

Camera Training Center Breda The Netherlands



grass valley

A **BELDEN** BRAND

Jan Paul Campman

- ▢ Training Manager
- ▢ Trainer
- ▢ Acceptance Engineer
- ▢ Demo specialist
- ▢ Web master

- your guide for this INTERACTIVE session.
- **Welcome to the LDX WEB-Training**



Functional LDX series

- ✦ GV Cameras developed several new products
- ✦ This part gives you some more details about the Basics and Functions within the LDX product line

In this session:

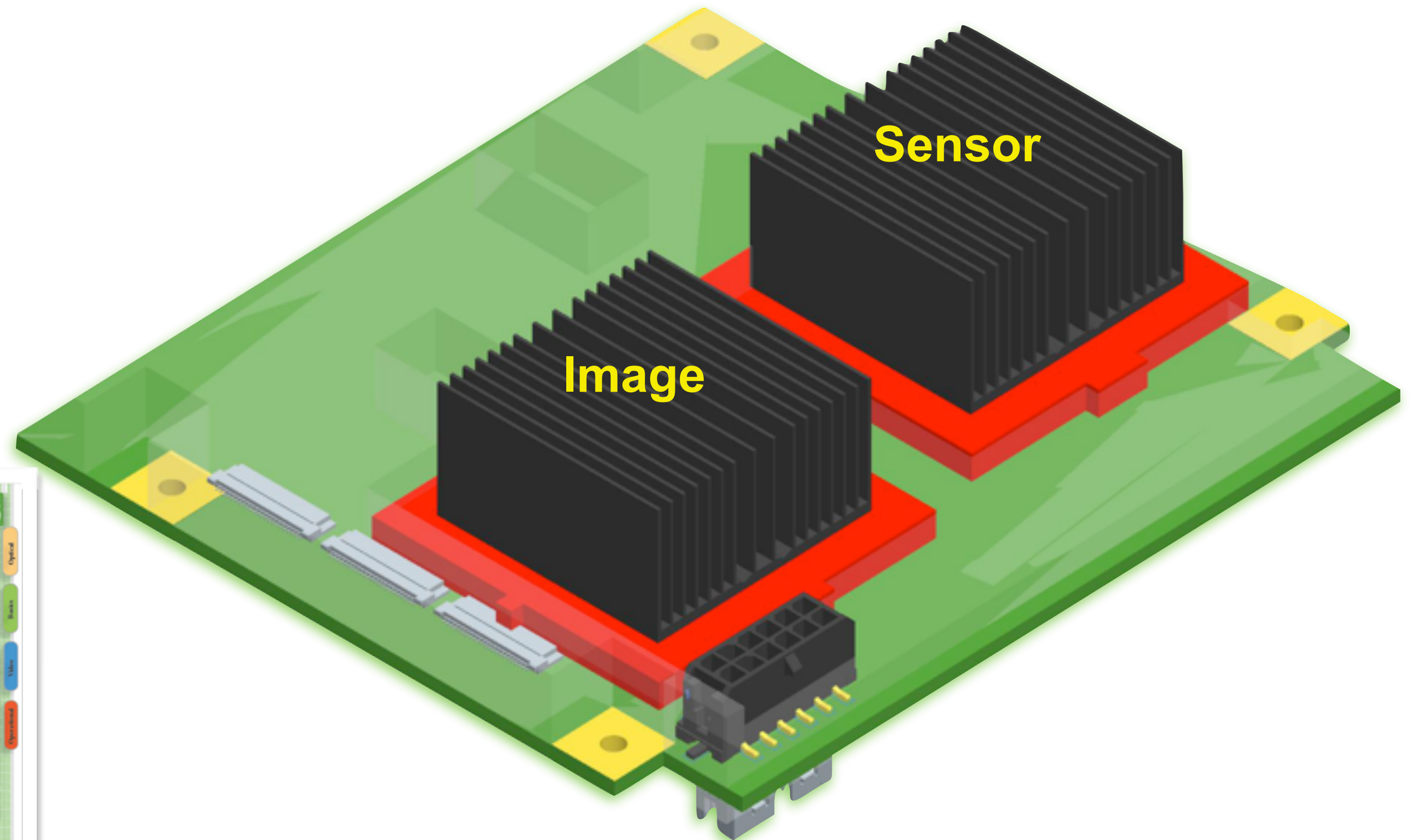
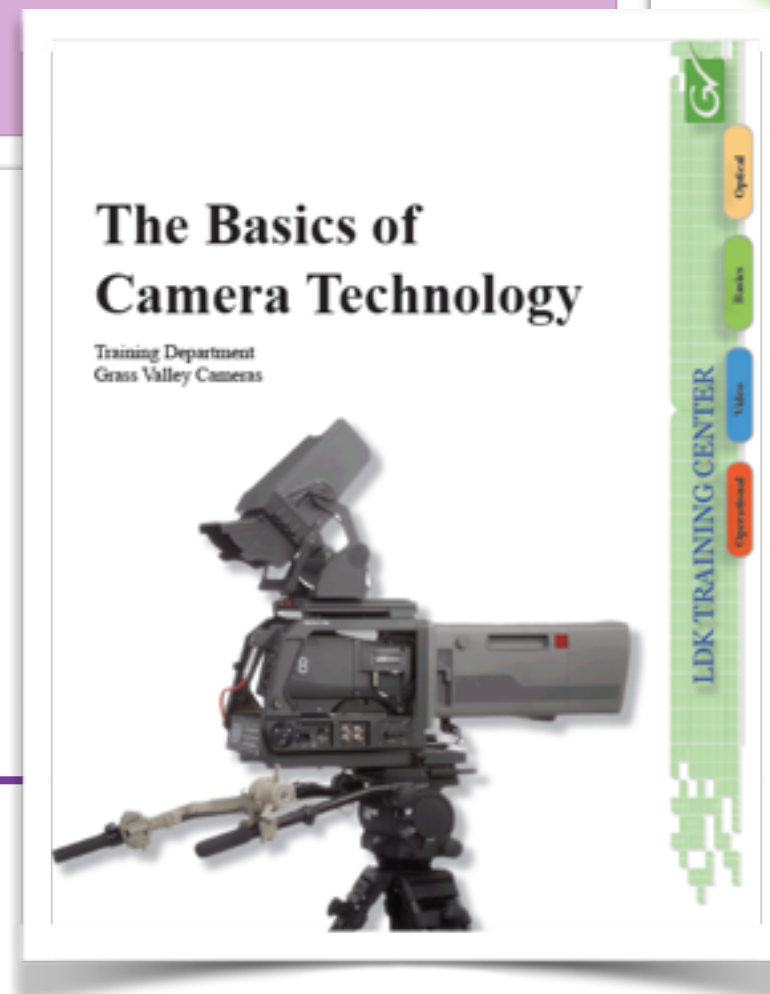
- ✦ **Basics Video / Image processing**
- ✦ Generic controls
- ✦ Connections and Controls
- ✦ Scenefile handling (Card and USB)
- ✦ ArtTouch Menu (LDX)
- ✦ Menu Basics - Camera / XCU
 - ✦ - OCP400
 - ✦ - Viewfinder
- ✦ Network C²IP



