

LDX Introduction session

2016/17

 FUTURE-READY

Your Host for today
Jan Paul Campman



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)

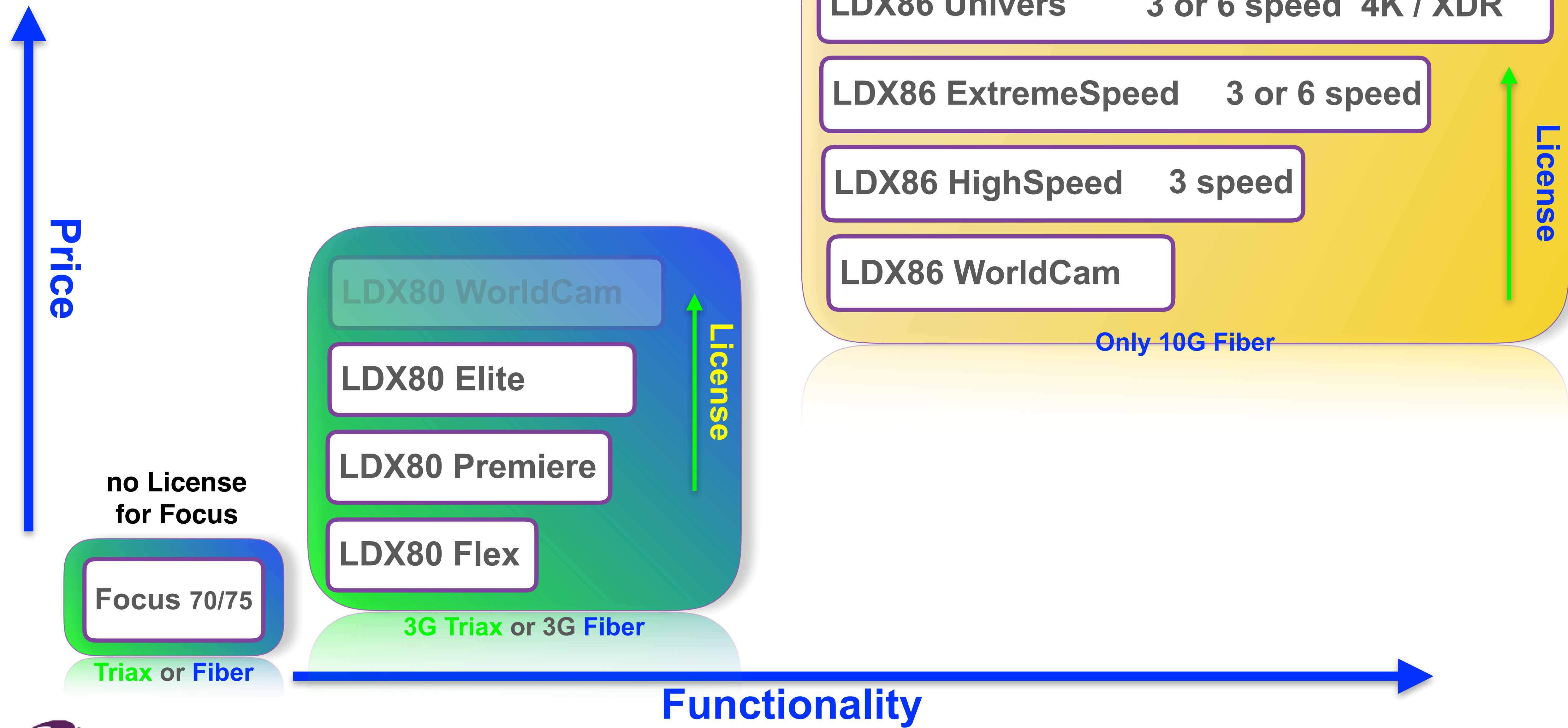
- **Xensium FT imager**
 - New video functions
 - Lens corrections
 - New leaking pixel corrector “TrueTexture”.
 - Improved LED-wall artifact compensation.
 - New menu structure with rotary knob
 - Changed button layout
 - More user friendly interface.
 - “Art Touch”.
 - Diagnostics
 - New mounting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



Introduction LDX series



Licenses LDX series 2016



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 <small>Only with License</small>	XDR
LDX82 Elite	XDR
LDX82 Premiere	XDR
LDX82 Flex	XDR

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

License

LDX86 Universe	3/6 speed 4K	XDR
LDX86 XtremeSpeed	3/6 speed	XDR
LDX86 HighSpeed	3 speed	XDR
LDX86 WorldCam		XDR

3G Triax
No HighSpeed

3G Fiber
No HighSpeed

Only 10G Fiber

Direct

License

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 series



LDX 86 now available in 2 flavours

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 development)
- 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



LDX 86^N Series – High-level overview



✦ Introduced at NAB / IBC 2016 – First Commercial Shipment July '16



✦ New Xensium^{HAWK} imager with DPM^{Ultra}
Based on Xensium^{FT} with 2.5μ image cell



✦ Improved optical alignment accuracy
Making an important step forward in a key process



✦ Additional 5μ optical low-pass filter
Delivering sublime HD when in HD modes



✦ Improved soft-focus filter
Matching the HD/4K characteristics and requirements



Strength comparison - Native 4K versus Processed 4K

■ Use the technology which fit best to the specific requirements

■ For **wide angle** shooting position

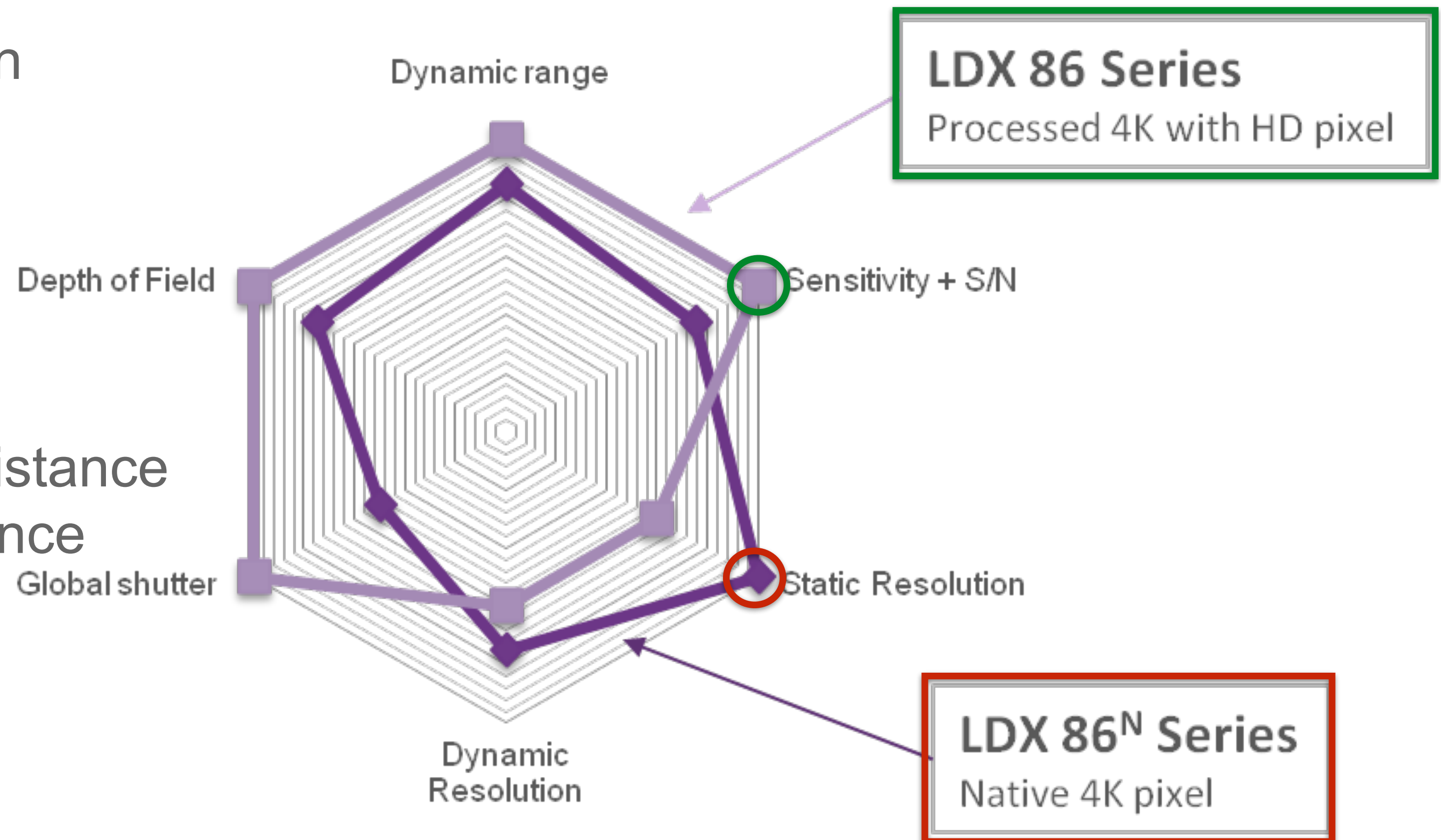
Resolution is most important

- 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 Video modes overview

Available

1080i or 720p

Not available

Under development



Triax		Entry level		Mid Range				High End					
Fiber 3G		Focus 70 / 75		LDX 82 series				LDX 86(n) series (with Universe XCU)					LDX 86n
Fiber 10G	Adaptor type >												
Available as	Compact >>							C86/86n	C86/86n	C86/86n	C86n	C86n	
Format	Modes Type	70 (APAC)	75(rest)	Flex	Première	Elite	WorldCam only with Lic	WorldCam	HiSpeed	Xtreme Speed	Univers	4K native	
HD 50/59Hz	720p	or		or									
	1080i	or		or									
	1080PsF												
	1080p												
HighSpeed 50/59Hz	3 x 1,5G												
	3 x 3G												
	6 x 1,5G												
4K 50/59Hz	4K (CONV)												
	4K native												
License	XDR									Single Speed	Single Speed		

Grass Valley Cameras **Functions/Features** overview

Available

Not available

Under development

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													u.d.
	XDR(Lic)	Gain / Detail													
	4K	4K Details													

Grass Valley Cameras System overview



Reflex *(Super expander)*



Power convertor
Available in several flavours
Triax to Fiber
Fiber to Triax



Fiber power box (HDX plus)



Adaptor

LDX




Available in several flavours

3G Triax		Focus Triax	
3G fiber		Focus Fiber	
10G Fiber			

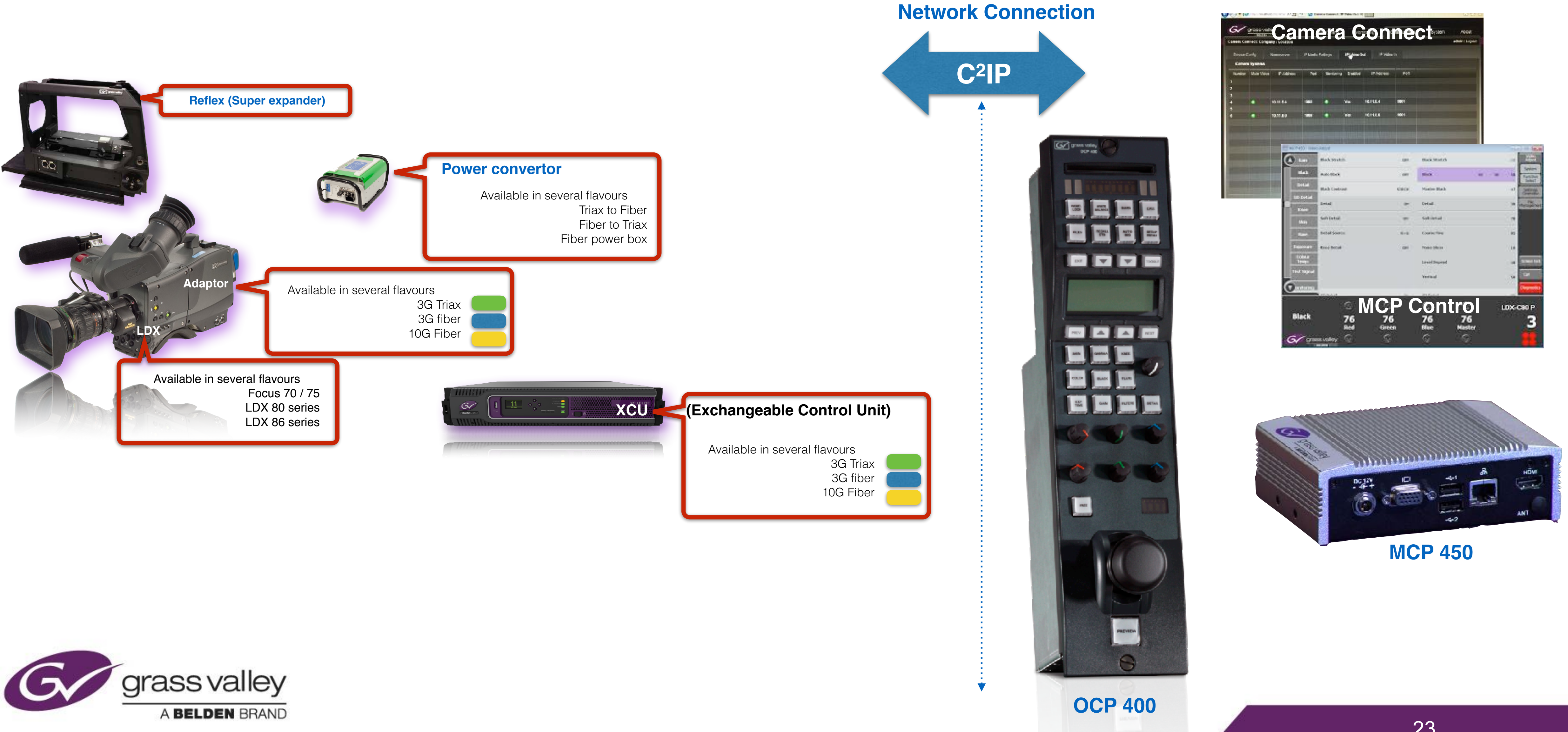
Available in several flavours
Focus 70 / 75
LDX 82 series
LDX 86 series



