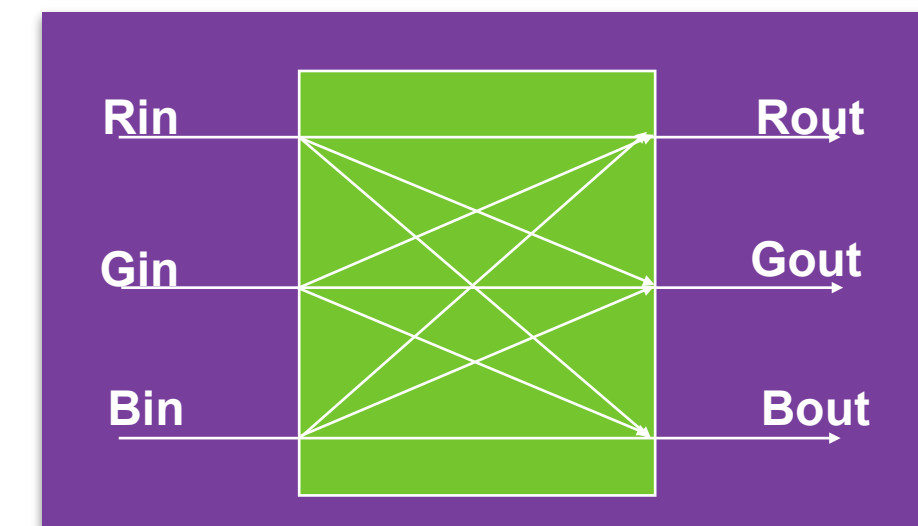
- *Gamma*
- *Knee*
- *Black Stretch*
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- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

Matrix



Correct the optical color splitter (prism)
Obtain specific color reproduction
(standardization, artistic)

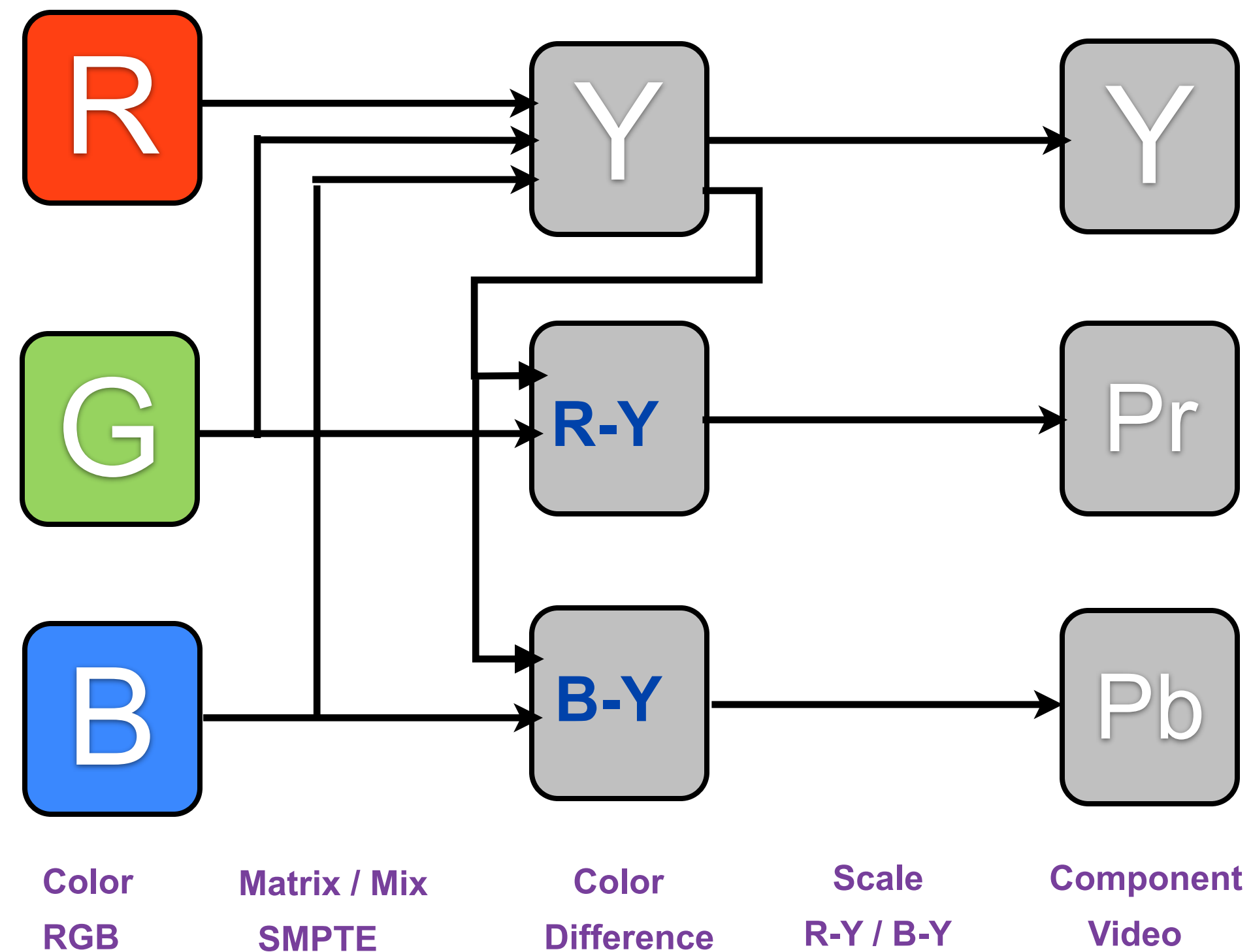


Functional LDX series

- *Gamma*
- *Knee*
- *Black Stretch*
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- *Color correction*
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- **RGB to Y/R-Y/B-Y**

Basics Video / Image processing

RGB to Y / R-Y / B-Y



Functional LDX series

LDX \Leftrightarrow LDK
difference in settings

Matrix:

- LDK 8000
 - Skin
 - G/M
- LDX
 - XGL
 - M/G

M/G is Sequence Matrix / Gamma

Gamma:

- LDK 8000
 - ARD
- LDX
 - ITU 709 (CCIR)

LDX \Leftrightarrow LDK



LDX Advanced

Part 1:

- ☑ Introduction & Basic information
- ☑ Menu structures
- ☑ LDX Basic functions