Functional LDX series

- **Basics Video / Image processing**

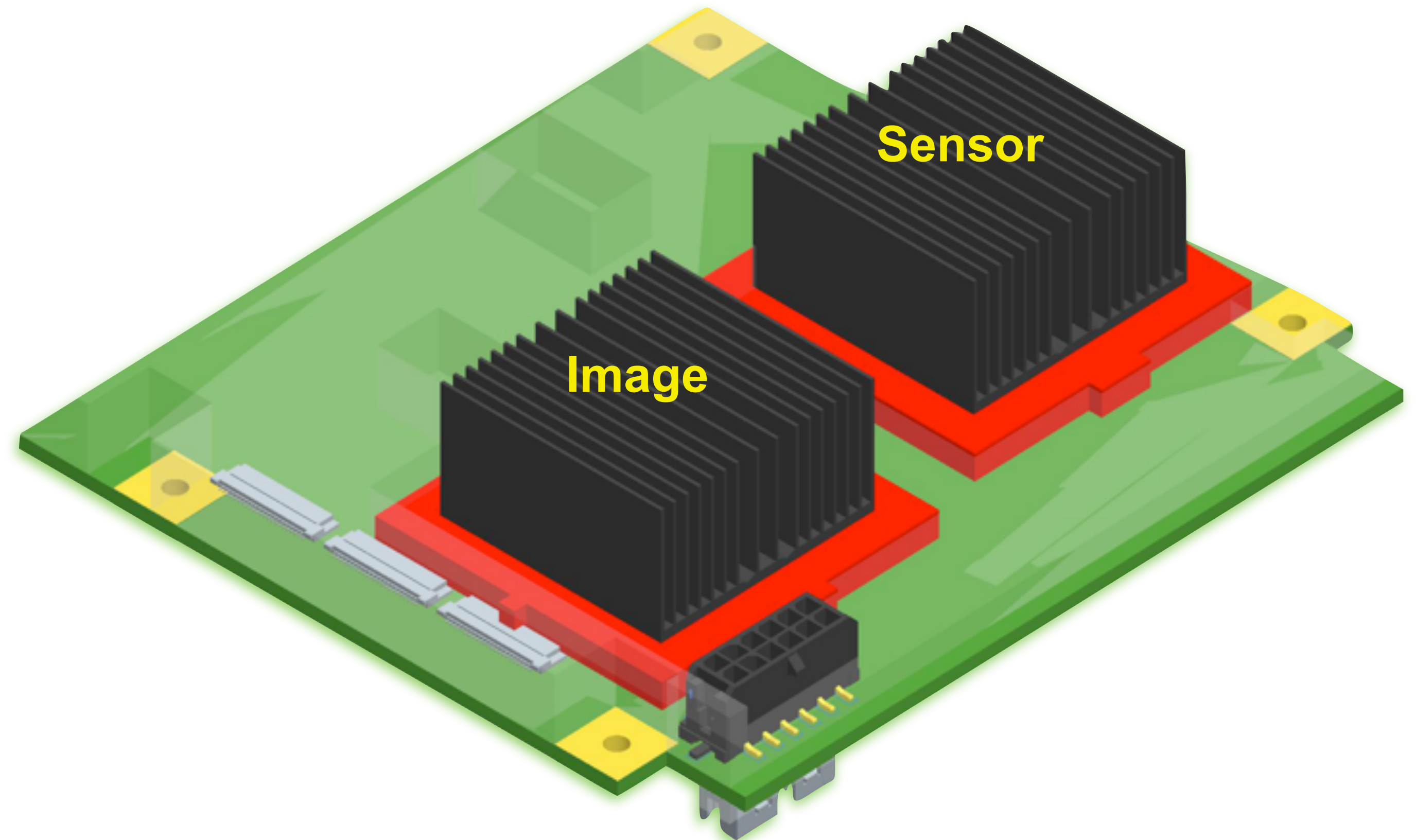
- ✦ The following slides are about the basic Video parameter.
- ✦ Basic camera experience is mandatory in order to follow the training sessions.
- ✦ For more details.
Use Basics Camera Training