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

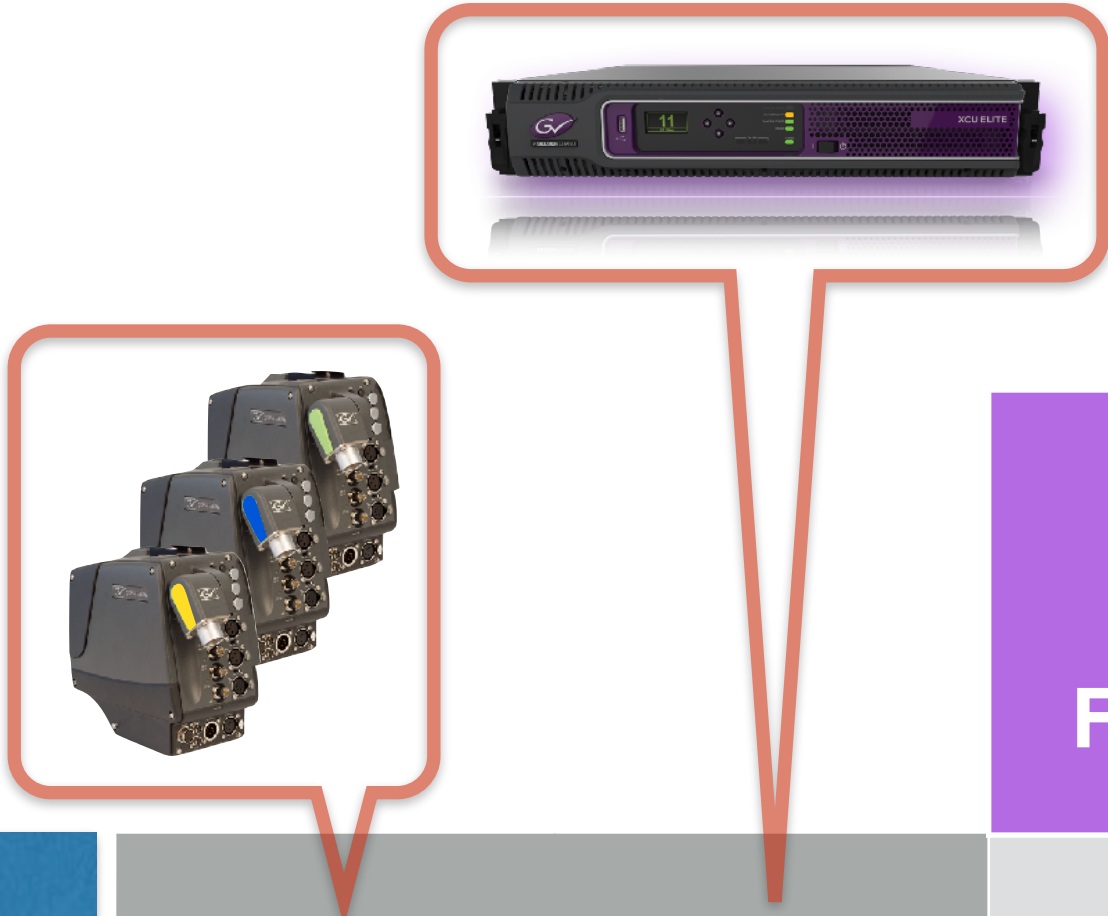
3G Triax	
3G fiber	
10G Fiber	

Grass Valley Cameras System overview



Grass Valley Cameras XCU /Adaptor overview

 Not applicable



License 

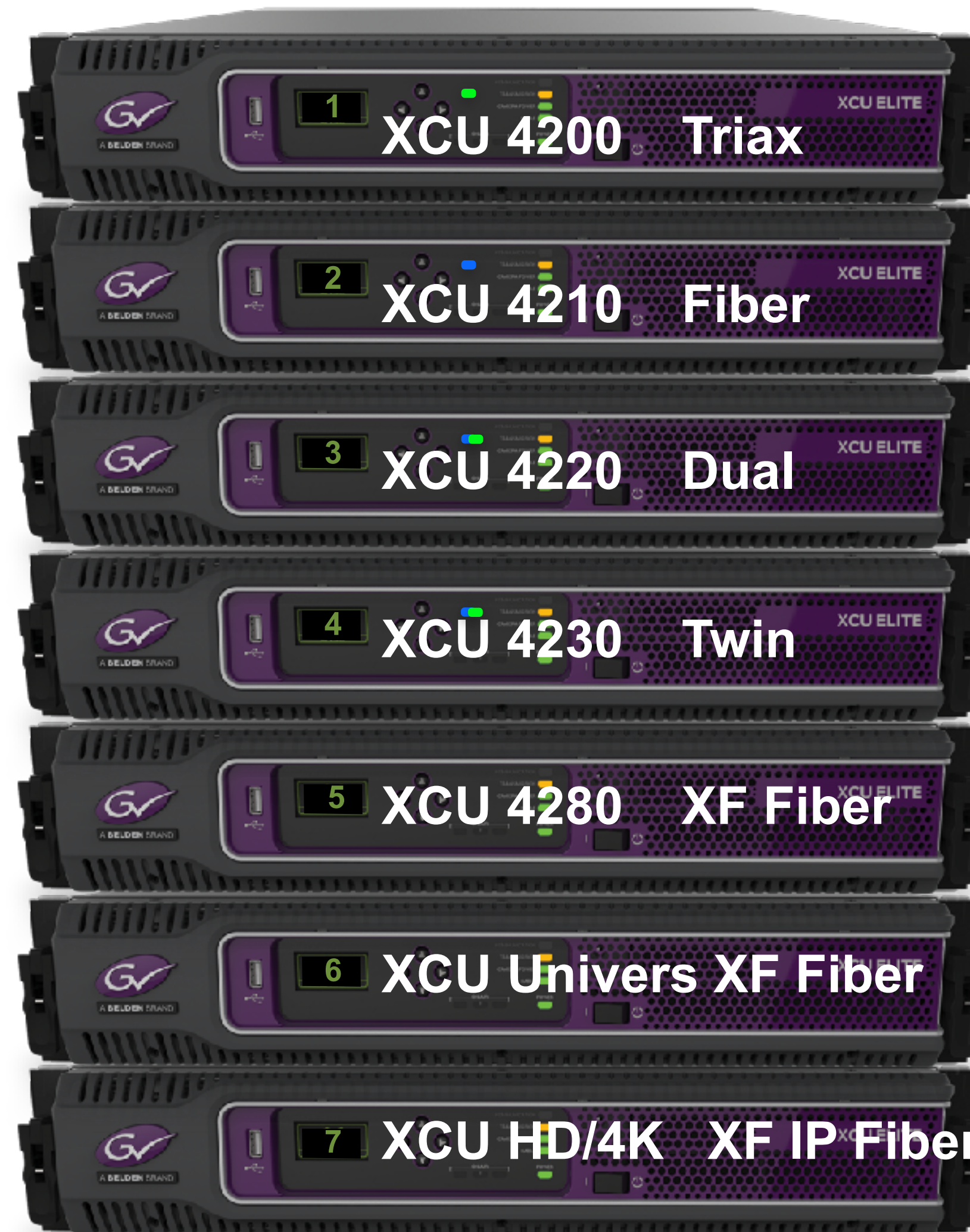
License 

		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 2017 NAB

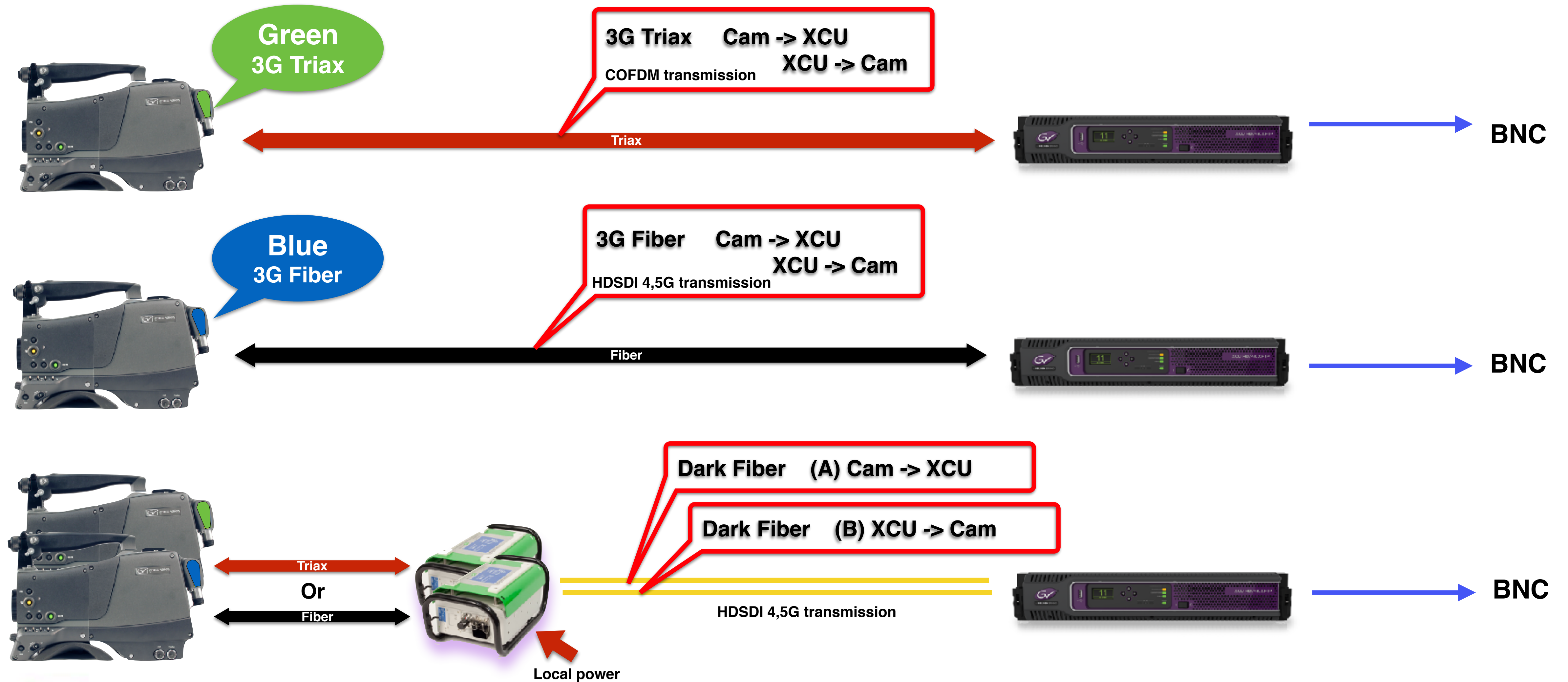


UXF XCU

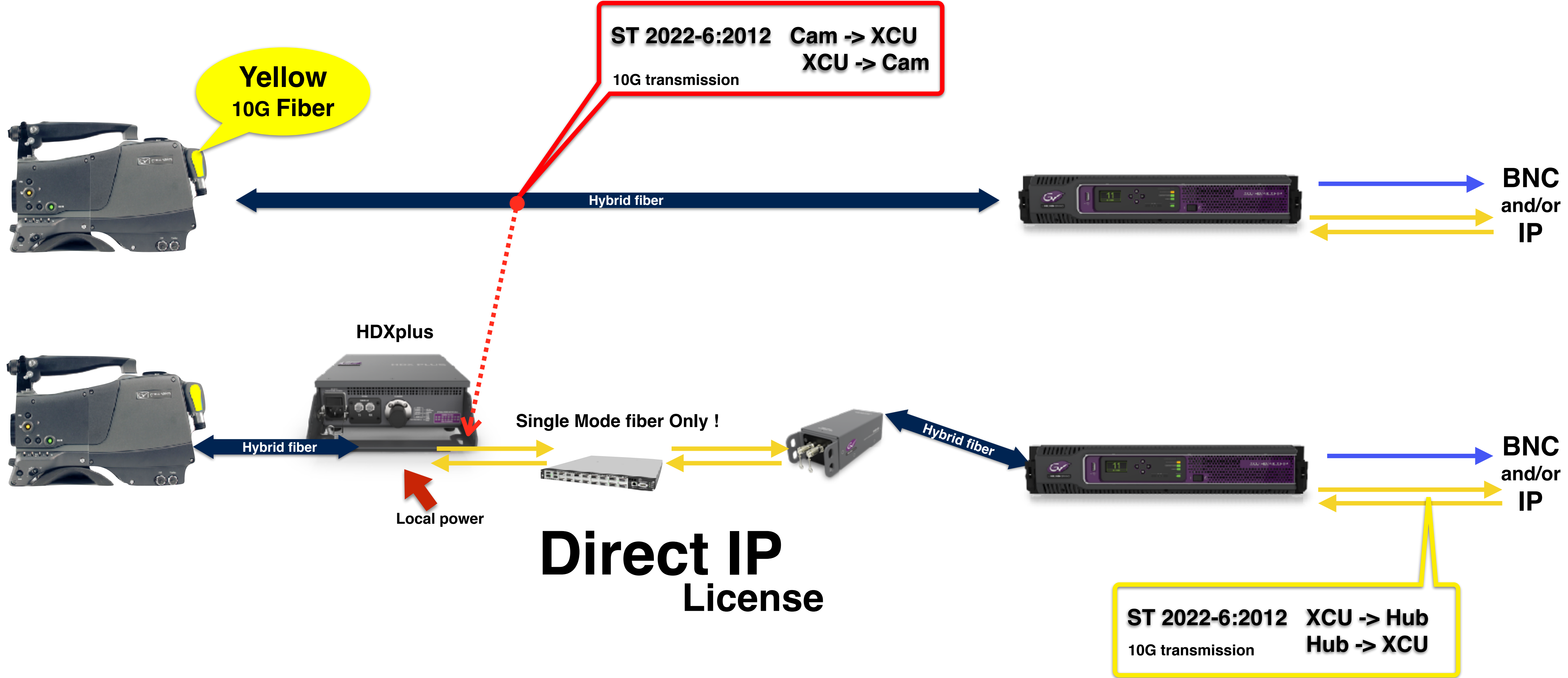


3G Triax Adaptor LDK 5640 
3G Fiber Adaptor LDK 5650 
10G Fiber Adaptor LDX 5680 

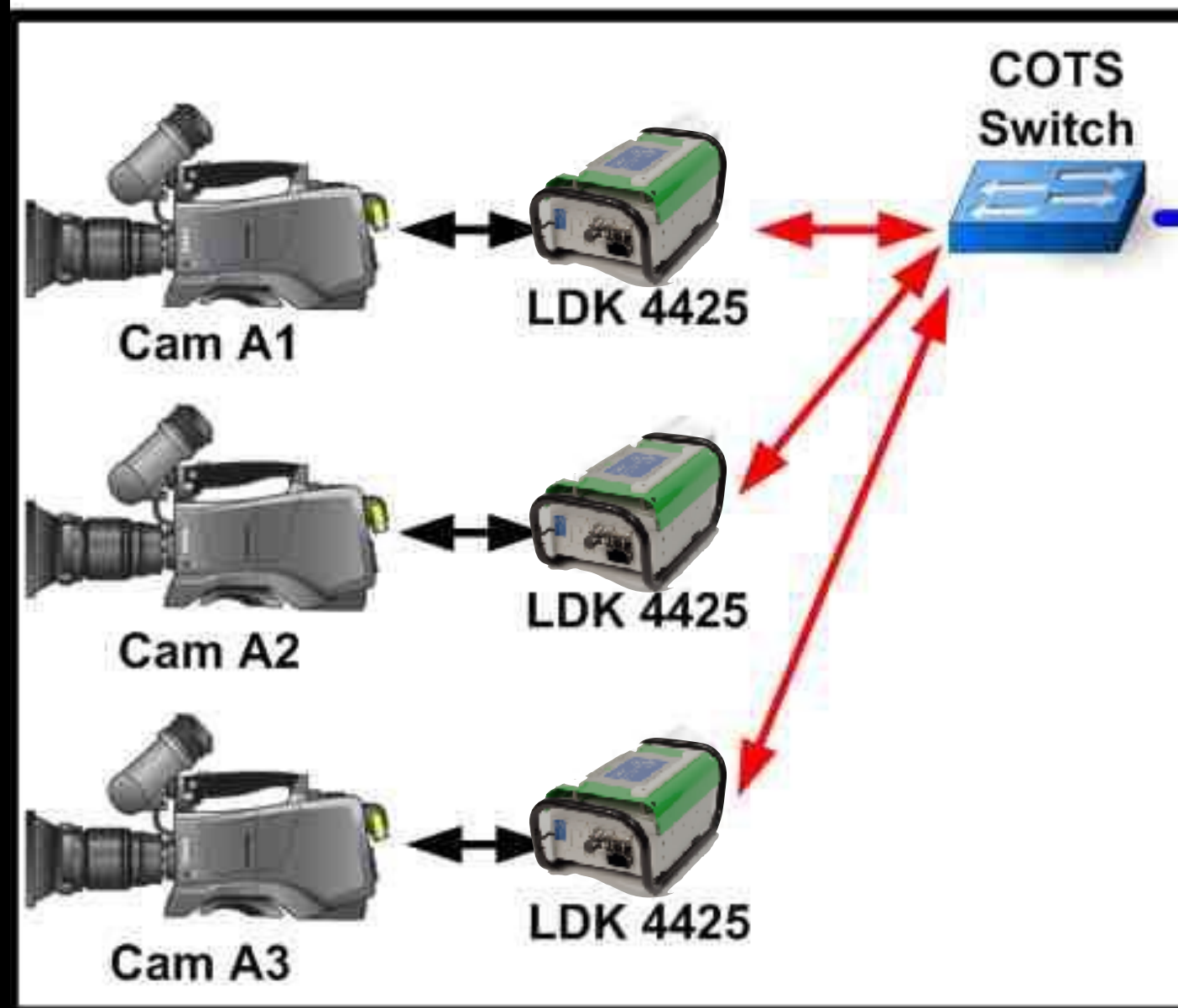
Available (3G Triax/Fiber) System connections



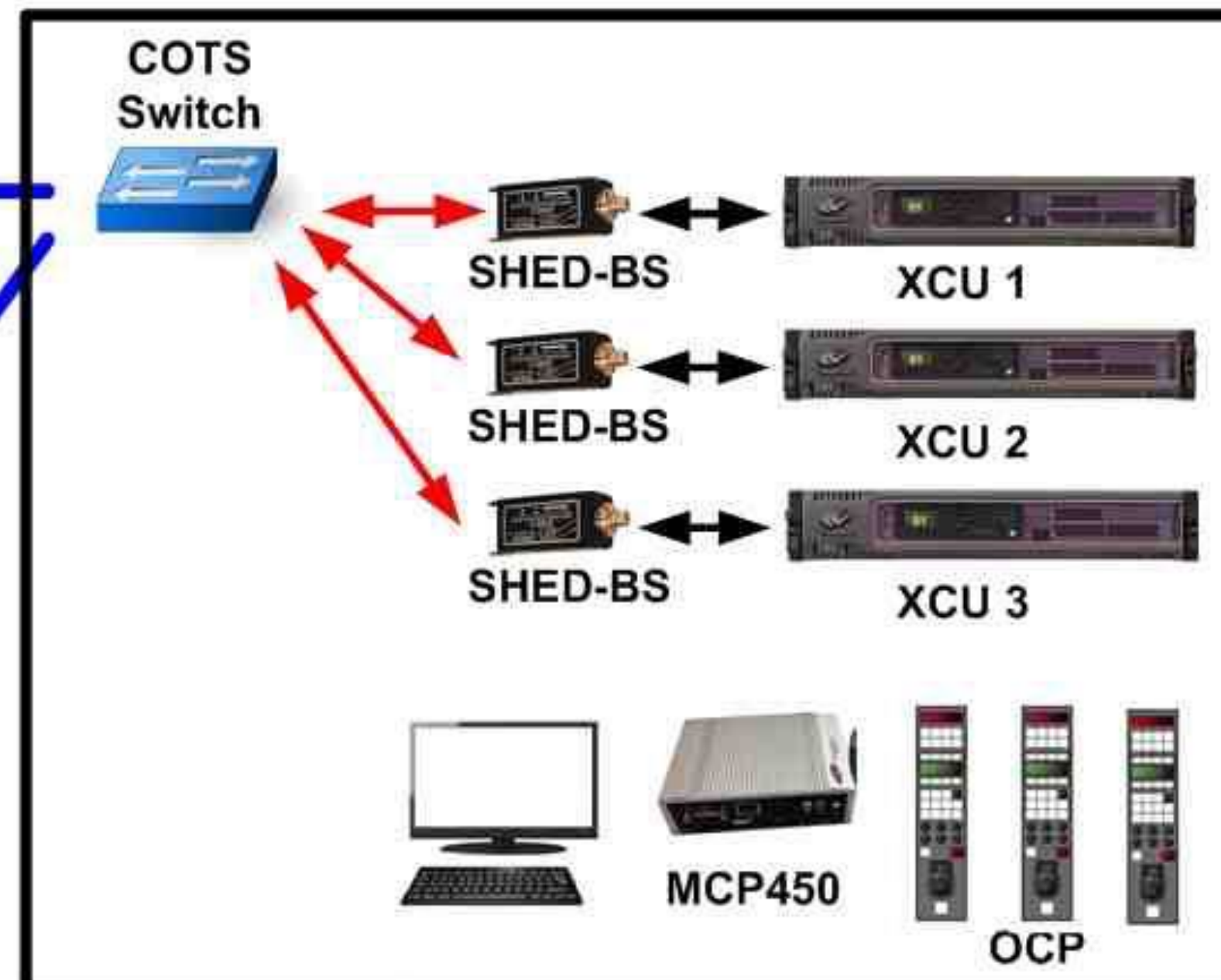
Available (10G IP based) System connections



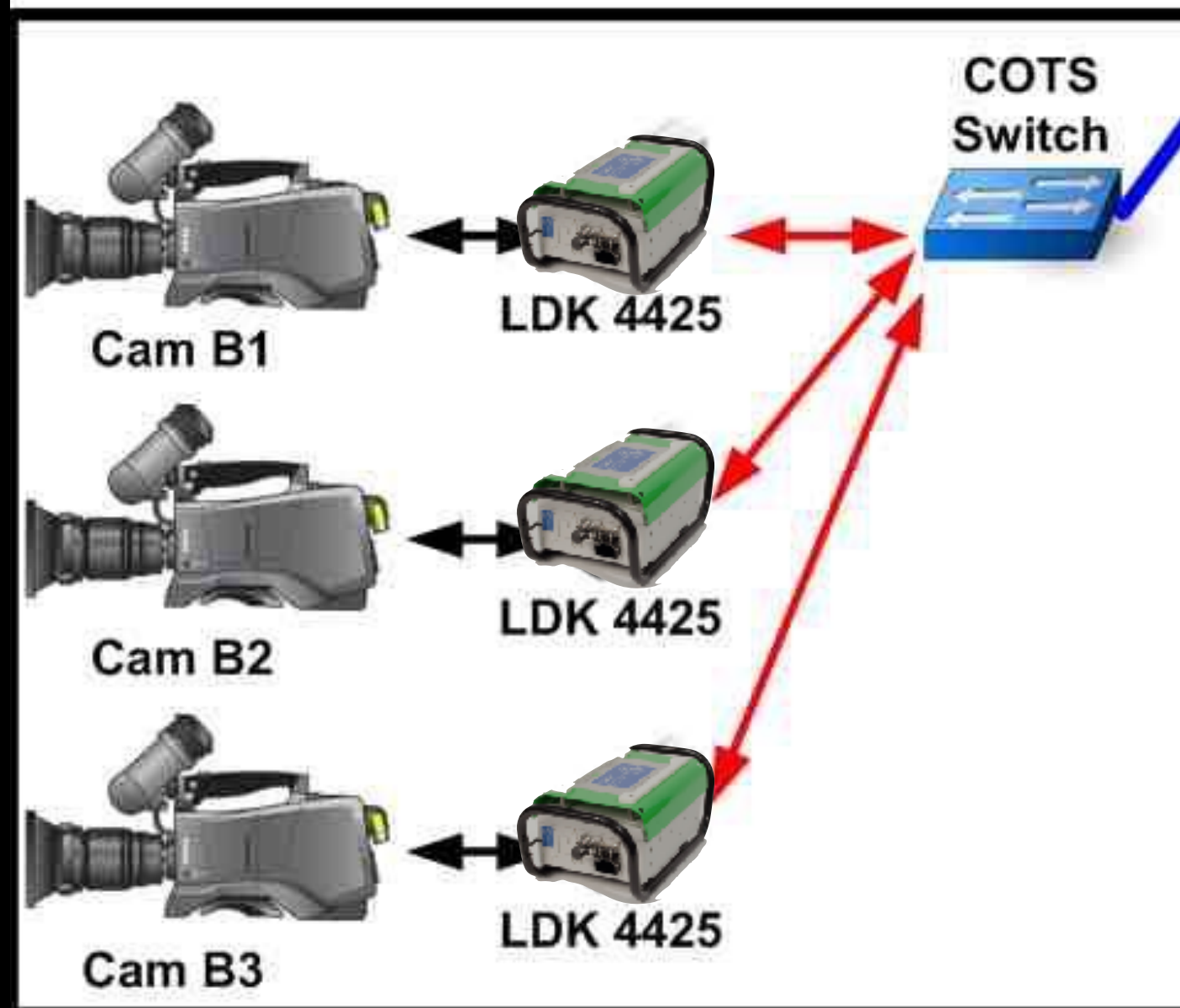
Studio A



Control Room






Studio B



IP Trunk
(same network)

IP Trunk
(same network)

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

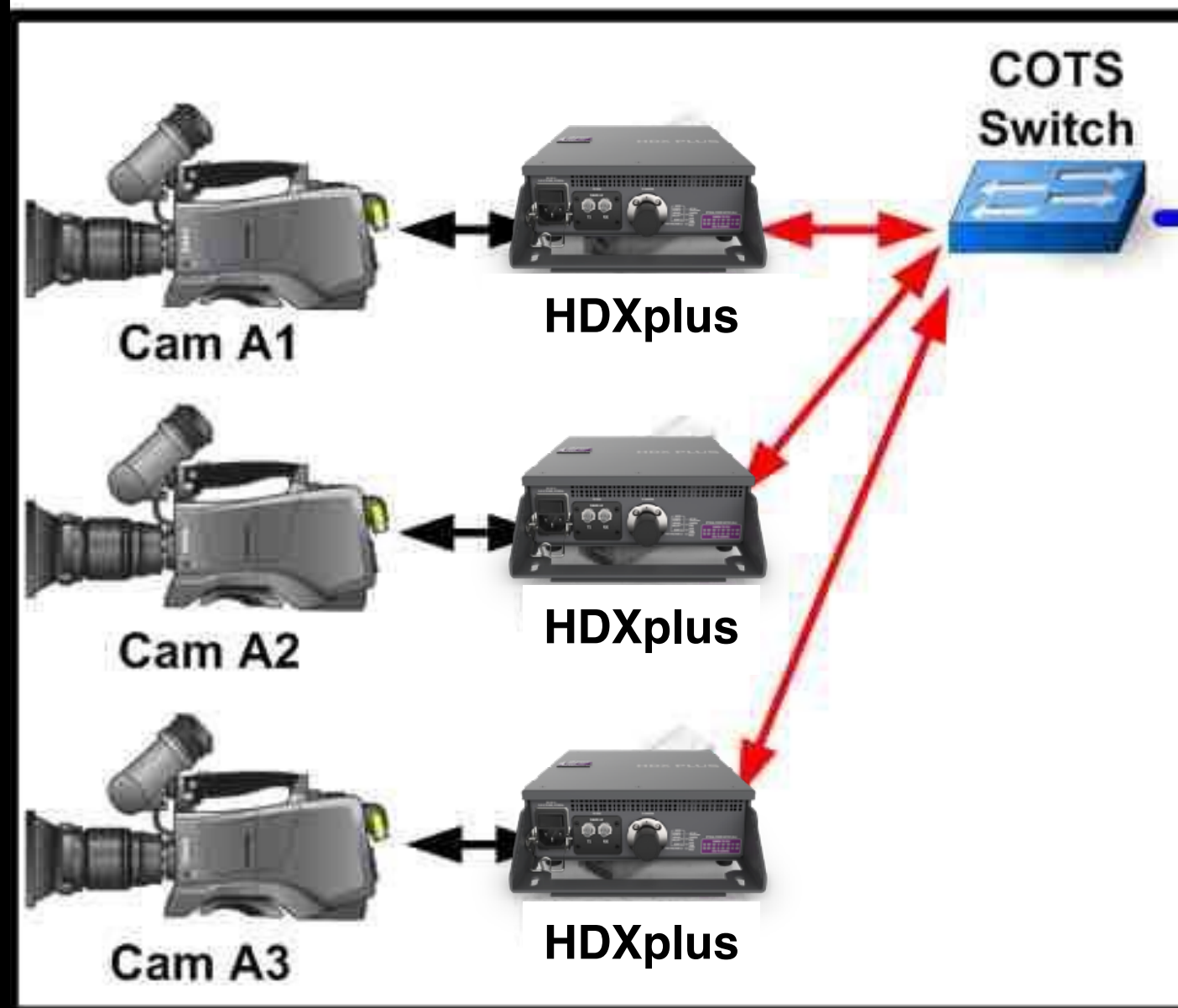
-  2x single mode fiber / 10Gb SFP+ module
-  Standard SMPTE hybrid fiber cable
-  IP Network trunk between 2 COTS switches

DIRECT IP
(licence needed)