Functional LDX series

- **Basics Video / Image processing**

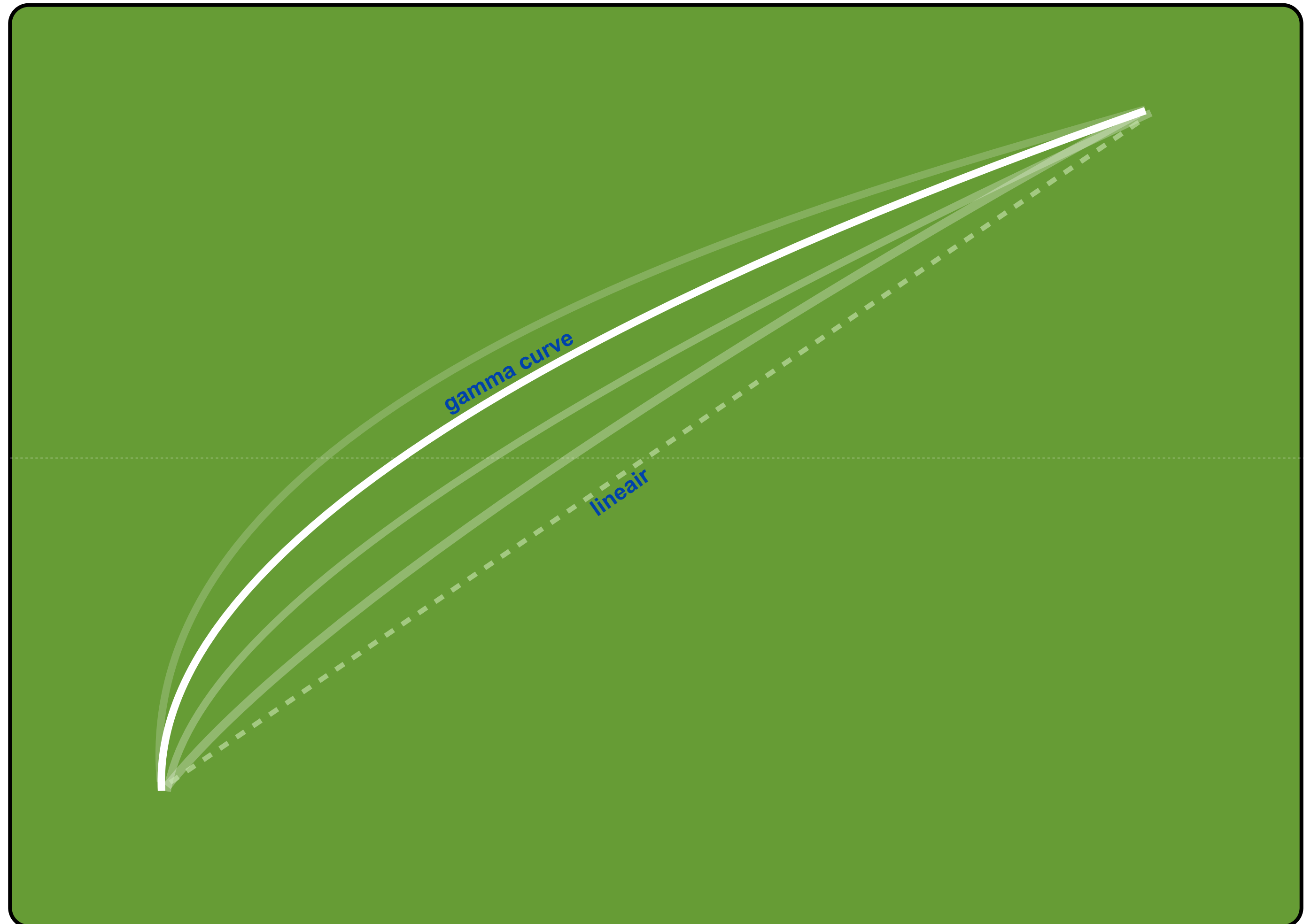
- ◆ Gamma
- ◆ Knee
- ◆ Black Stretch
- ◆ Detail
- ◆ Color correction
- ◆ Flare
- ◆ White Shading
- ◆ Matrix
- ◆ RGB to Y/R-Y/B-Y



Functional LDX series

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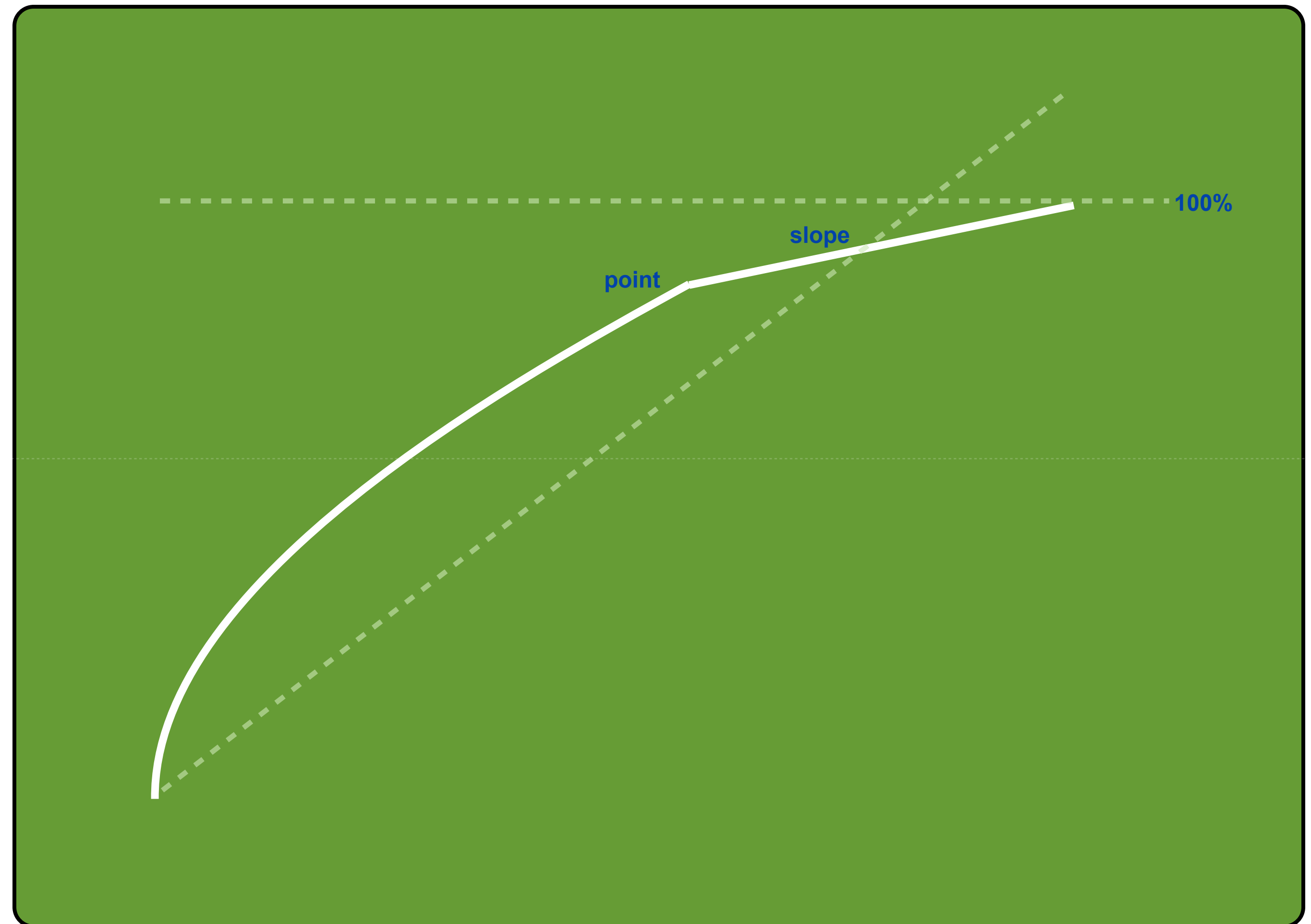
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- ◆ **Detail**
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- ◆ **RGB to Y/R-Y/B-Y**