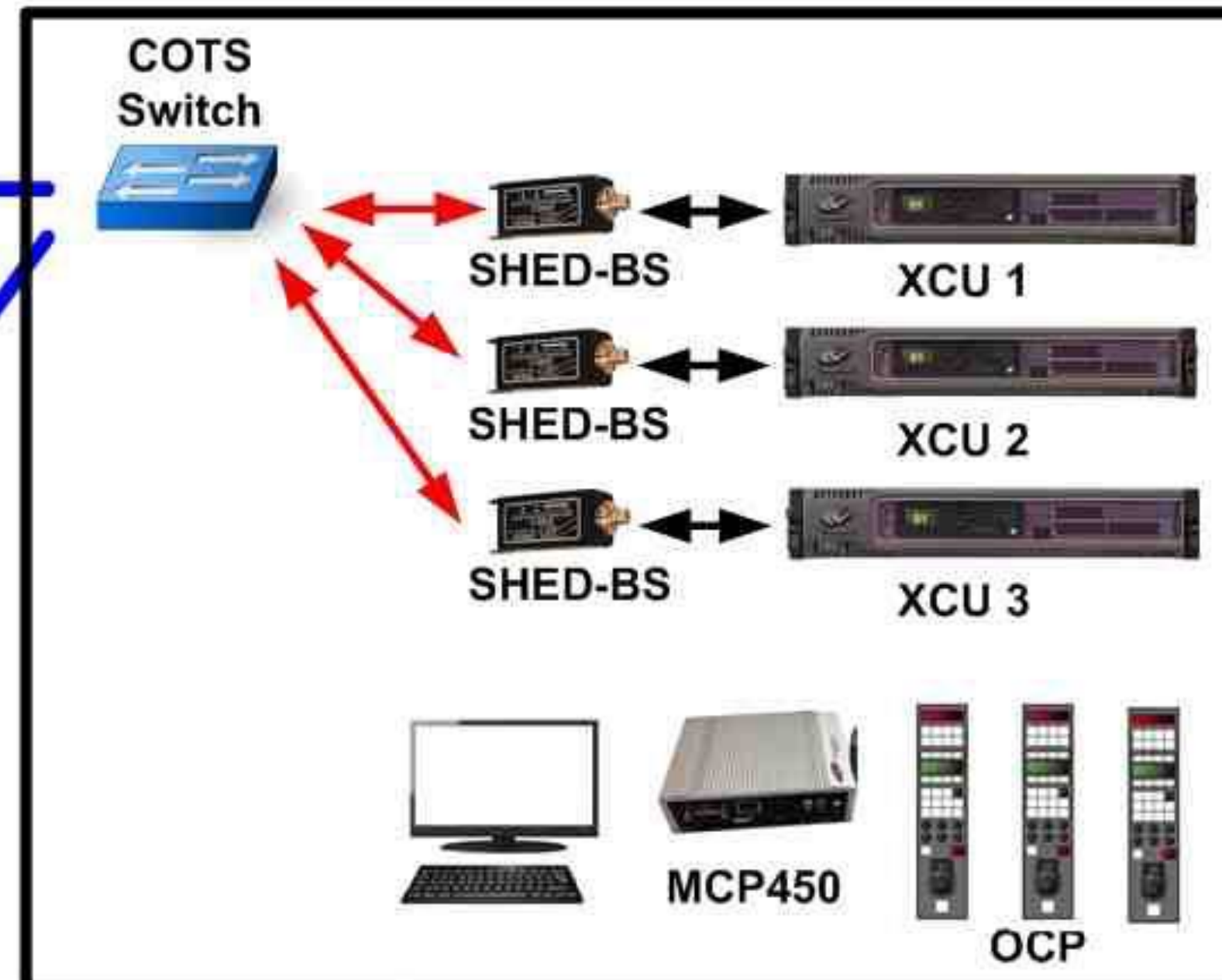
Example



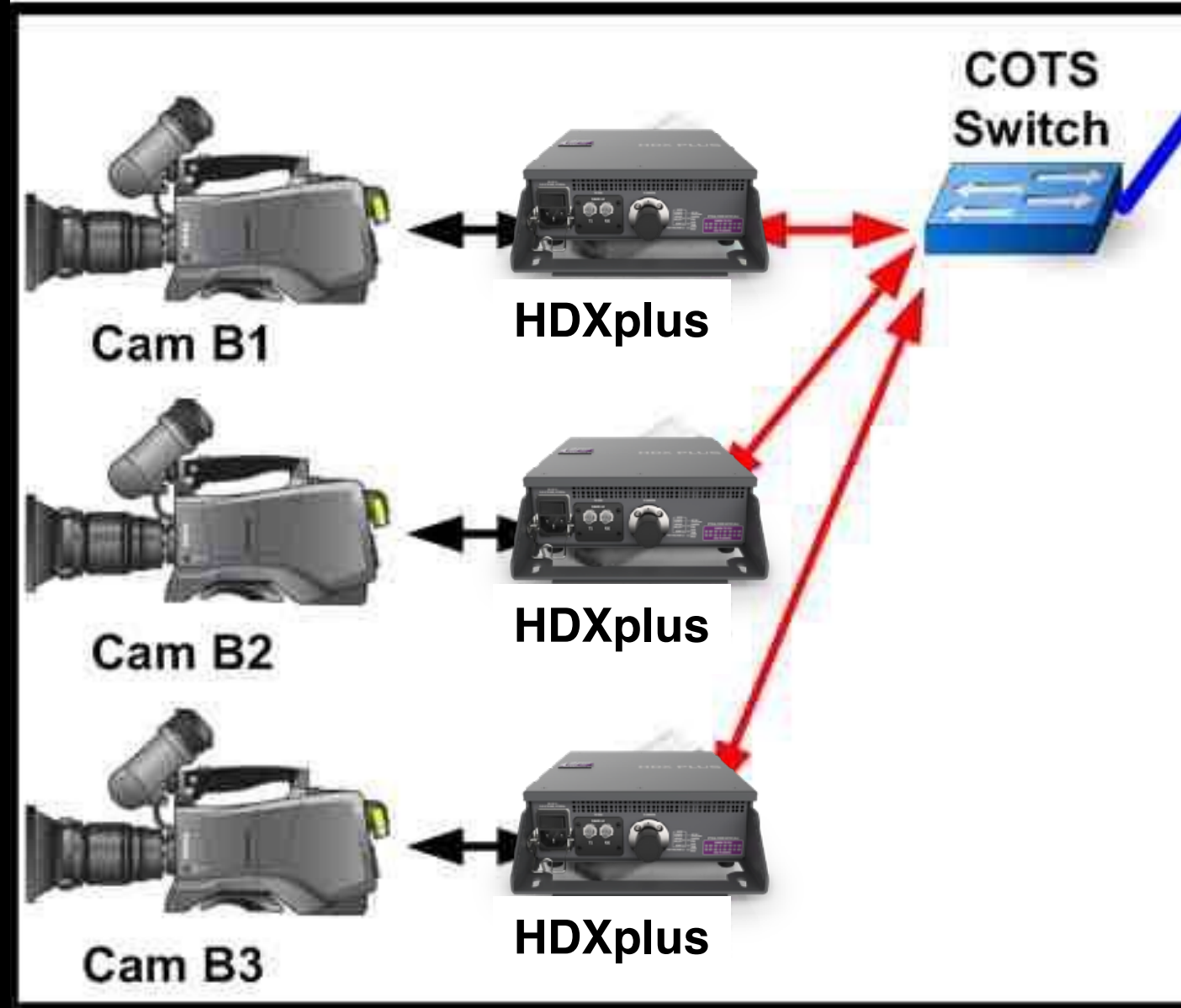
Studio A



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



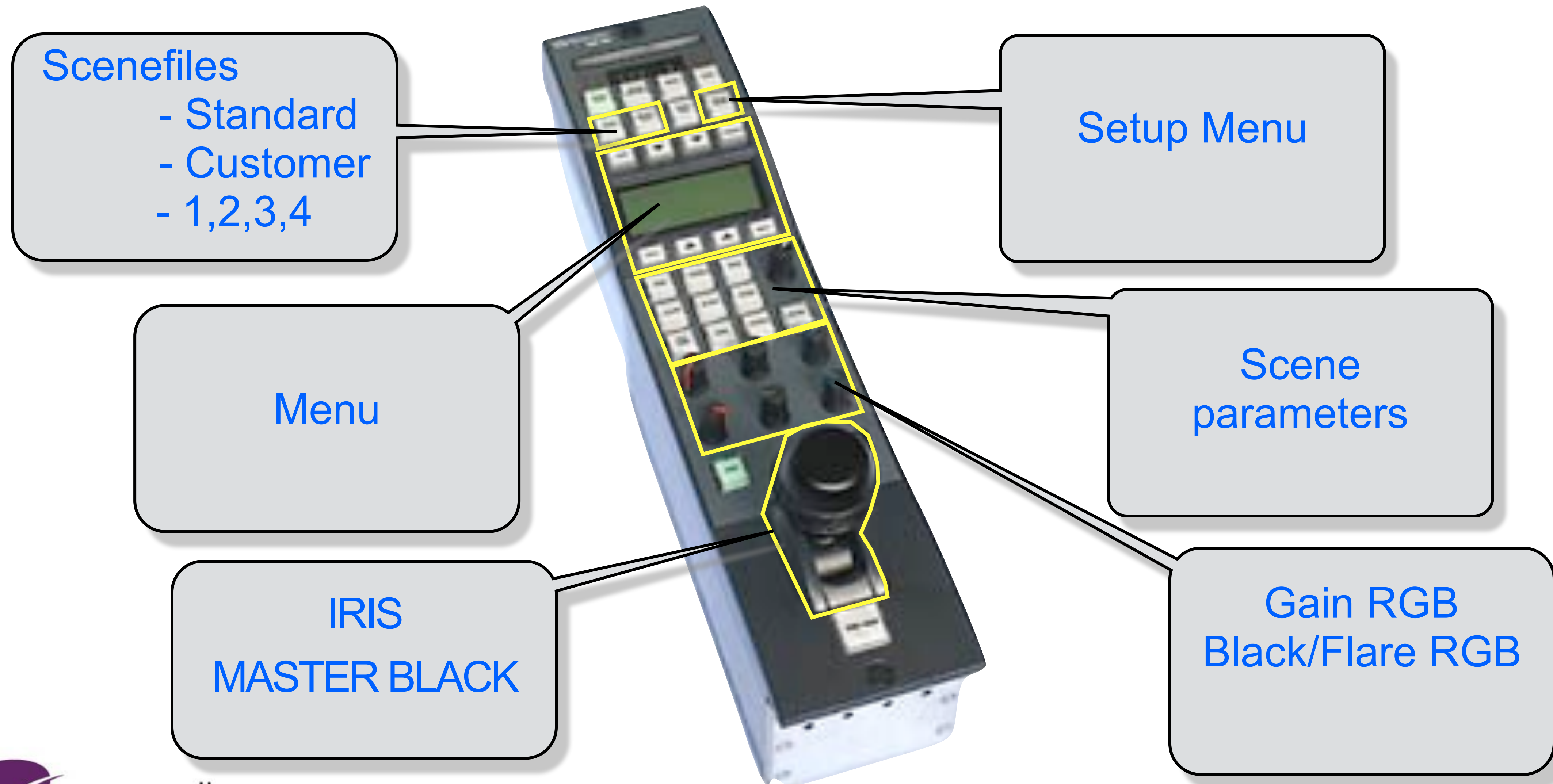
Generic Operational Controls





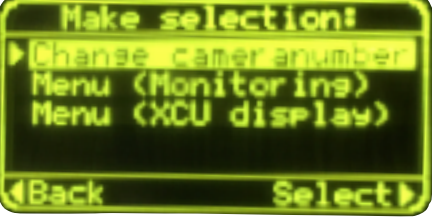










Touch



Generic Operational Controls



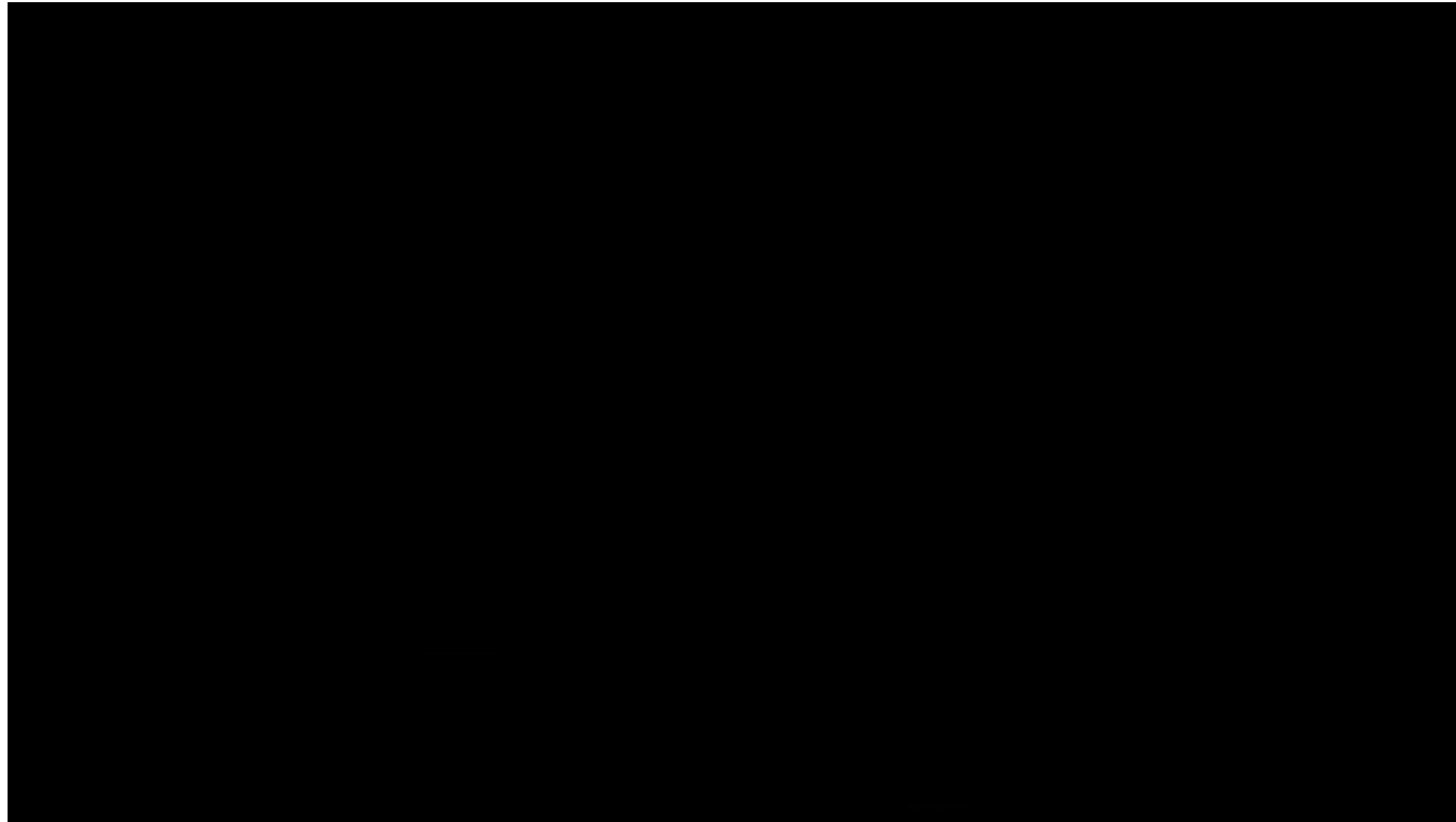
Generic Operational Controls

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

Generic Operational Controls

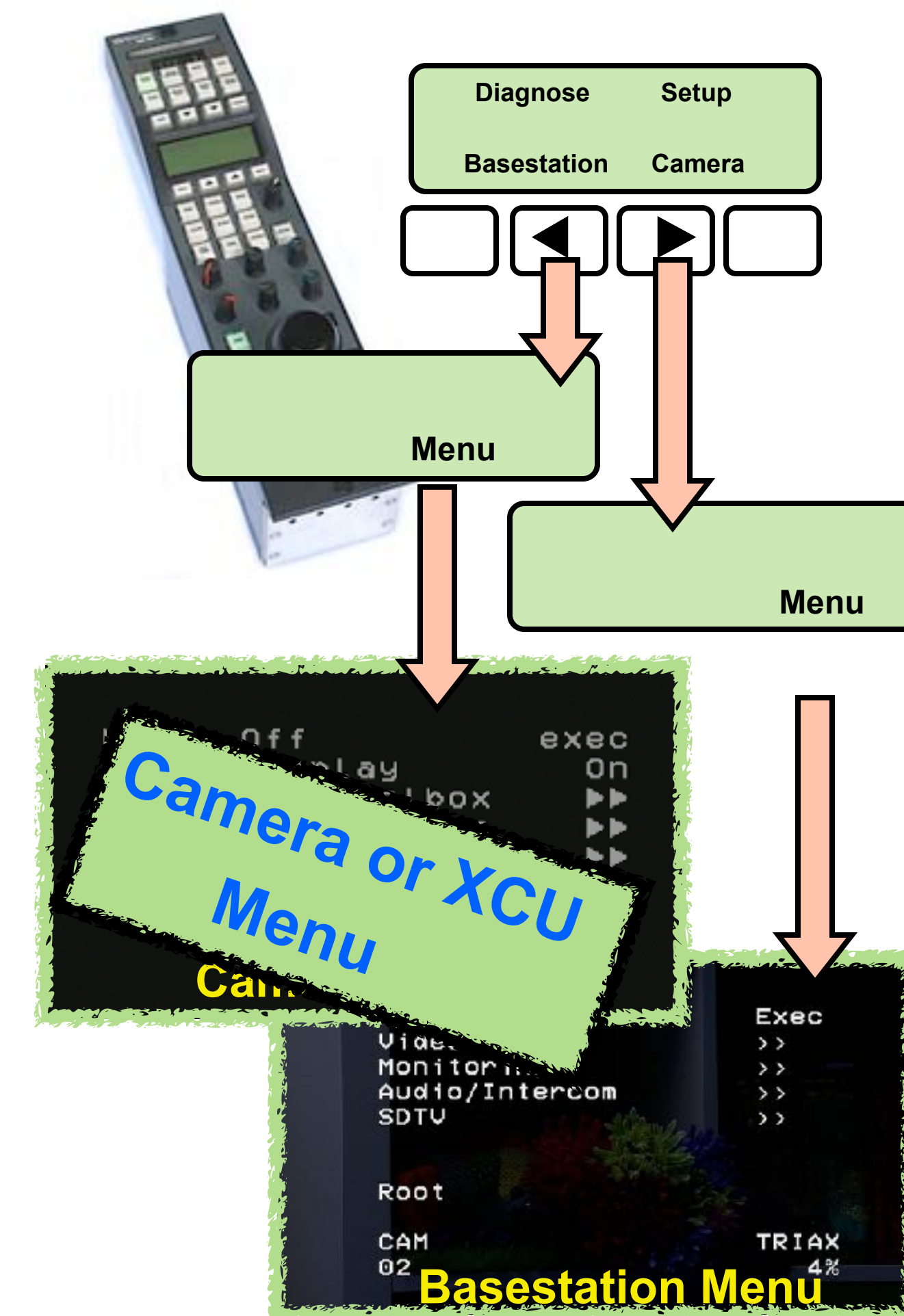
Camera or XCU

menu from OCP



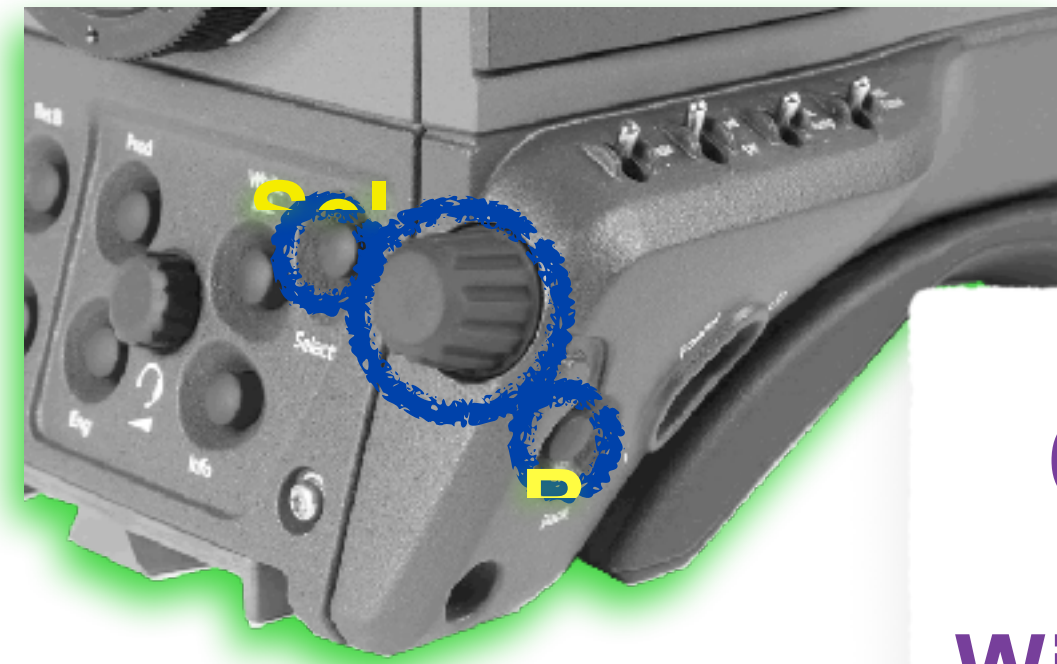


■ HD Text out (XCU)



■ HD Text out (XCU)

Generic Operational Controls



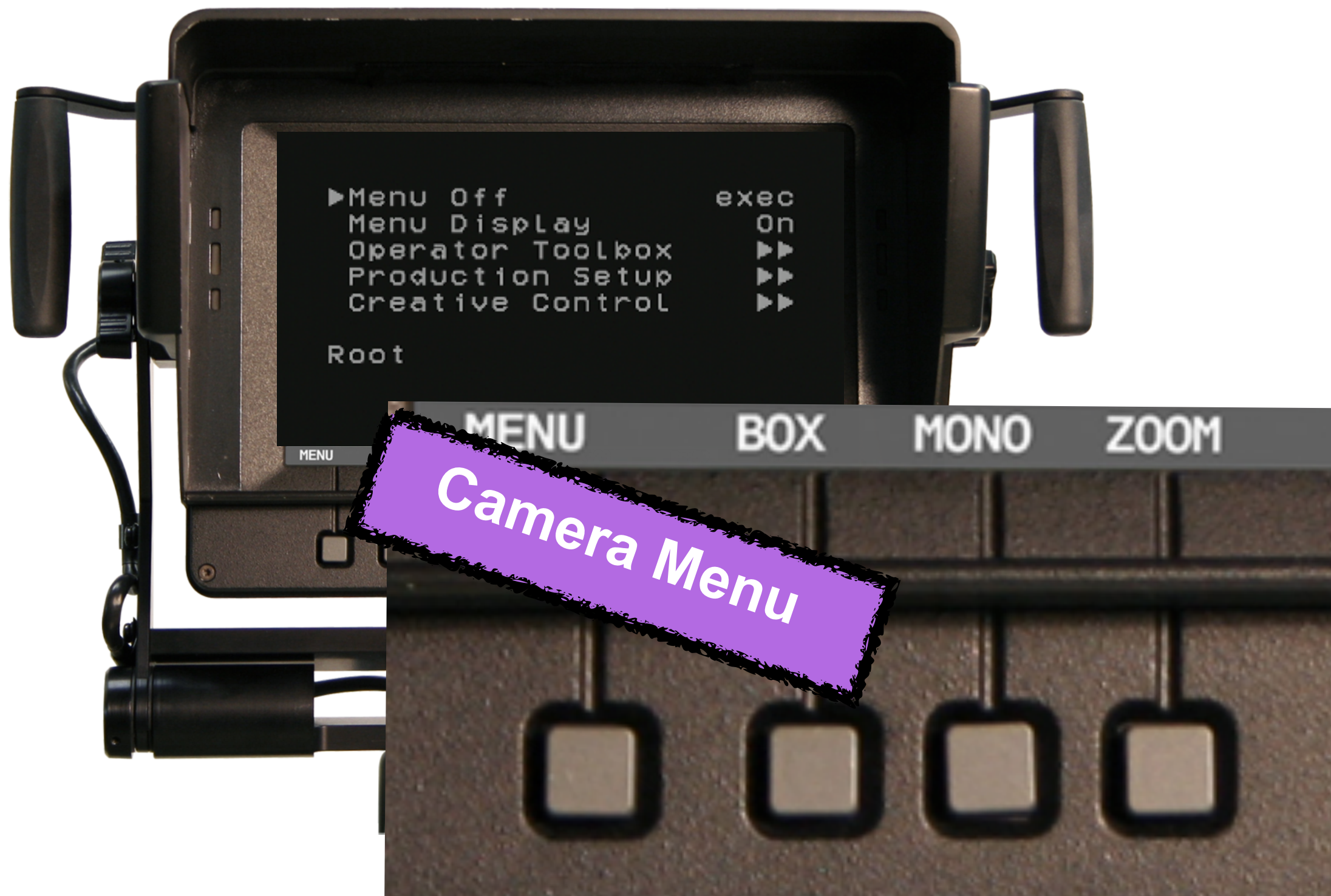
Camera menu

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



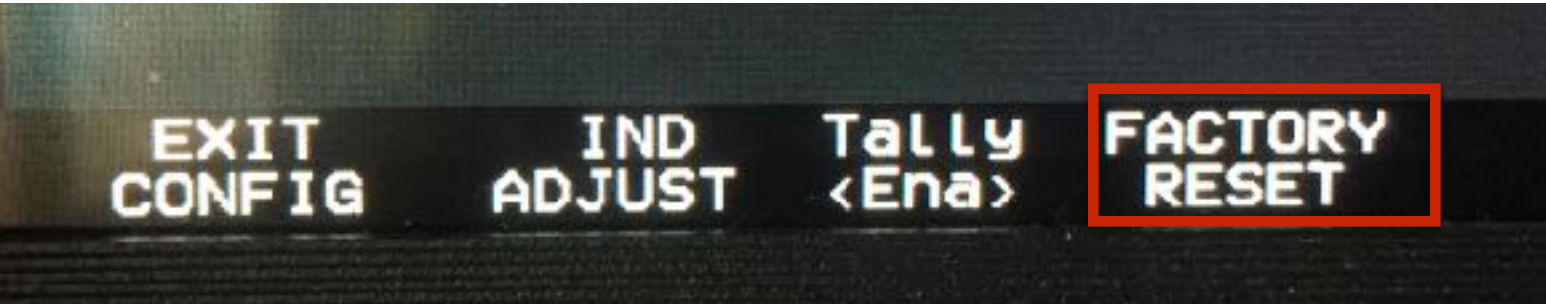
Viewfinder Menu



Generic Operational Controls



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



Camera Menu

EXIT DOWN UP SELECT



Viewfinder Menu



Diag
Config1
Config2
Zoom
Color
Mono
Box

EXIT DIAG STATUS INFO

Format 1080150 VF Temp 38 C

PREV NEXT

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
				
				