Functional LDX series

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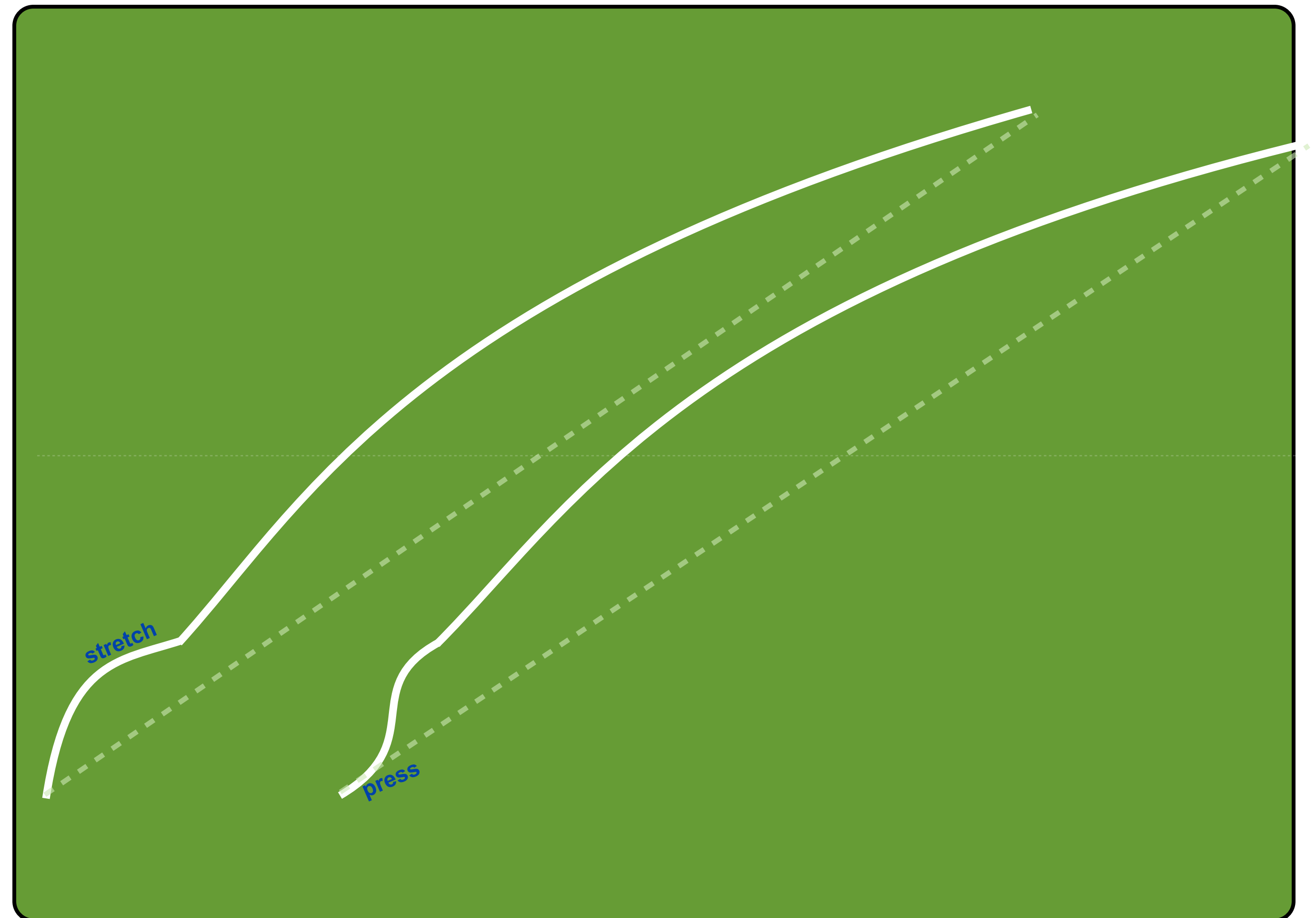
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Functional LDX series