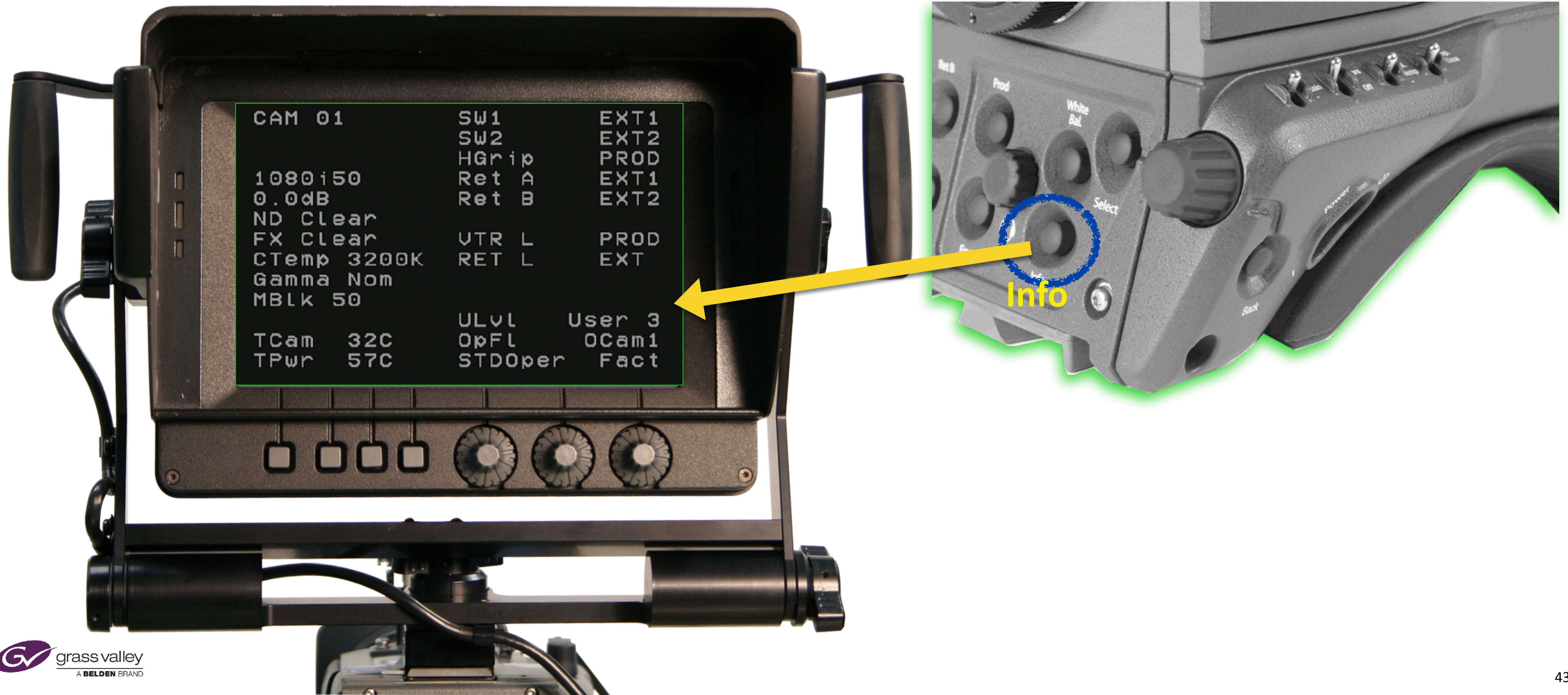
Menus

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

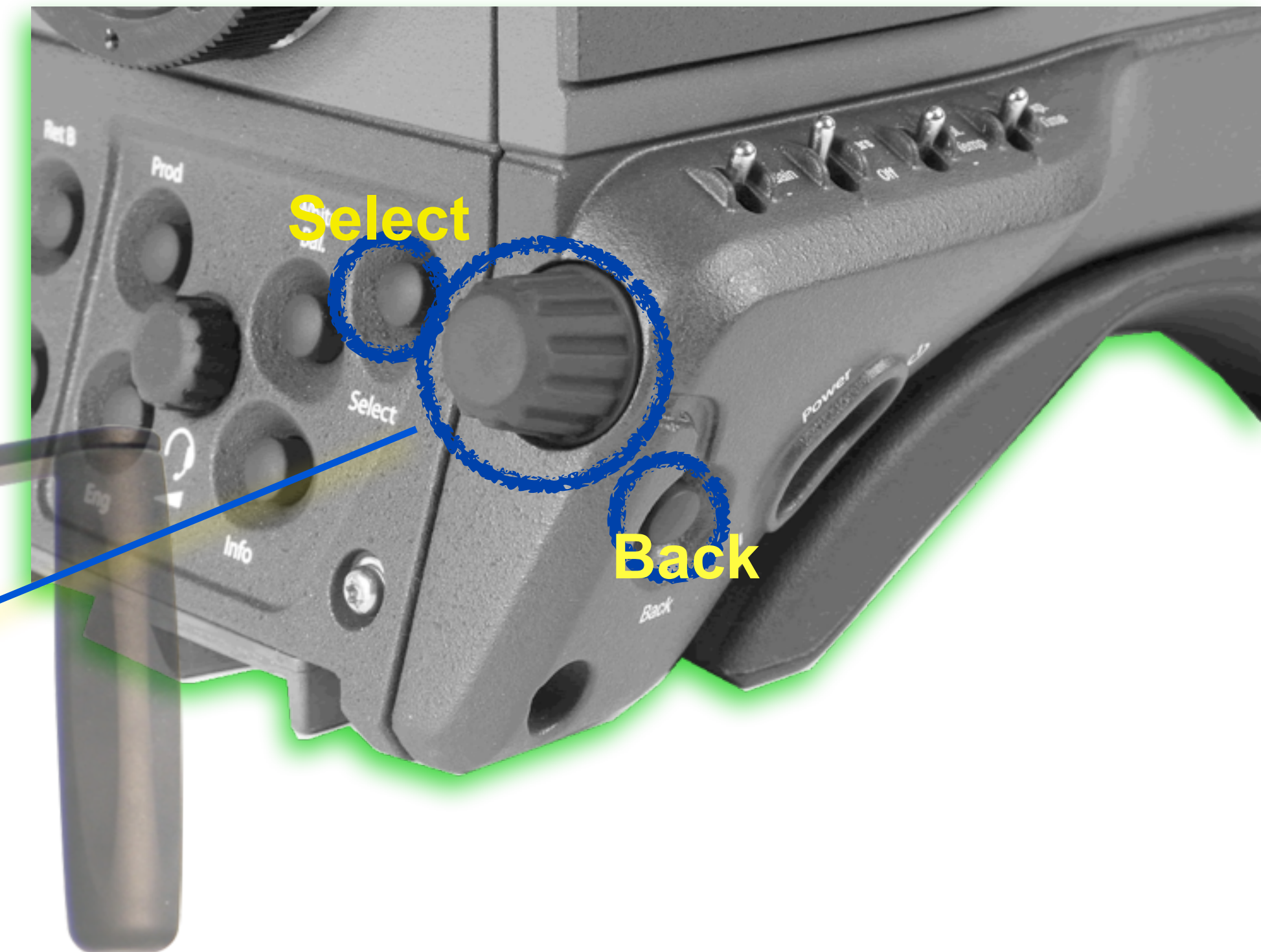
The ArtTouch Menu

- 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.

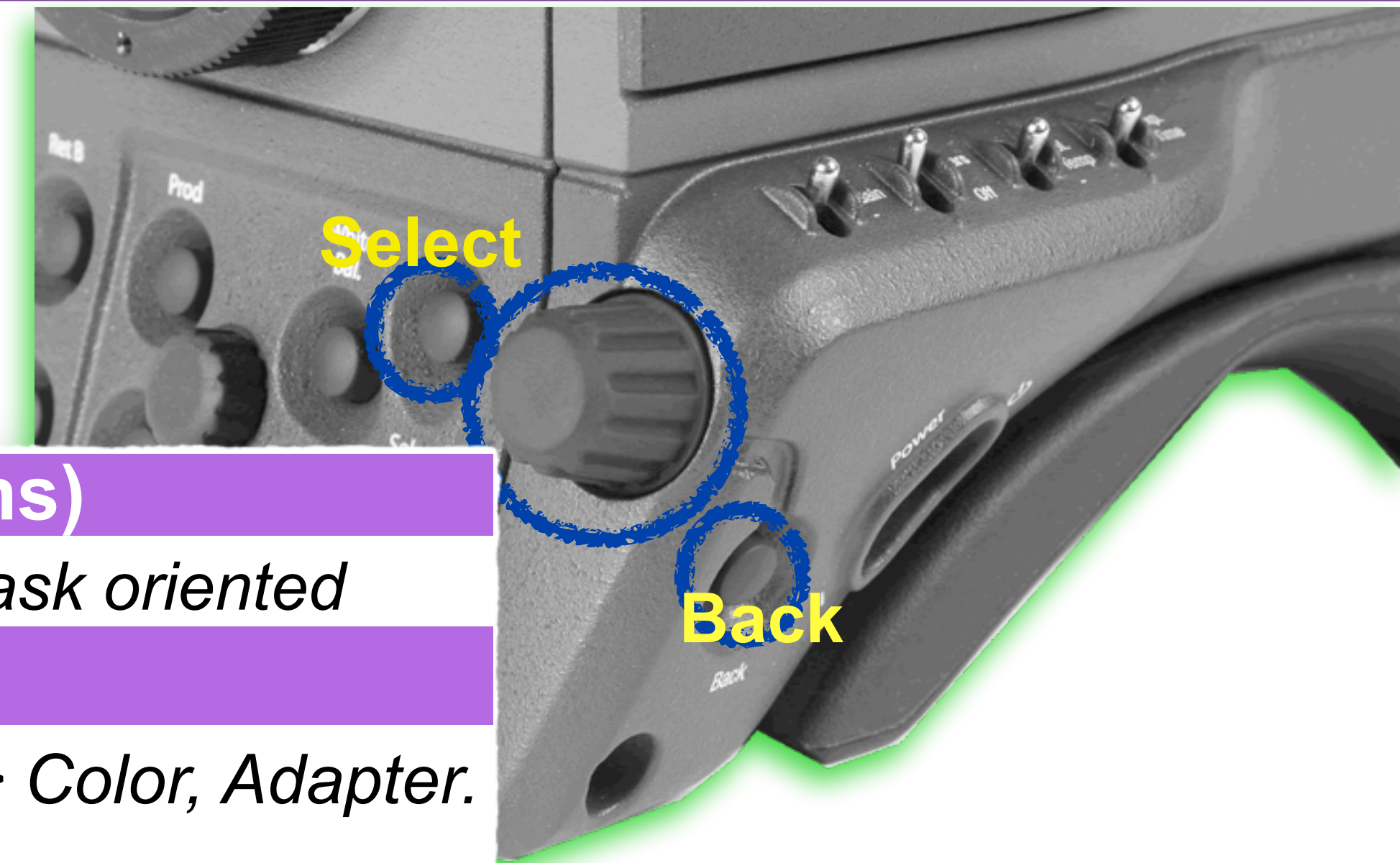
Use of correct units, ranges and values: mV, dB, %, -15..15, 0..100%.

- **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

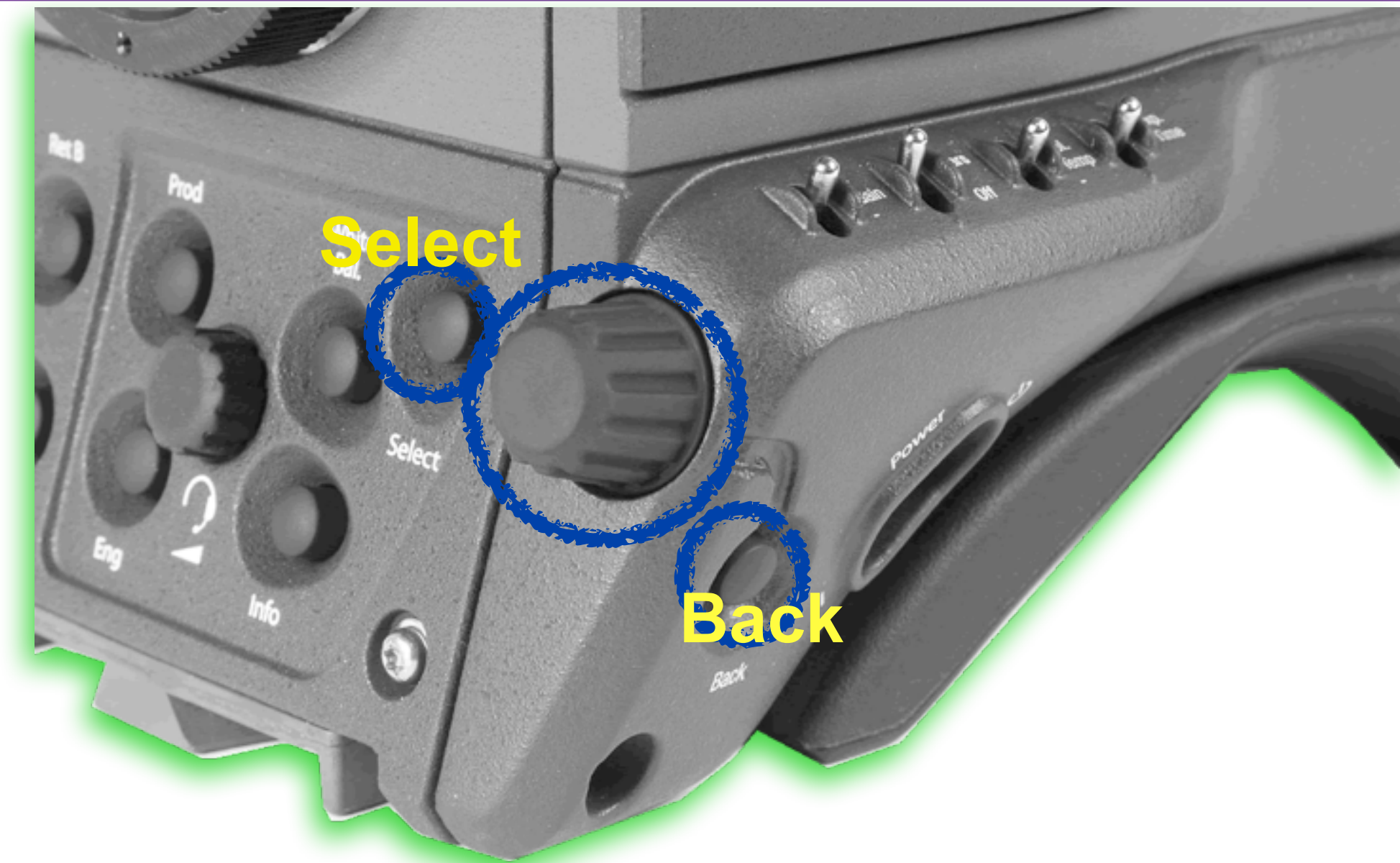
Practical user oriented Menu.

- 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

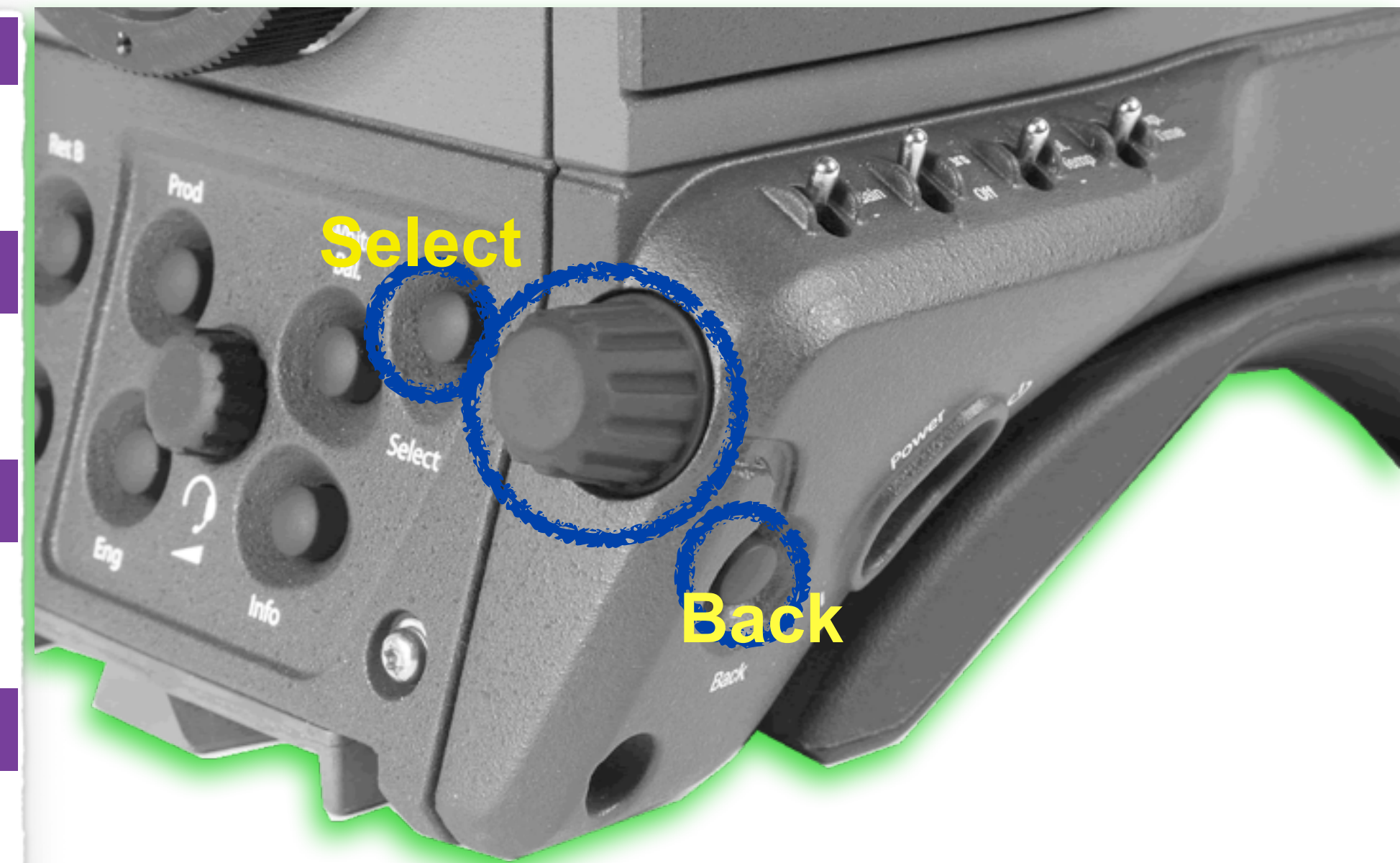
Service related information

Camera diagnostics,

Extensive diagnostic features to be added later

● Service

Service related information



Scenefile handling

Locations of the functions

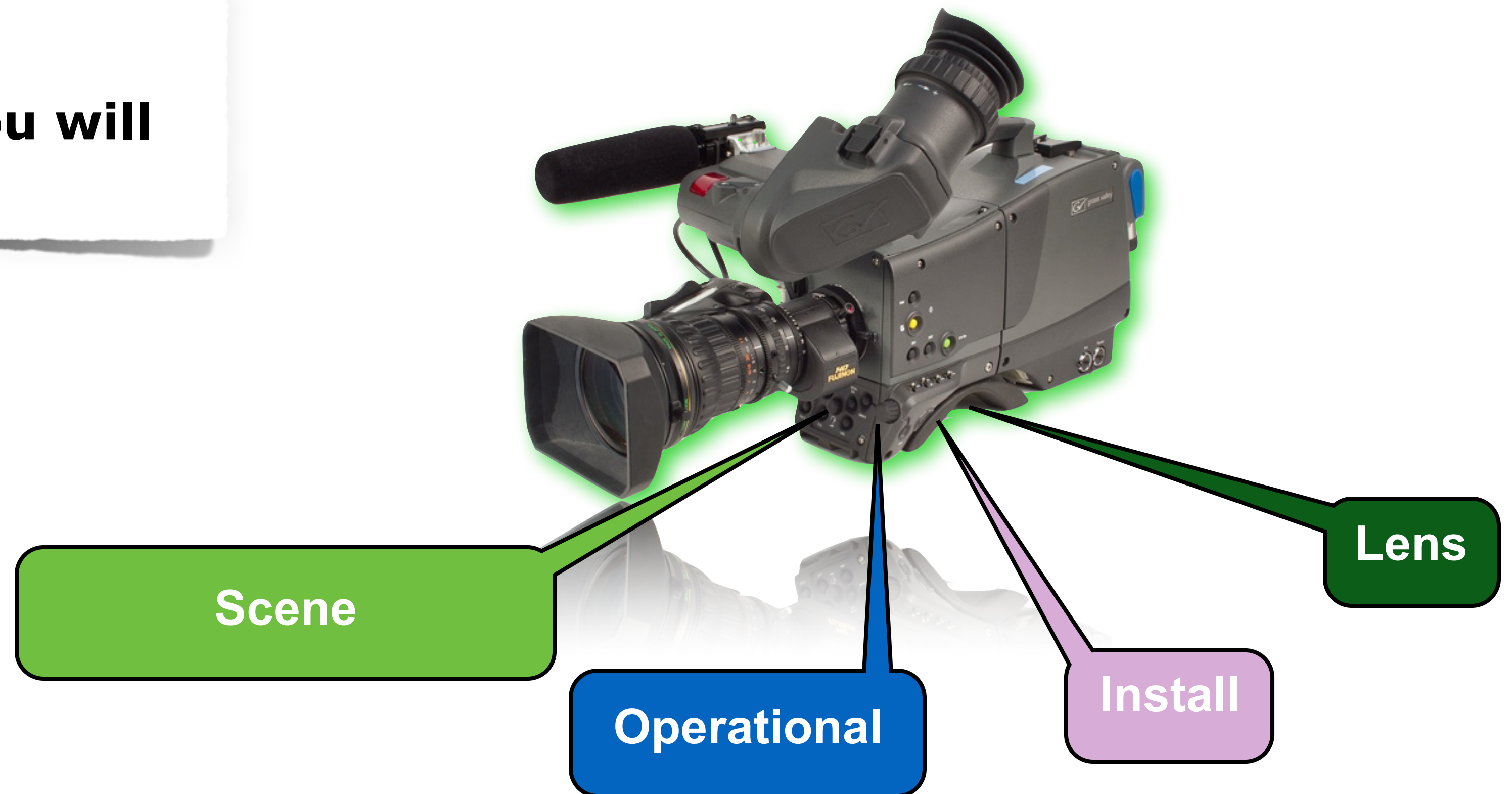
In the camera system (Head) you will find 4 different function groups

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		<i>SD</i>			<i>SD</i>				
	Black/Flare									
	Colors/Matrix									
Operational	VF settings									
	Intercom									
	Audio			<i>Remote</i>			<i>Remote</i>			
	Diagnostics			<i>Basic</i>			<i>Basic</i>			
Install	Video modes									
	Timing									
Lens	White Shading									

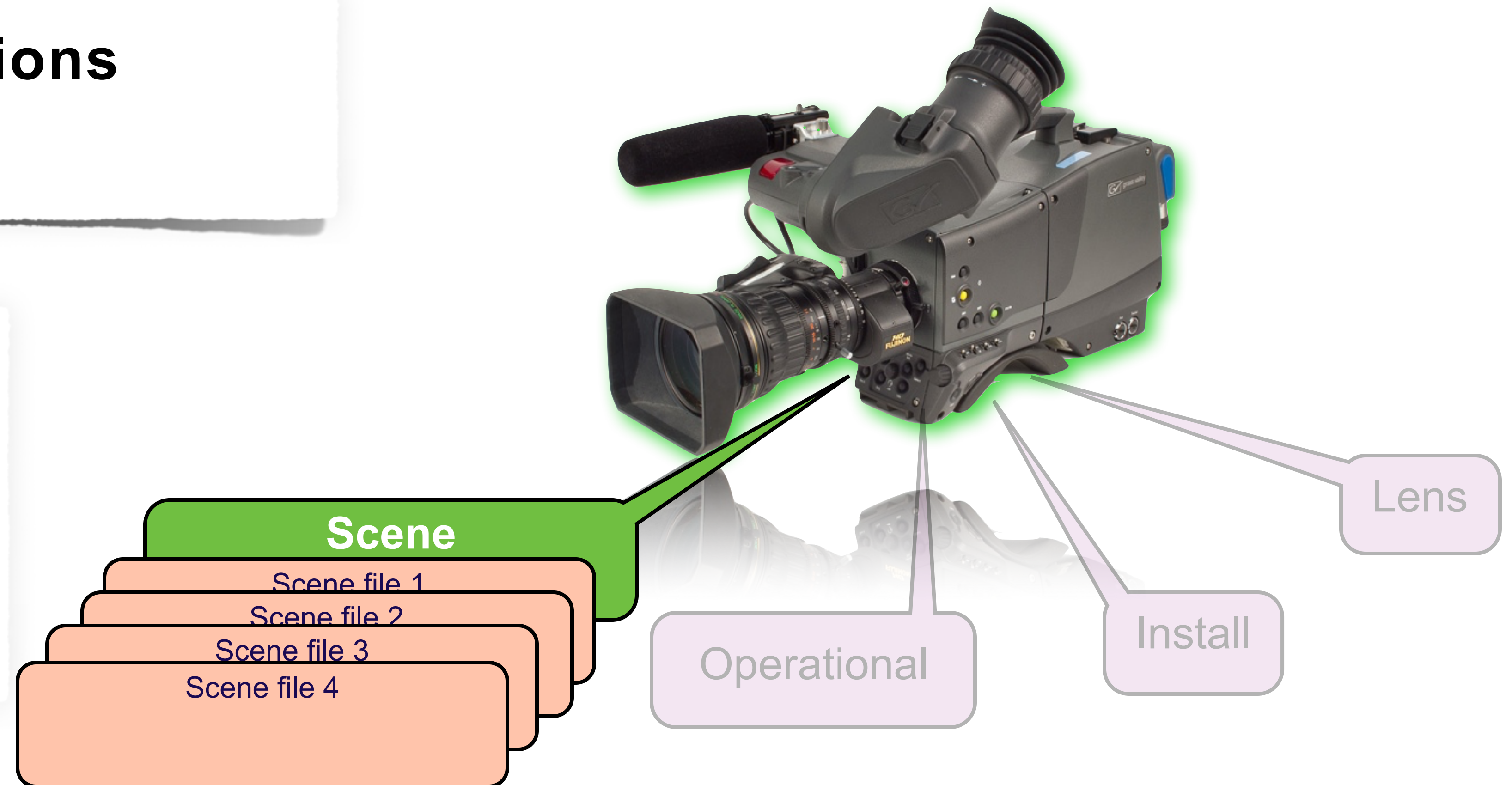
Scenefile handling

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

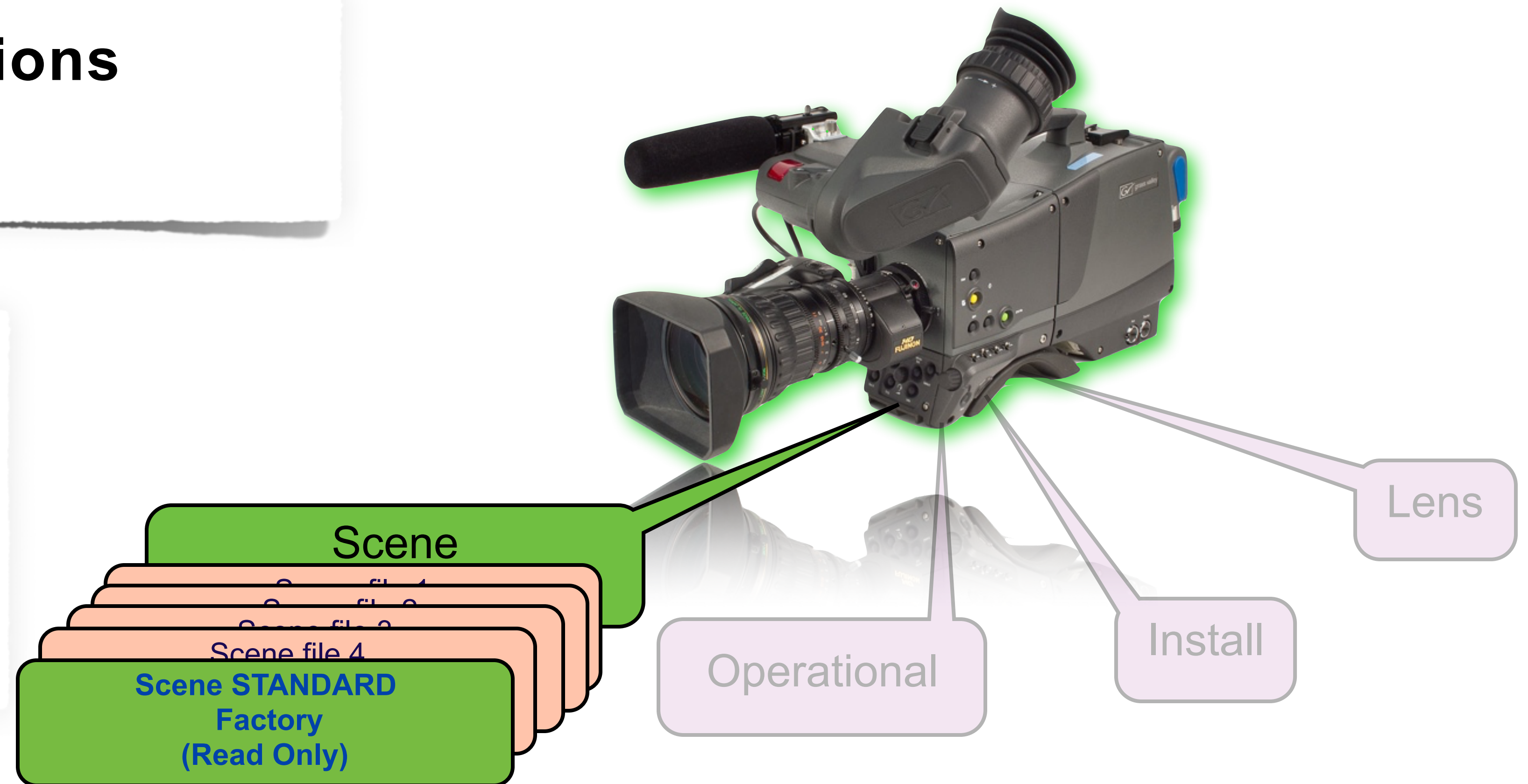
Scenefile handling

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

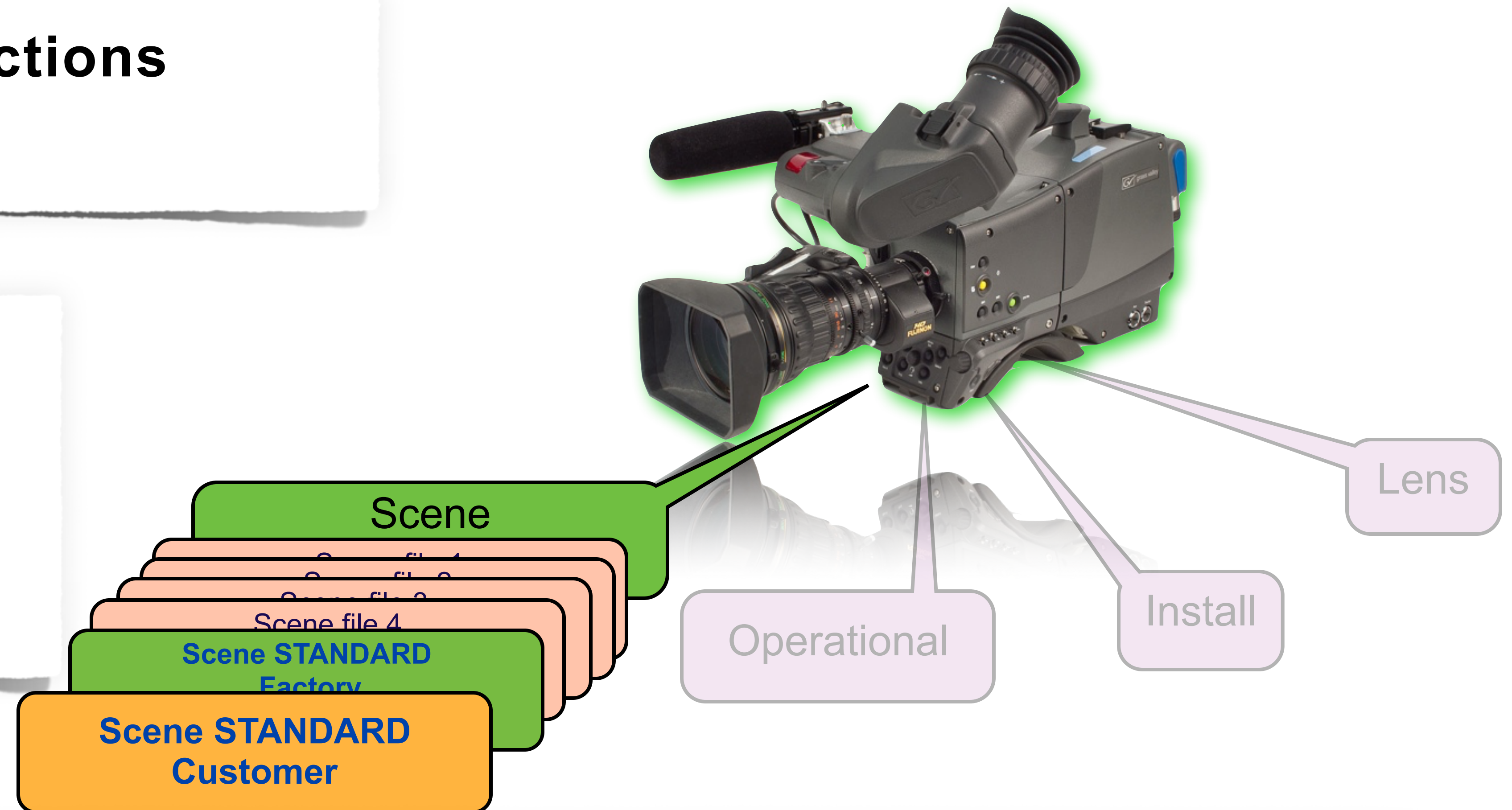
Scenefile handling

Locations of the functions The Scene file group

Scene

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

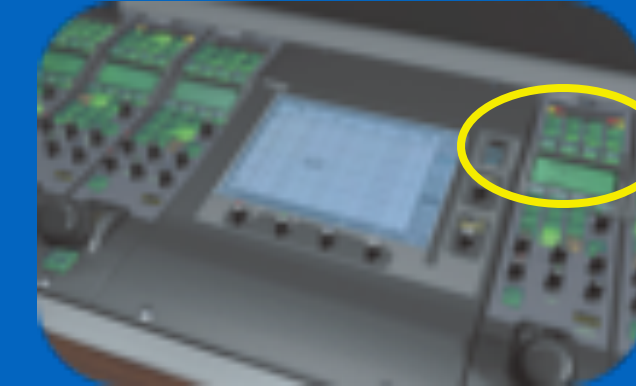
Gains/Blacks/Gamma/Knee/Detail etc



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

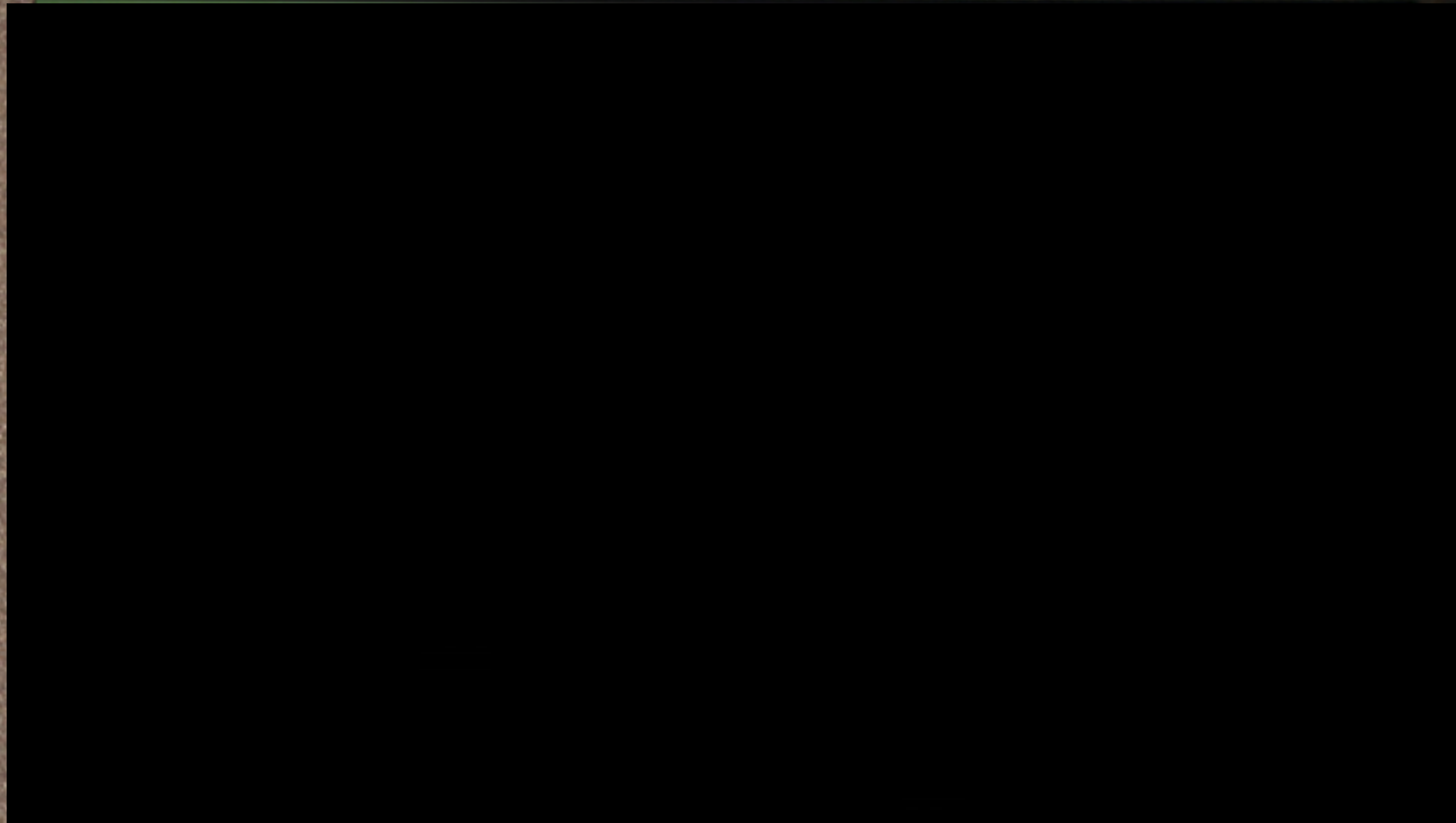
MenuVideo
Flare

Flare

Generic Operational Controls

part 2 Web Training

ABC Rule Standard setting



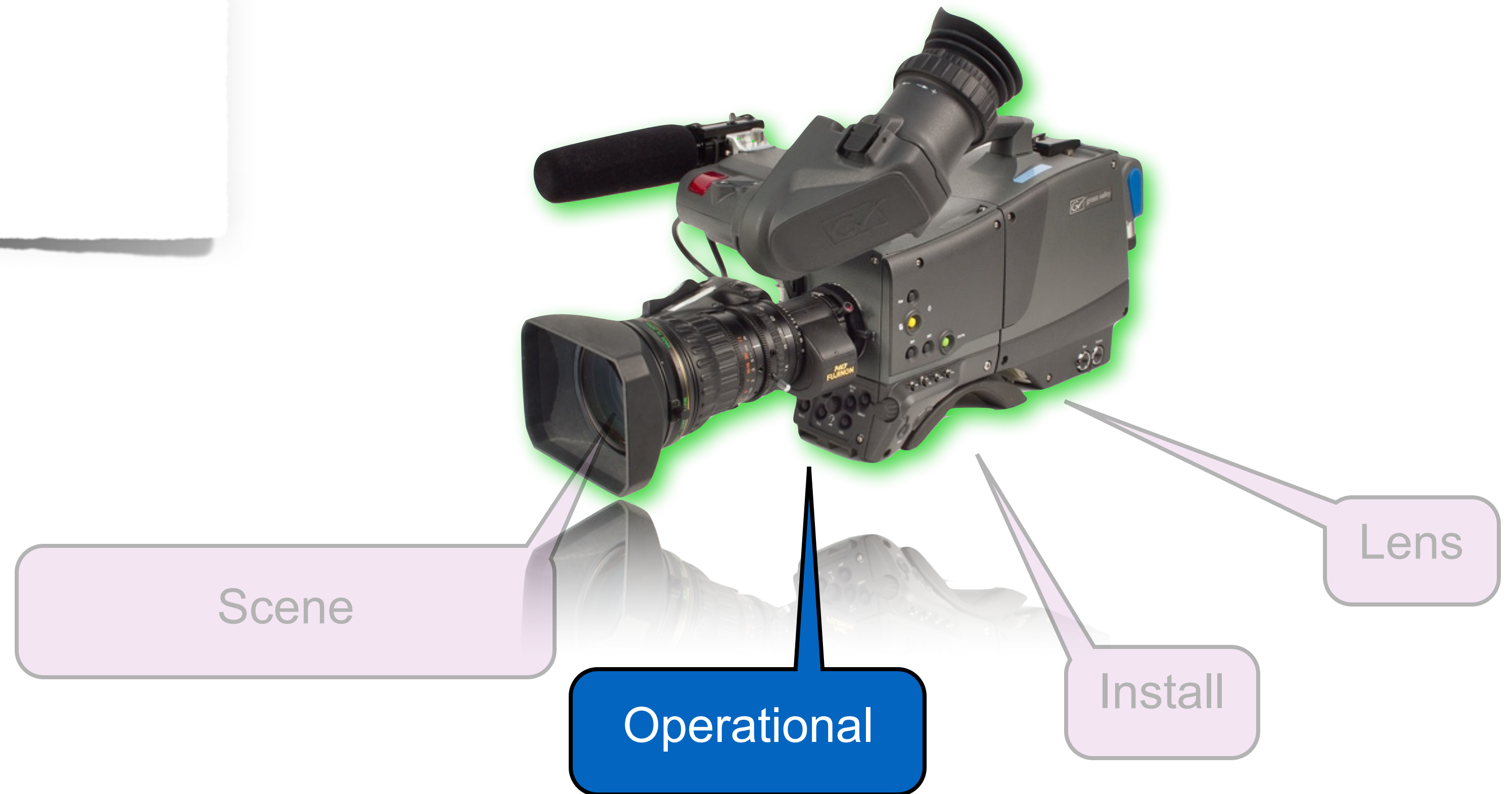
Operational file handling

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.**



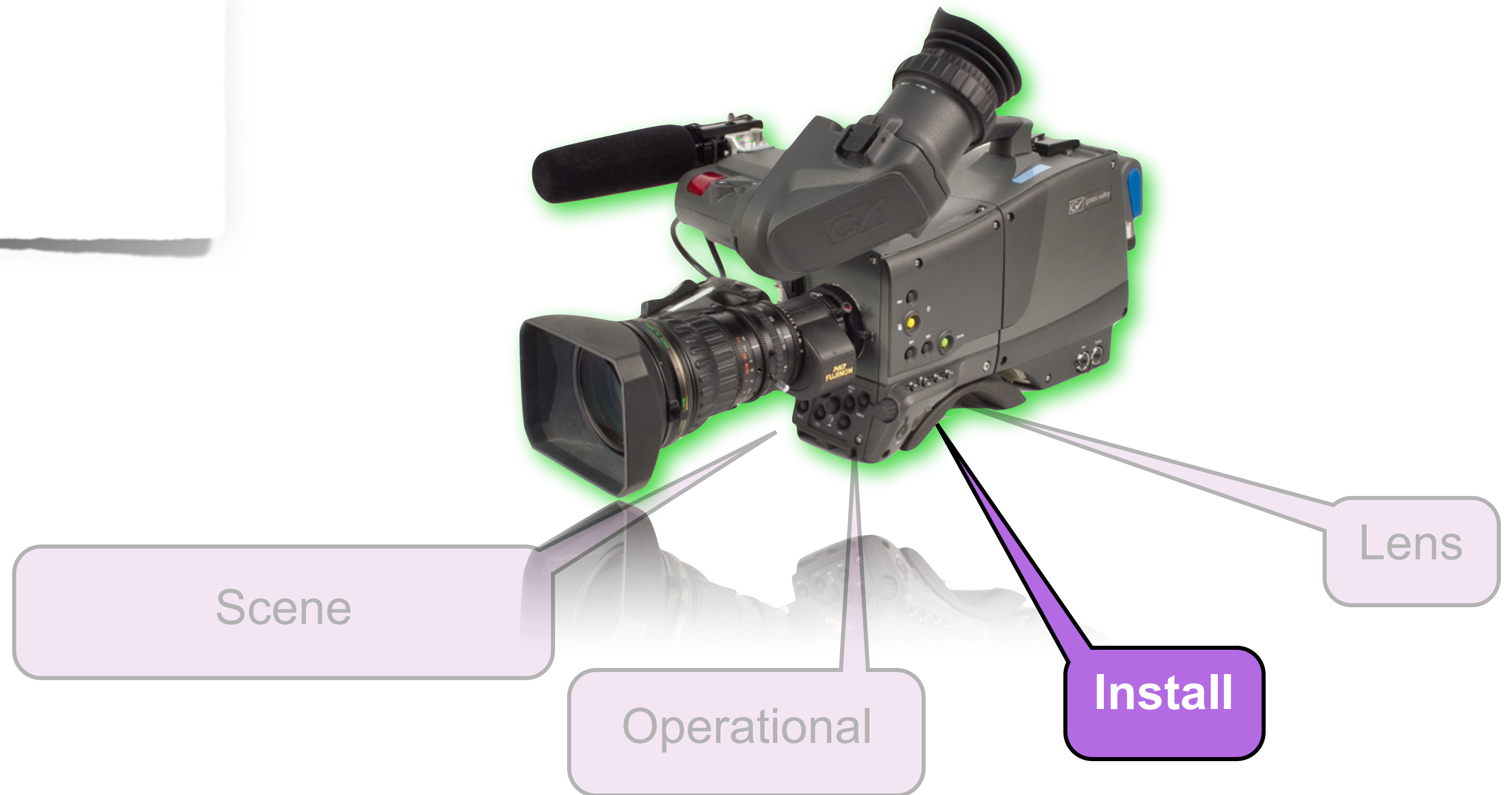
Install file handling

Locations of the functions The Install file group

Install

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

Video Modes / Timing etc



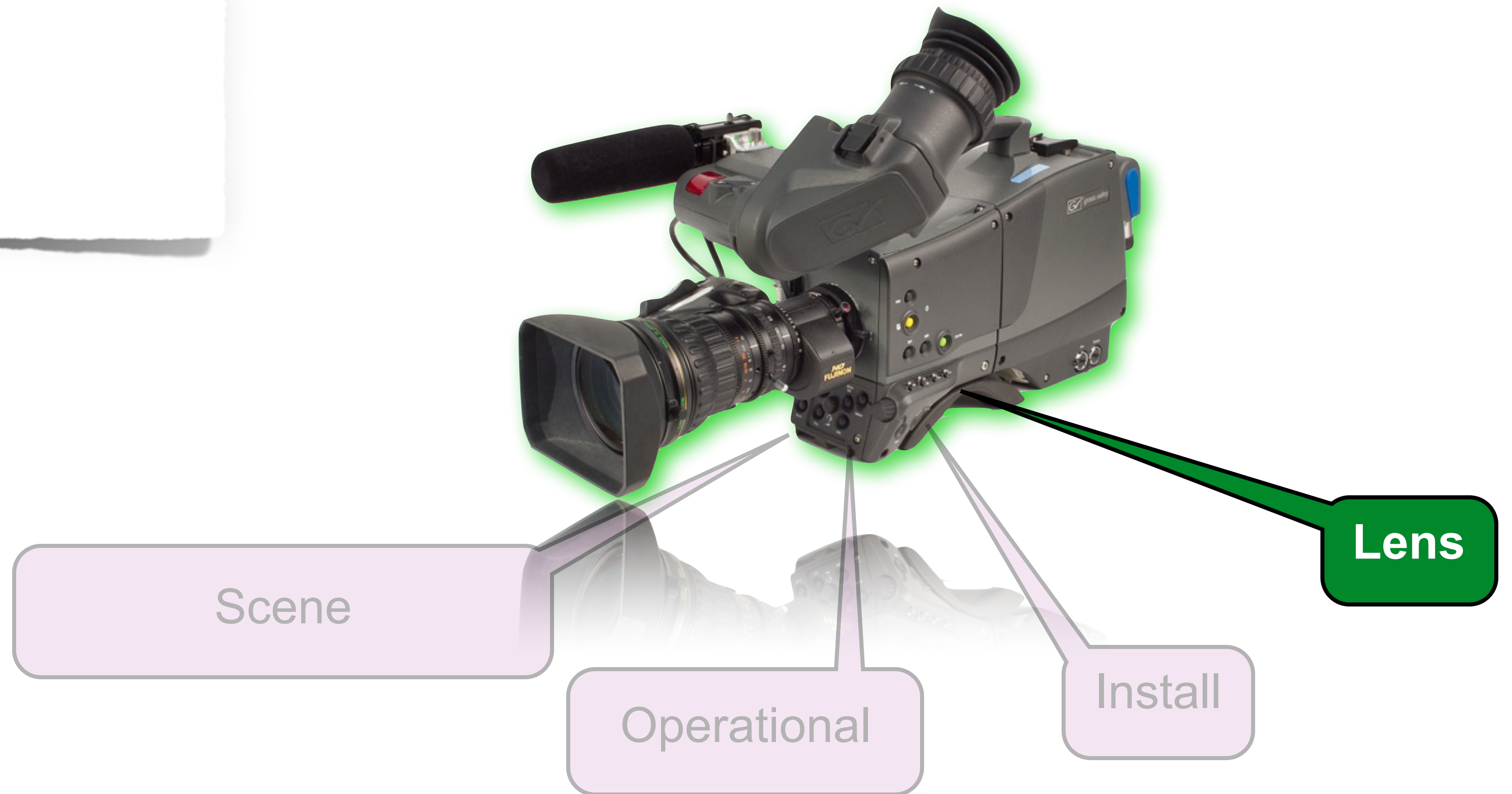
Lens file handling (not for LDK8000)