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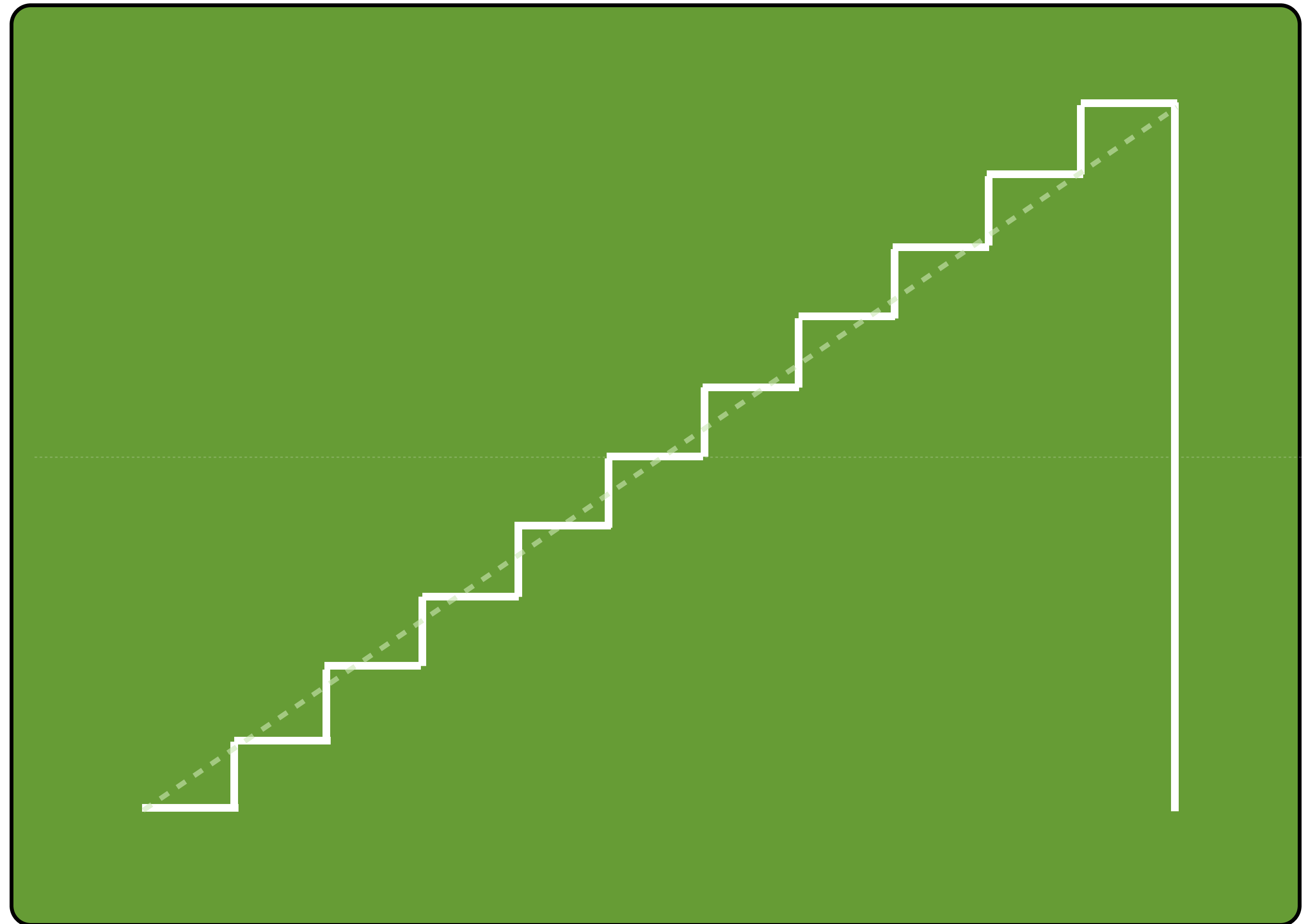
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- ◆ **Black Stretch**
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Functional LDX series