Locations of the functions The Lens file group

Lens

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

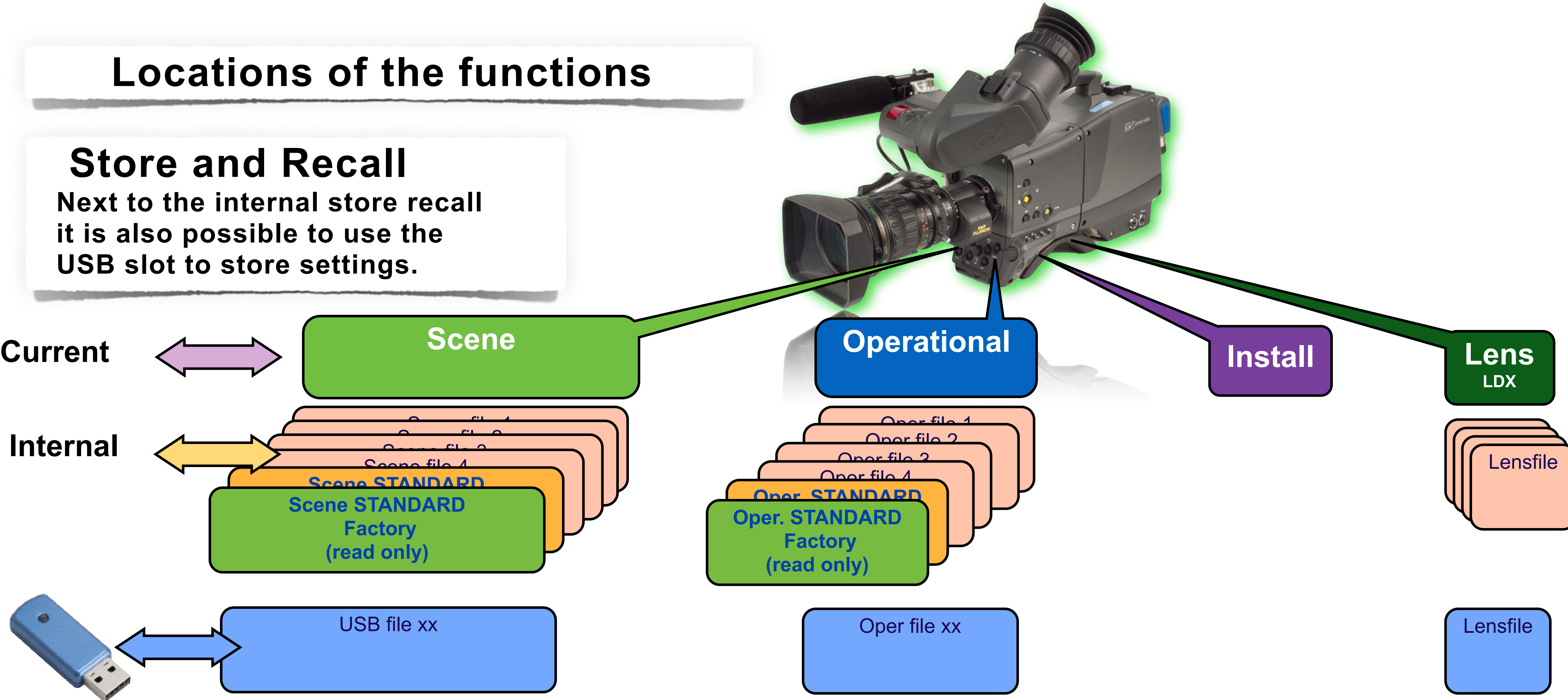
White Shading / Lens setting etc.



File handling

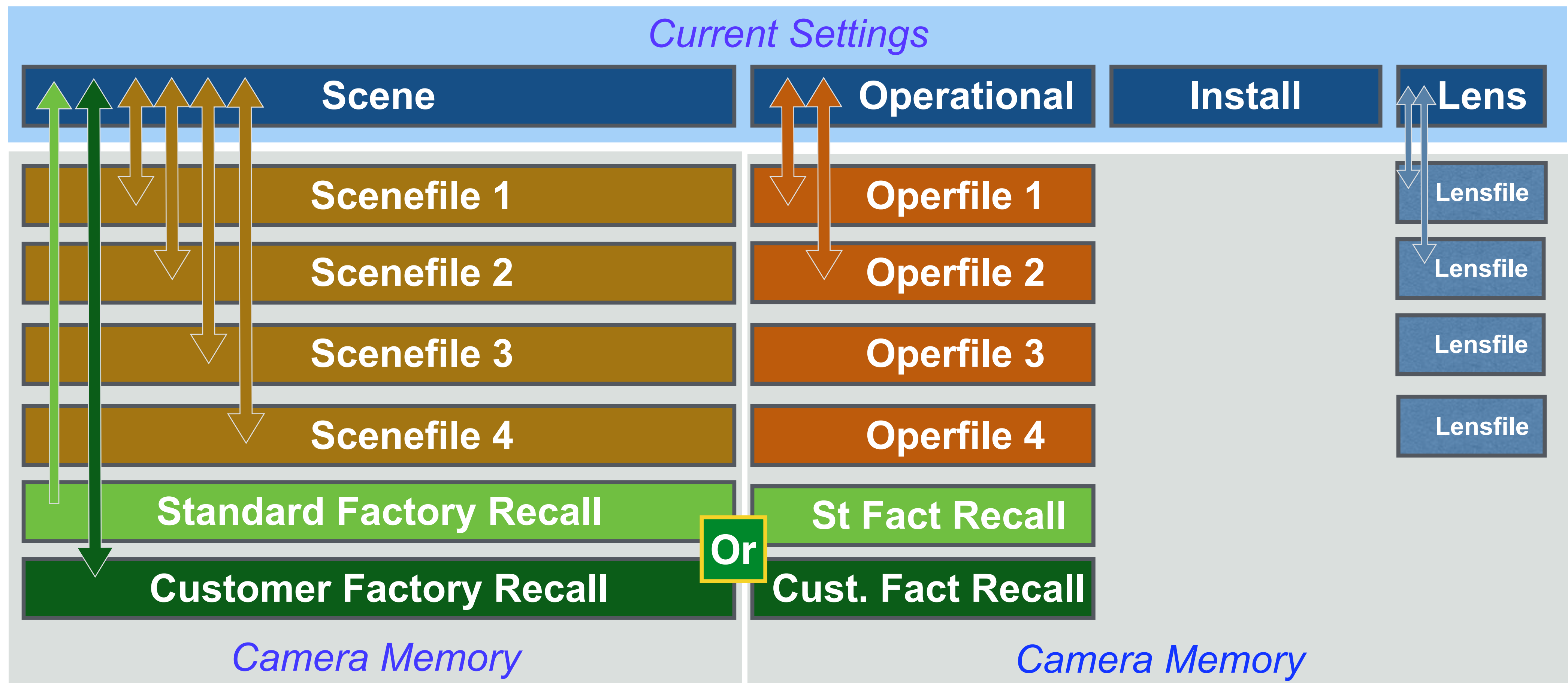
Locations of the functions

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)

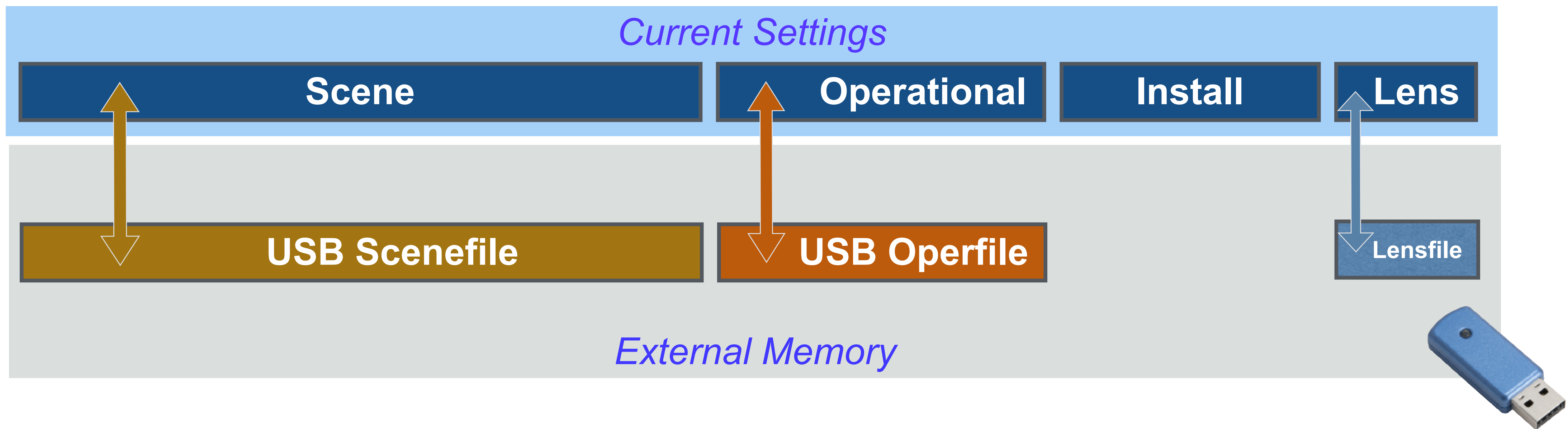
■ In camera function parameter



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

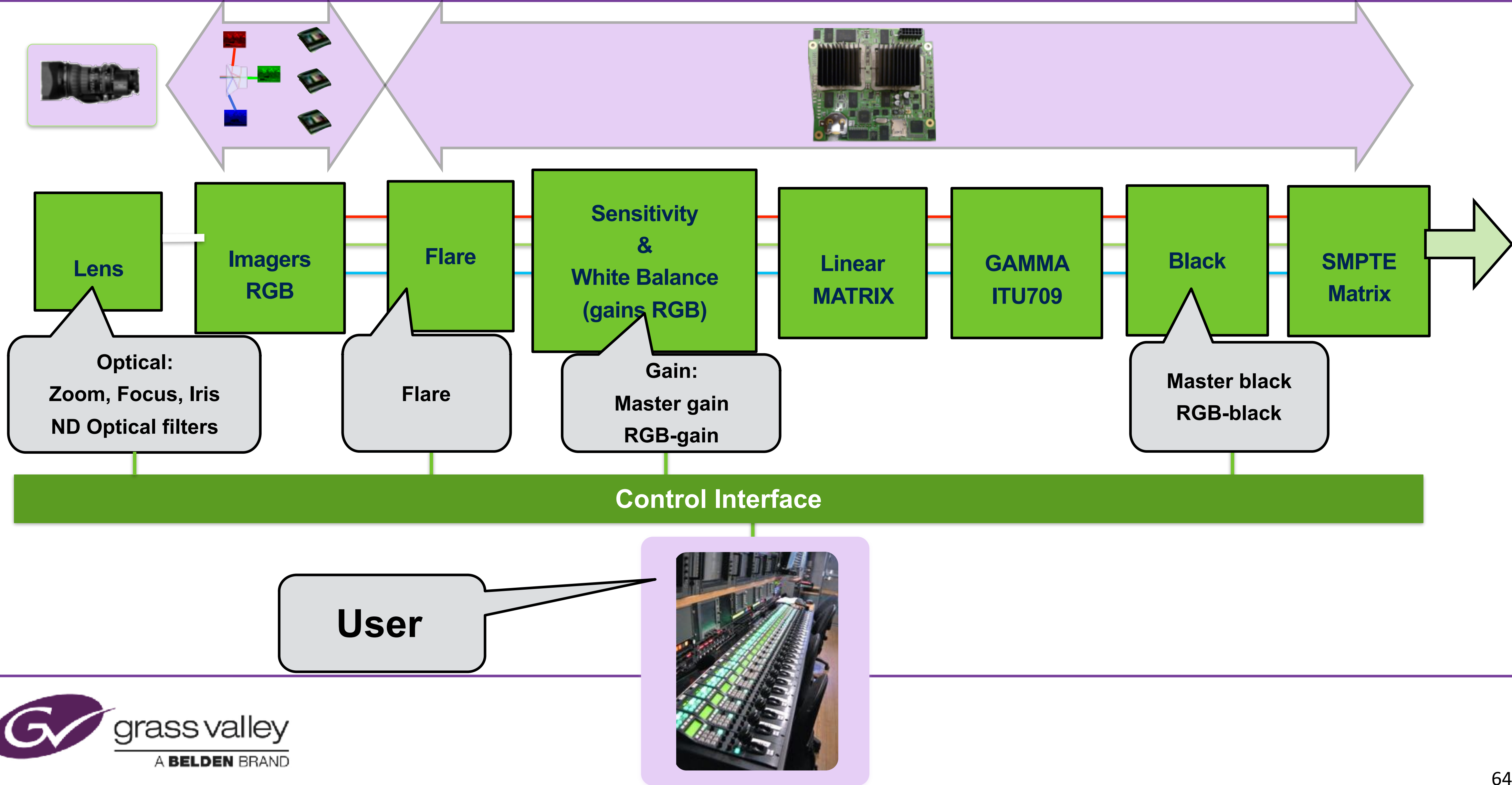
Grass Valley Cameras File handling

Tryout

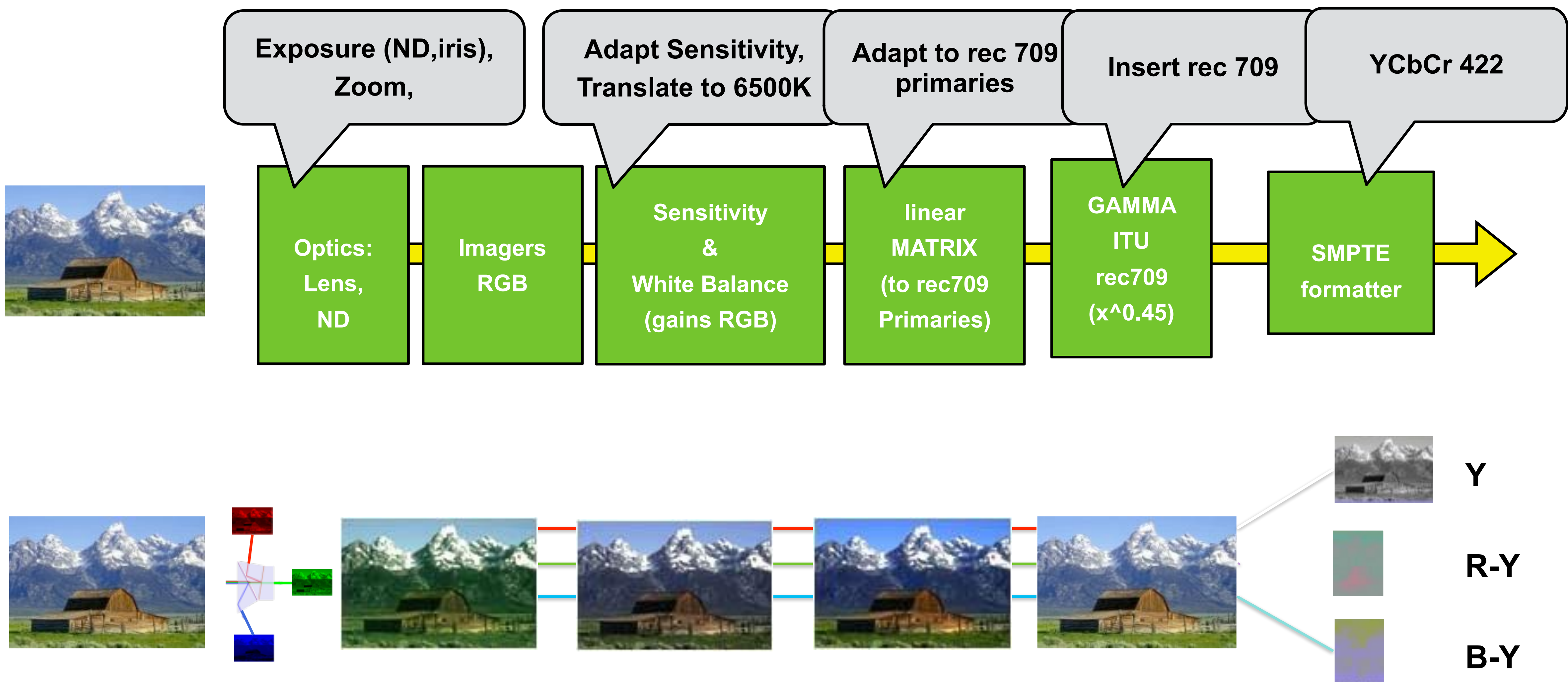
		STORE / RECALL		
		USB	Smart CARD	USB
		CAM	OCP	MCP450
Scene Video parameters	Gains			
	Gamma			
	Knee			
	Details			
	Black/Flare			
	Colors/Matrix			
Operational	VF settings			
	Intercom			
	Audio			
	Diagnostics			
Install	Video modes			
	Timing			
Lens	White Shading			

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

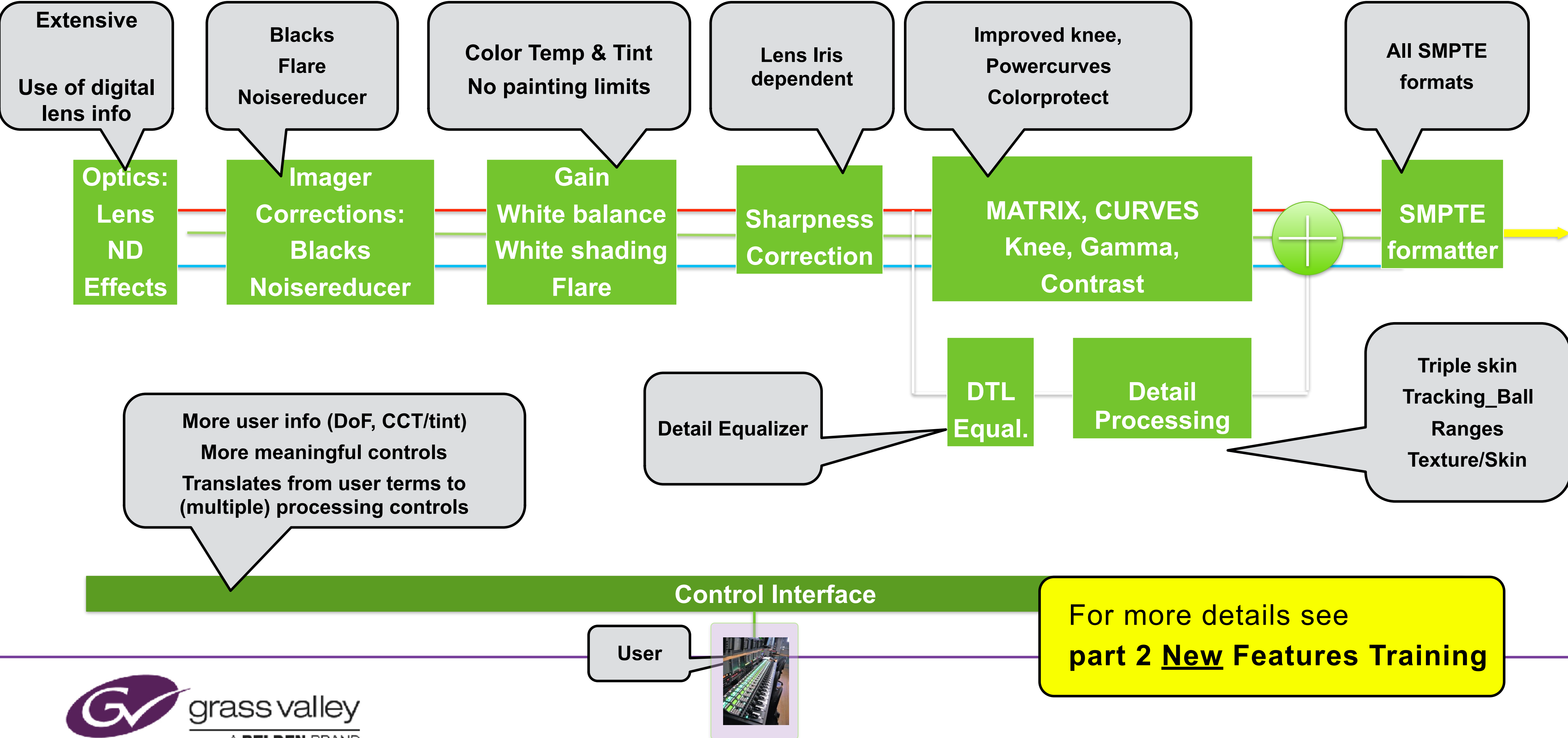
Generic Operational Controls (Overview)



Generic Operational Controls (Overview)



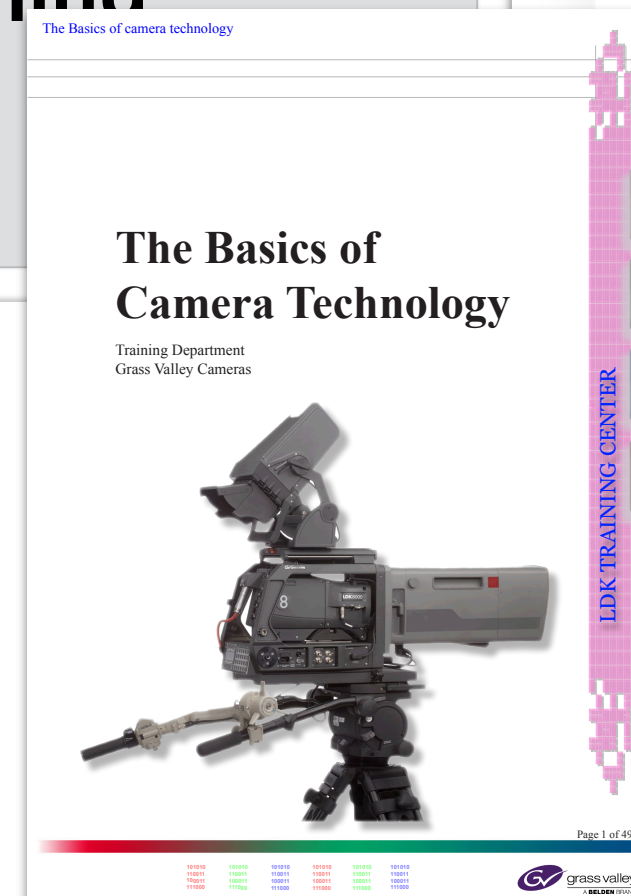
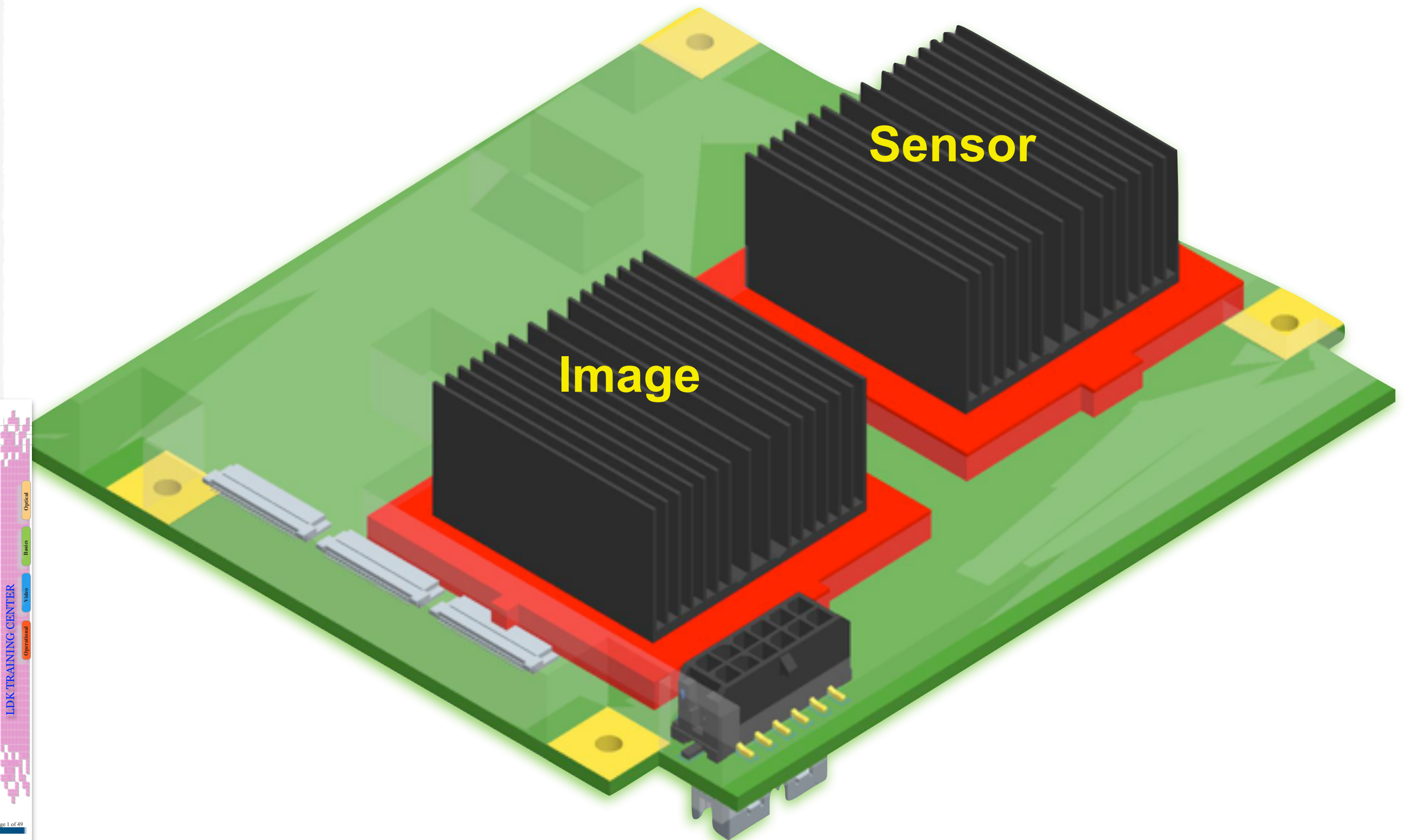
Generic Operational Controls (and More)



- 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

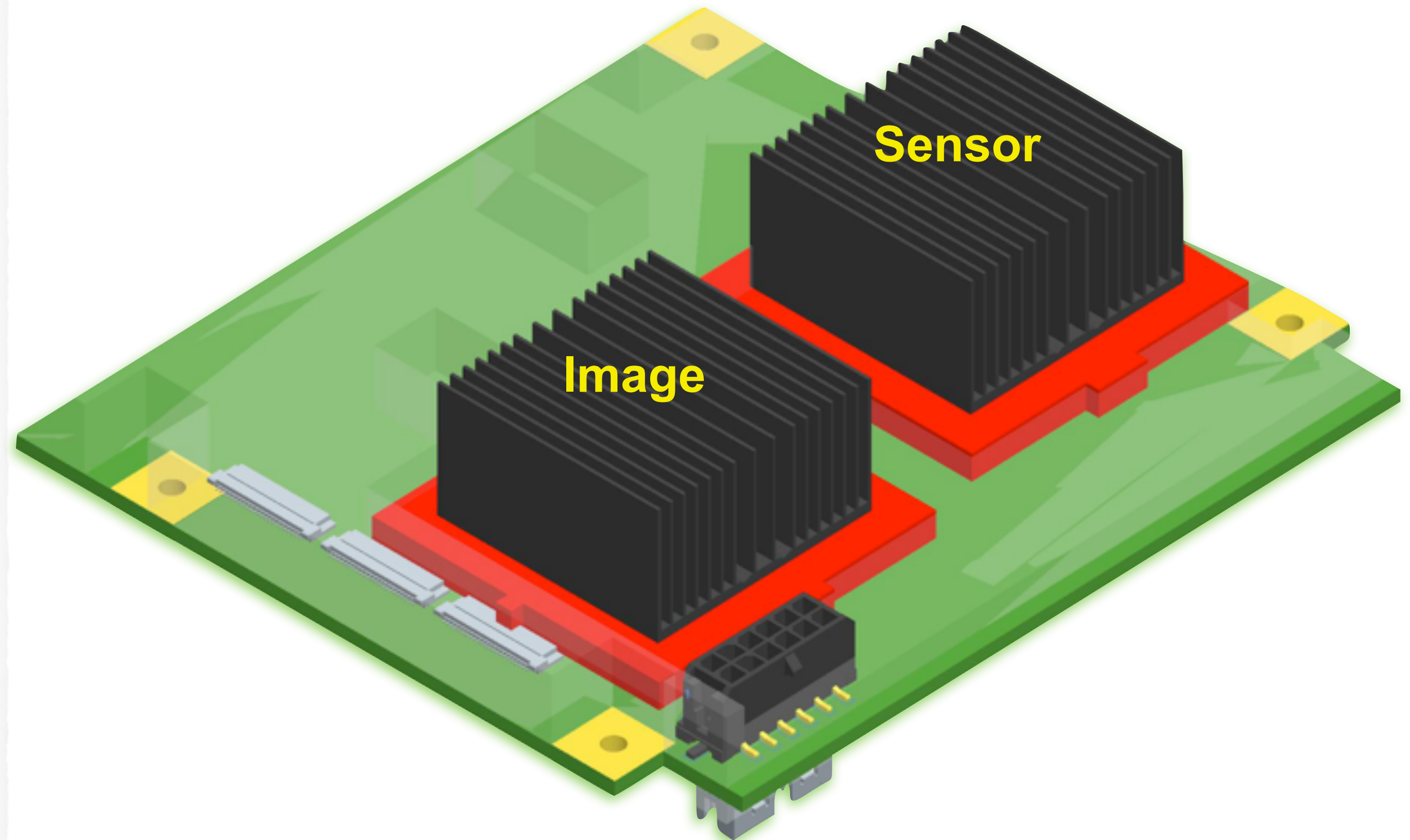


Functional LDX series

- **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

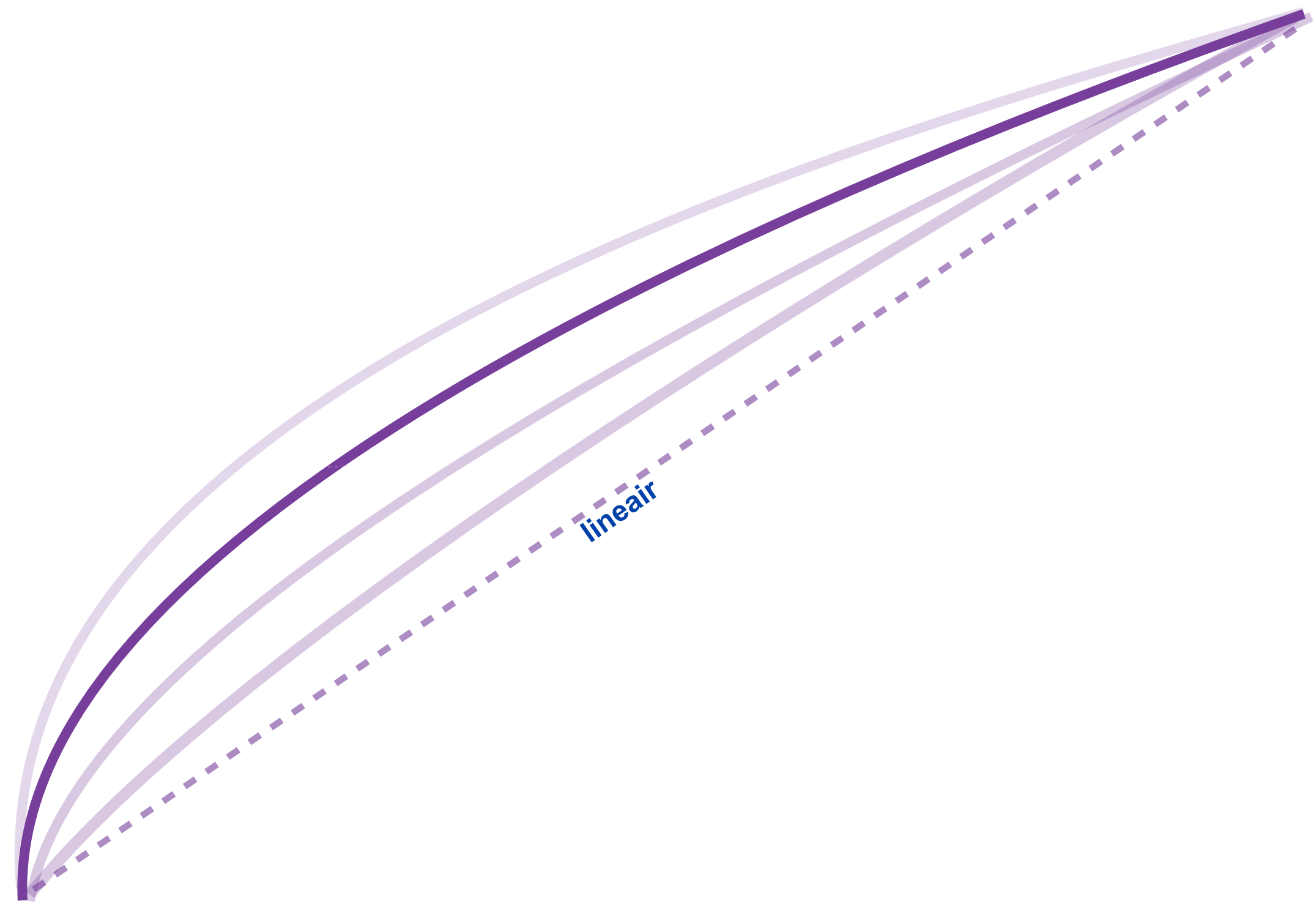


Functional LDX series

Basics Video / Image processing

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

Gamma Curve

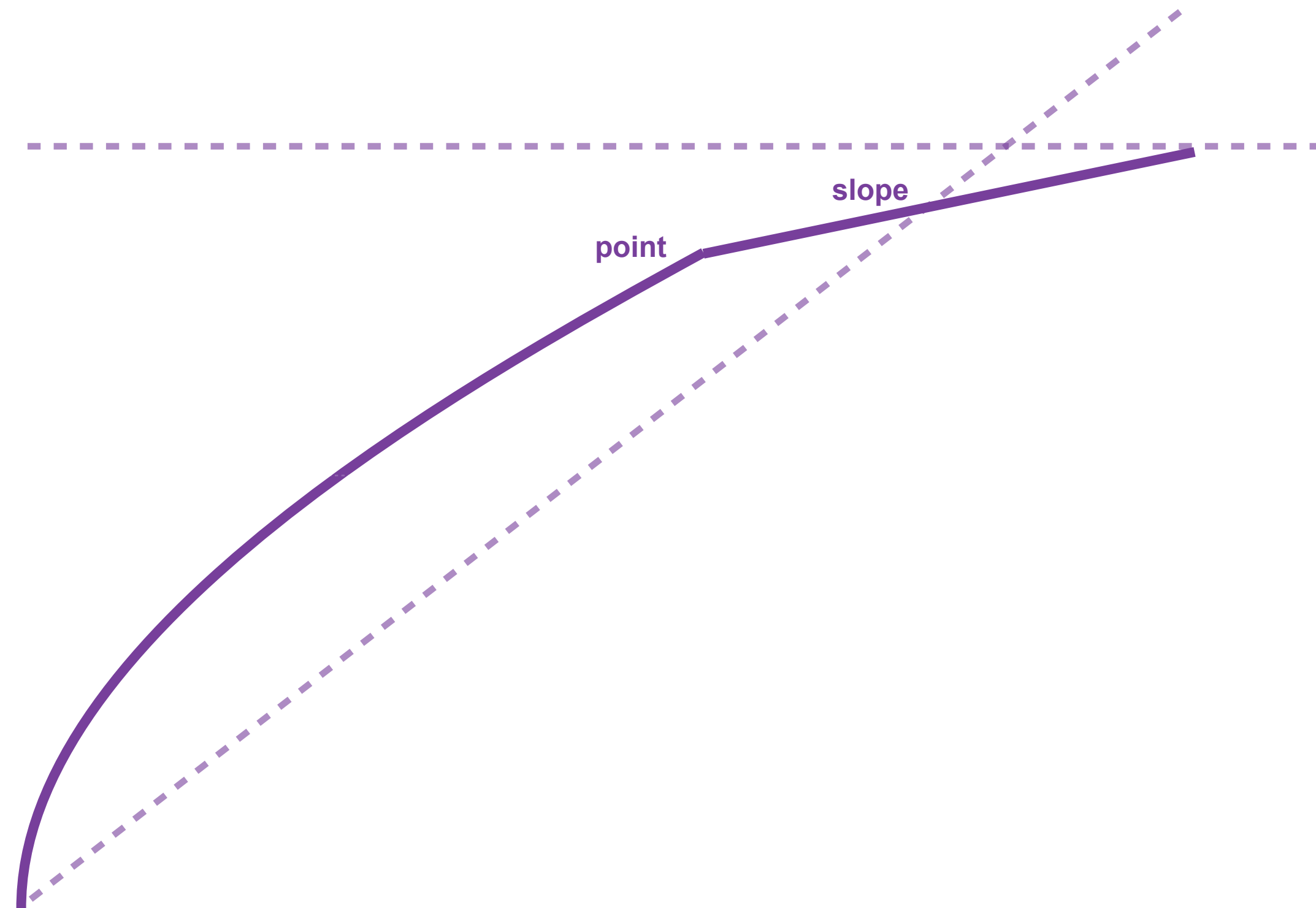


Functional LDX series

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

Basics Video / Image processing

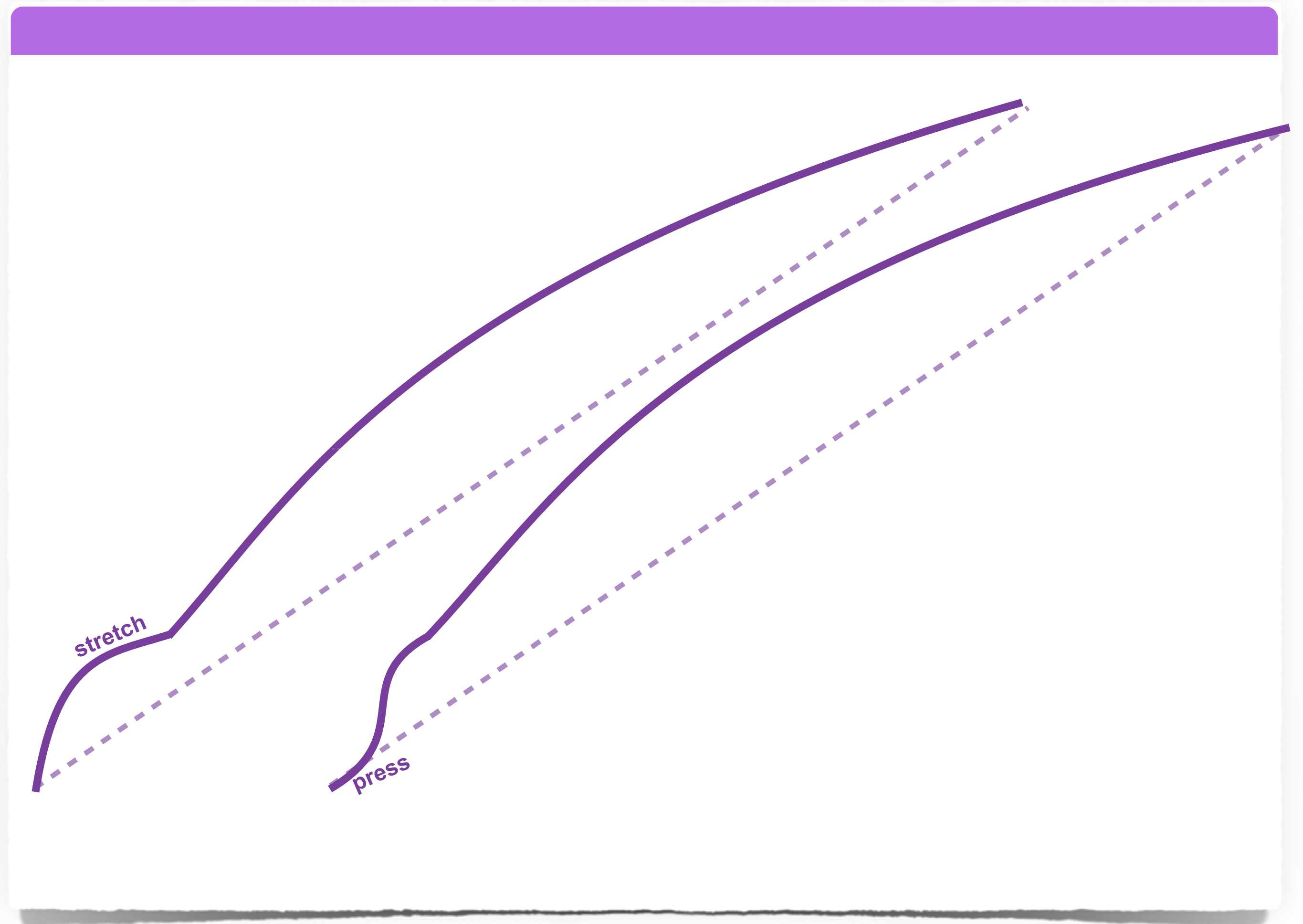
Knee



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

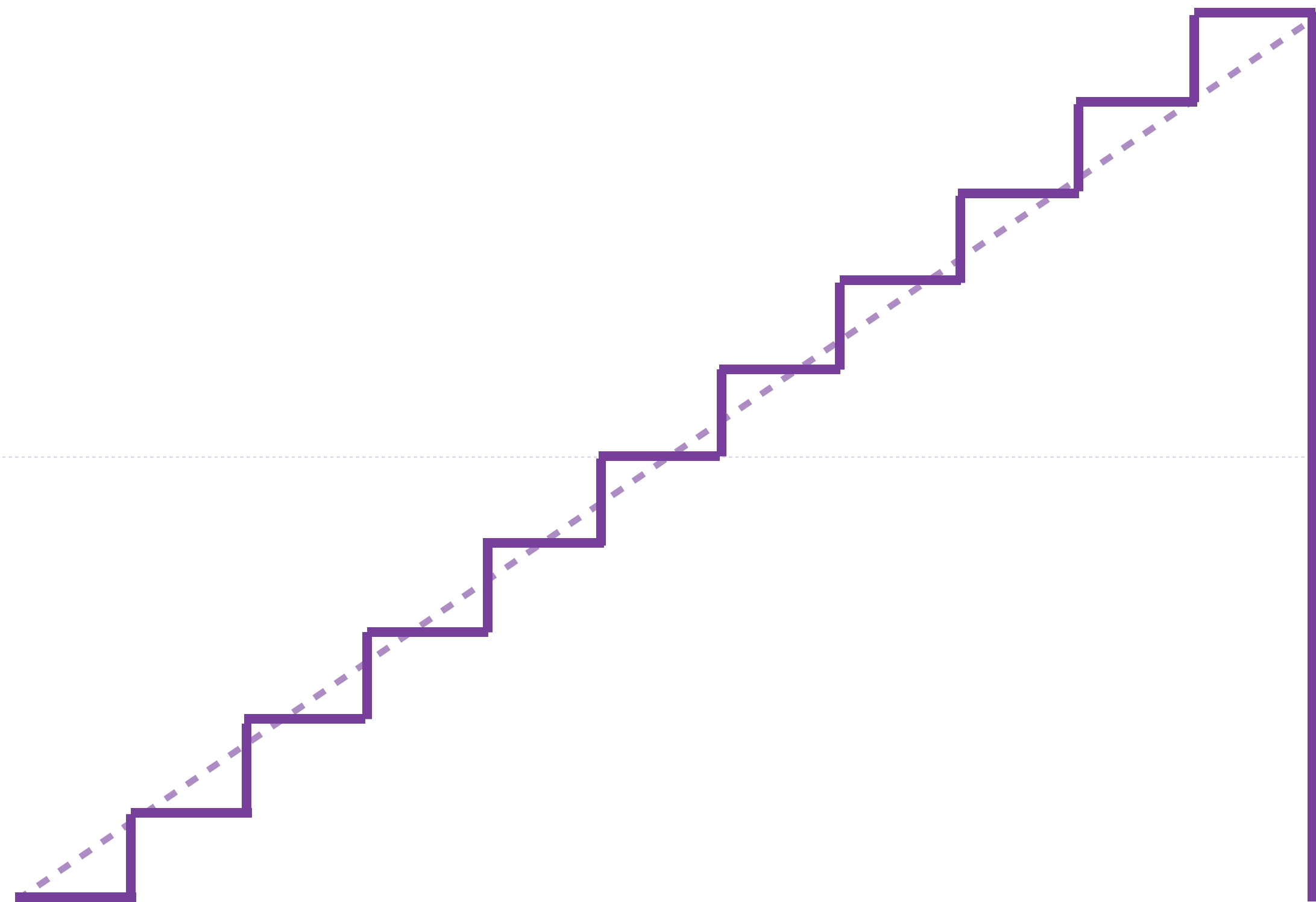


Functional LDX series

- *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

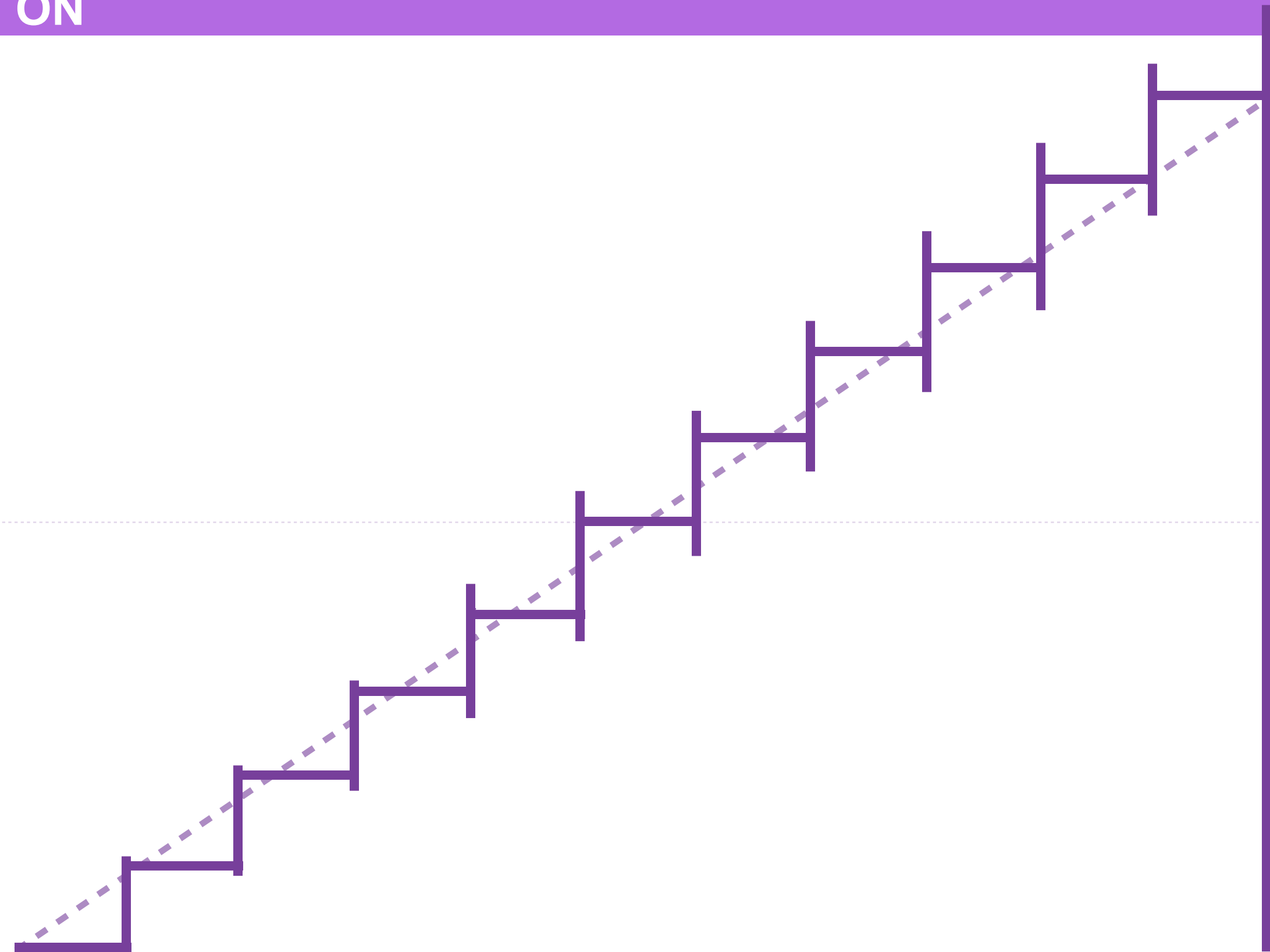


Functional LDX series

- *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

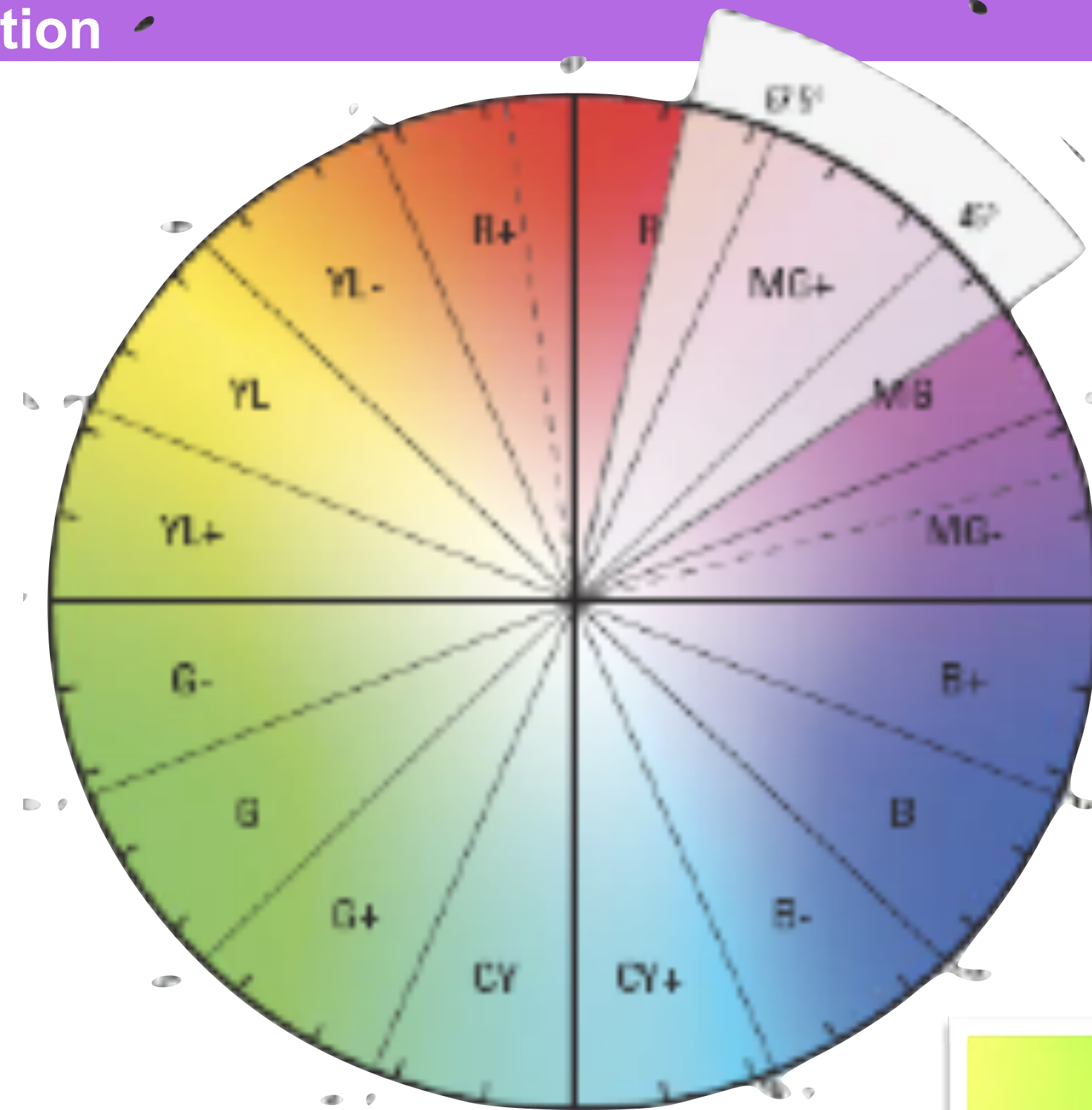


Functional LDX series

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

Basics Video / Image processing

Color Correction

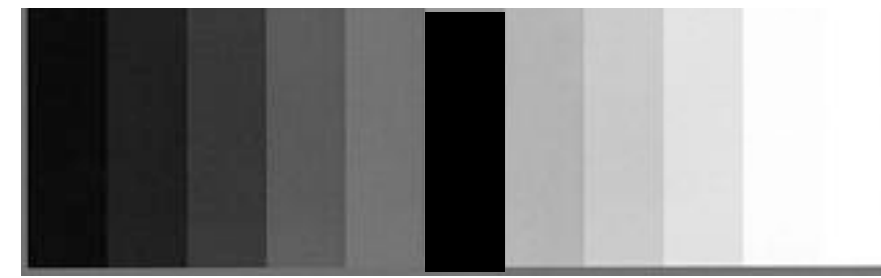


Functional LDX series

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

Basics Video / Image processing

Flare

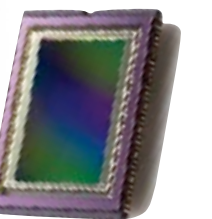
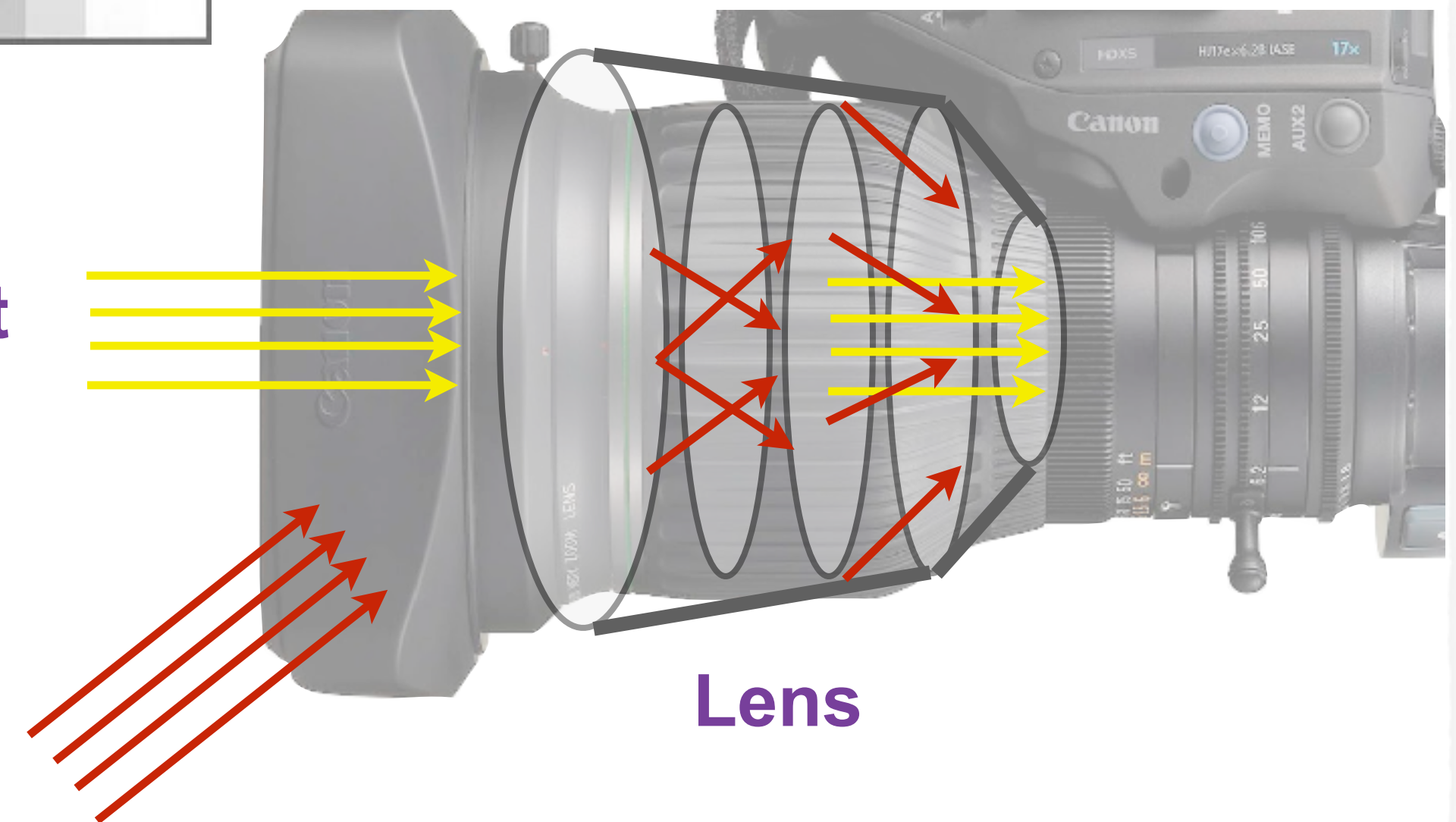


→ Direct Light

→ Reflected Light

Reflected Light could
change the blacks

Light



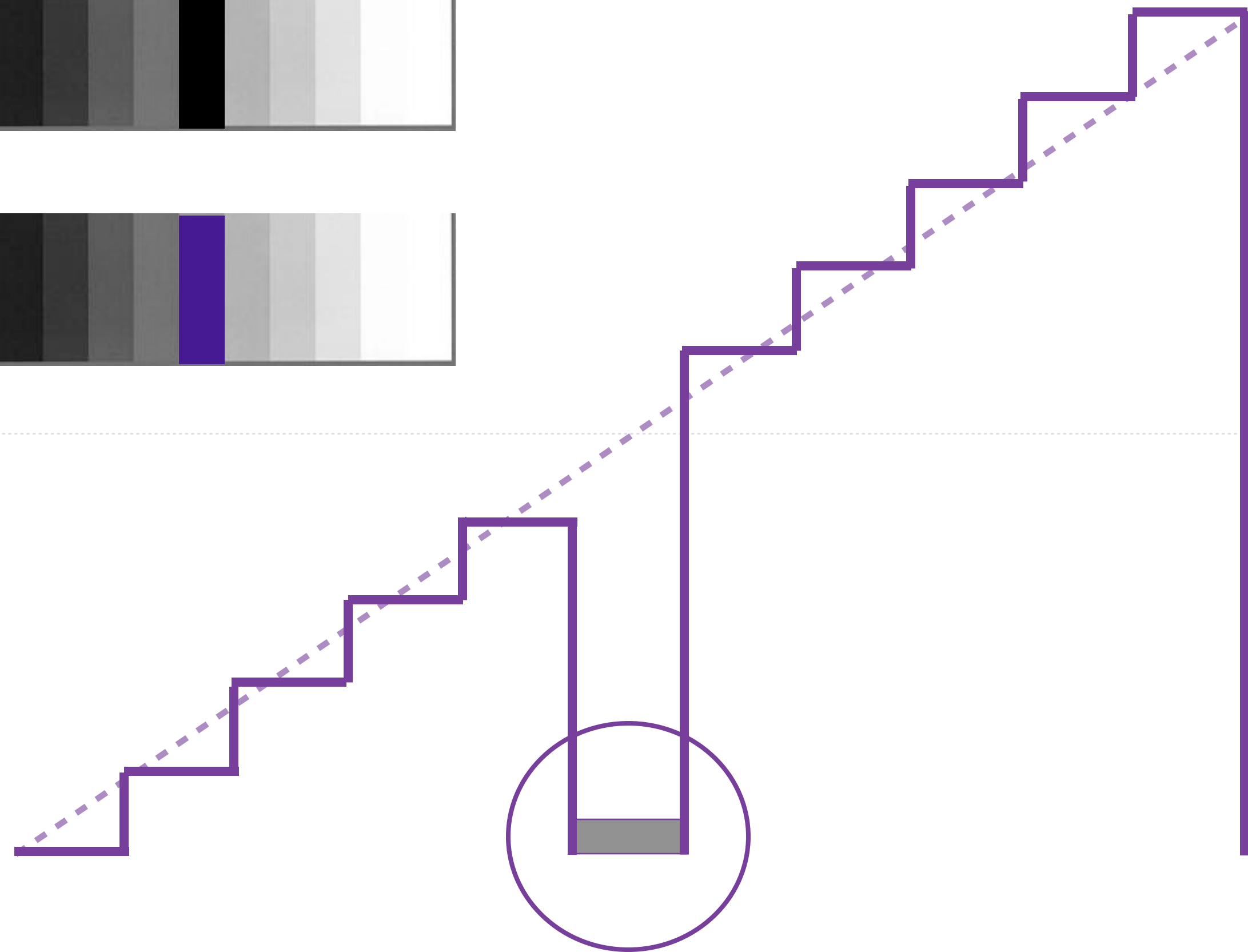
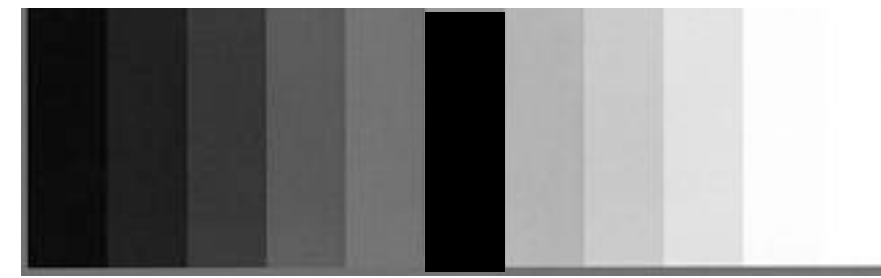
Sensor

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*
- *Knee*
- *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

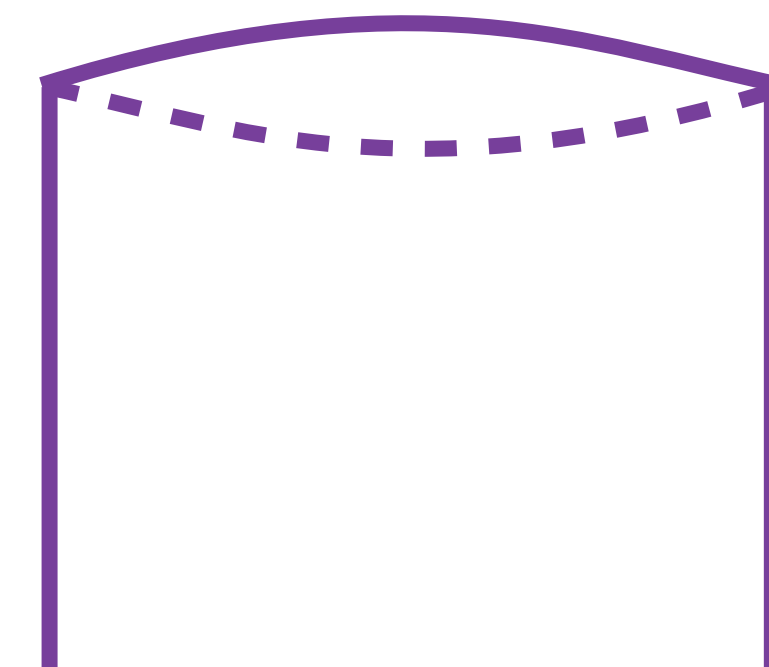
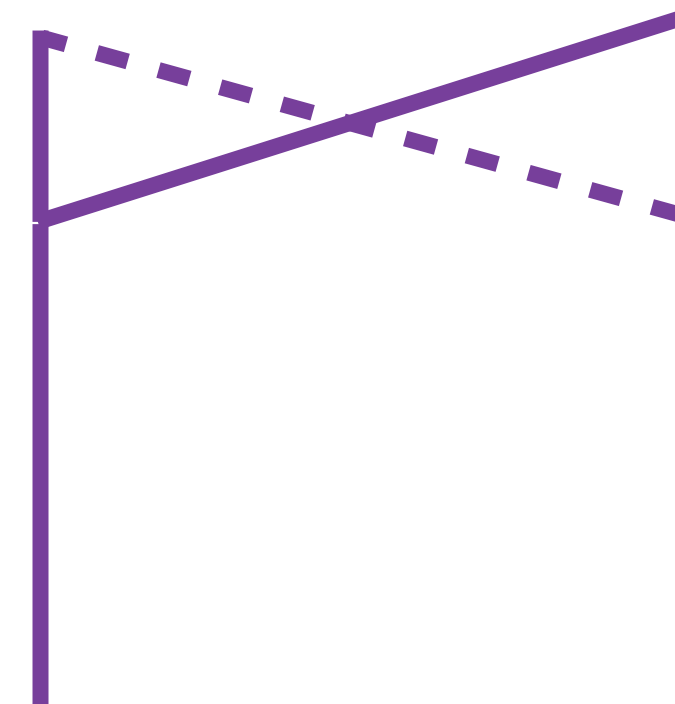
=> Basic settings

White Shading

Errors in Lens could disturb the white linearity

SAW tooth
correction

PAR able
correction

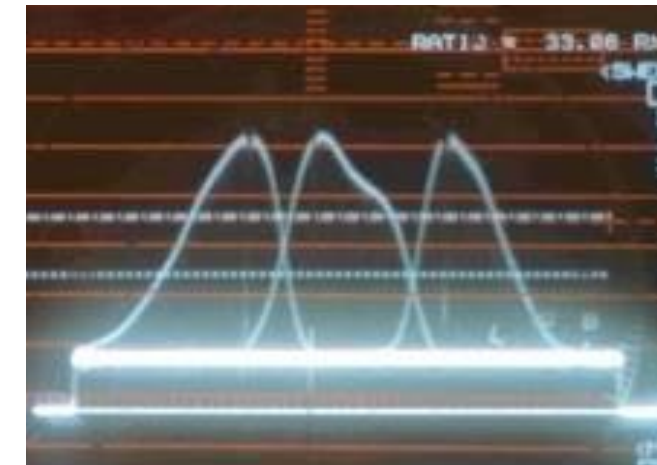


Functional LDX series

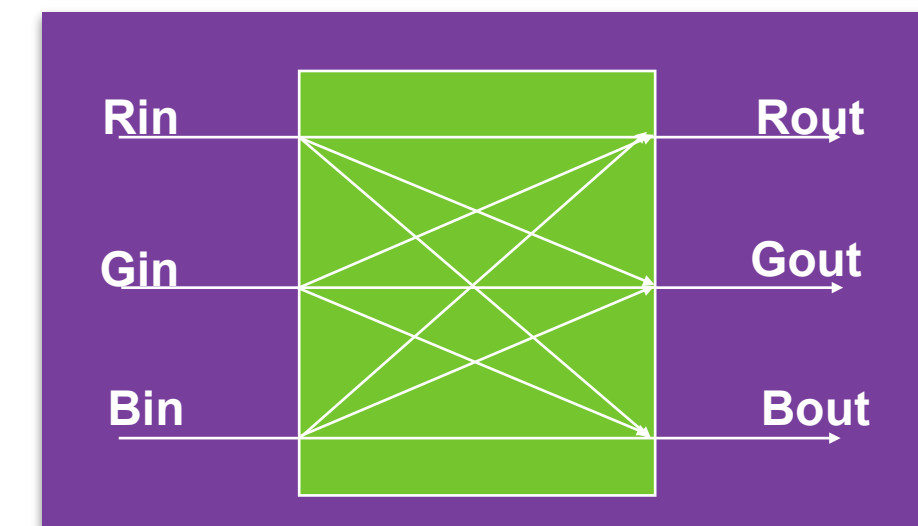
- *Gamma*
- *Knee*
- *Black Stretch*
- *Detail*
- *Color correction*
- *Flare*
- *White Shading*
- **Matrix**
- *RGB to Y/R-Y/B-Y*

Basics Video / Image processing

Matrix



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

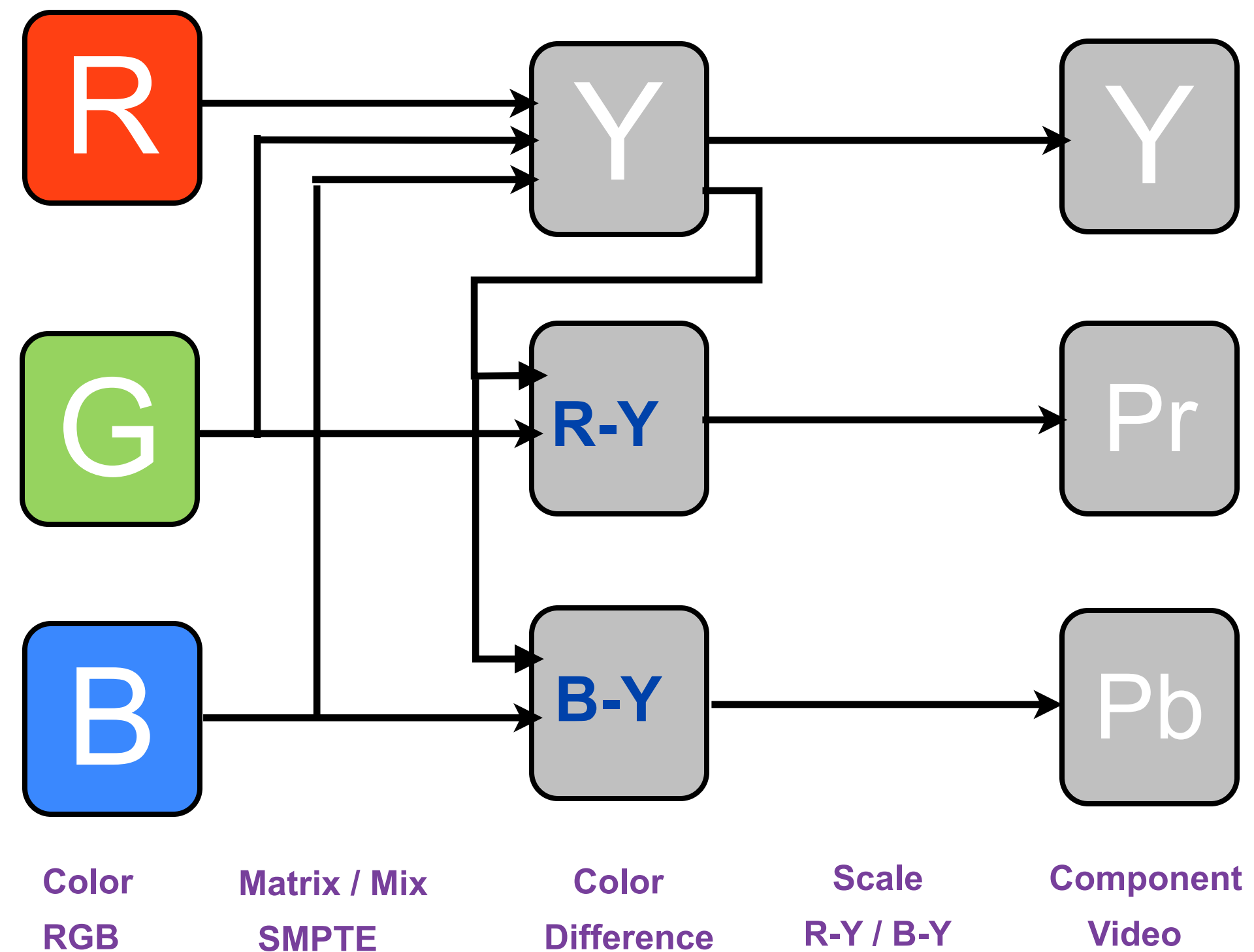


Functional LDX series

- *Gamma*
- *Knee*
- *Black Stretch*
- *Detail*
- *Color correction*
- *Flare*
- *White Shading*
- *Matrix*
- **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