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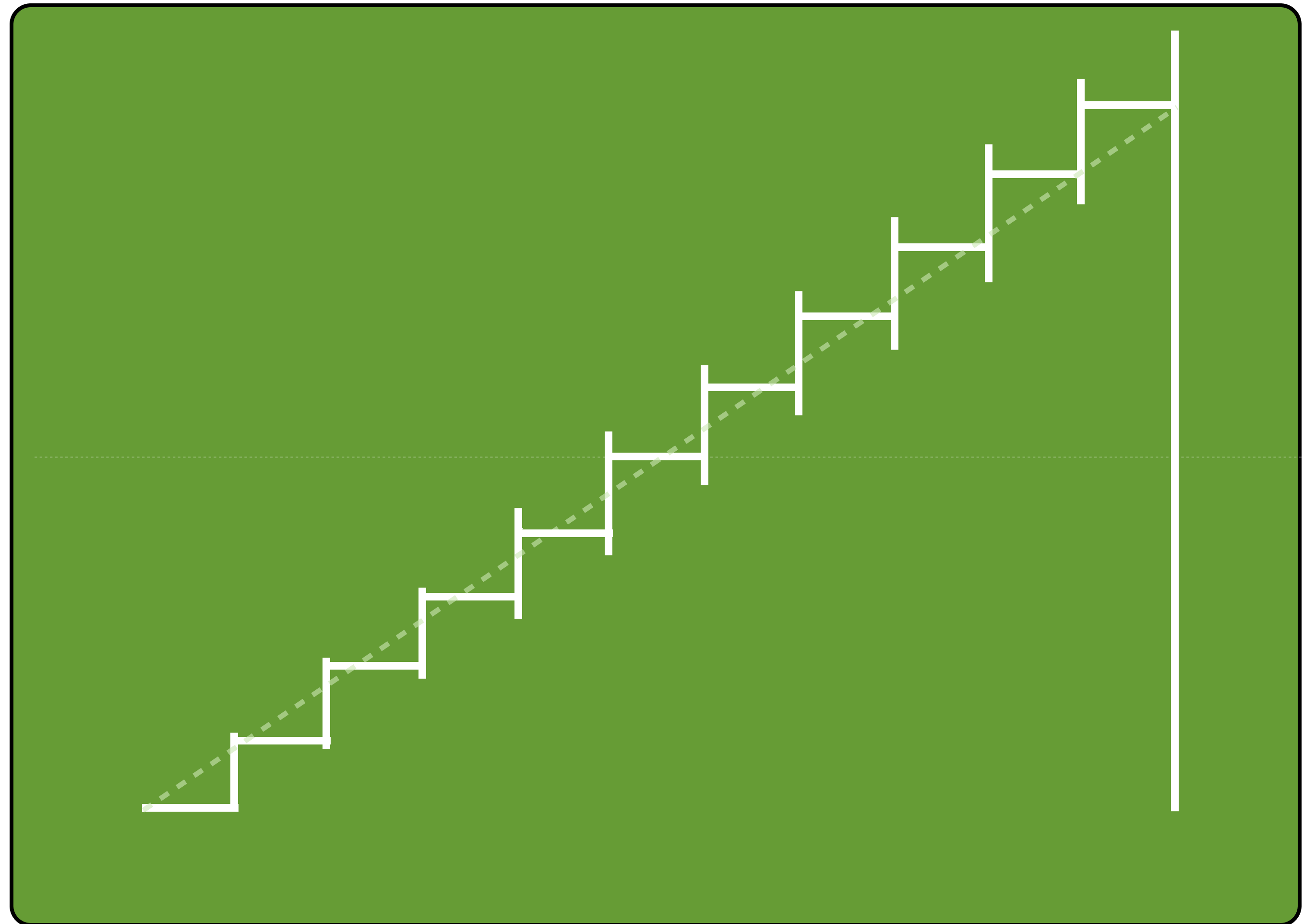
- ◆ Gamma
- ◆ Knee
- ◆ Black Stretch
- ◆ **Detail Off**
- ◆ Color correction
- ◆ Flare
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Functional LDX series

- **Basics Video / Image processing**

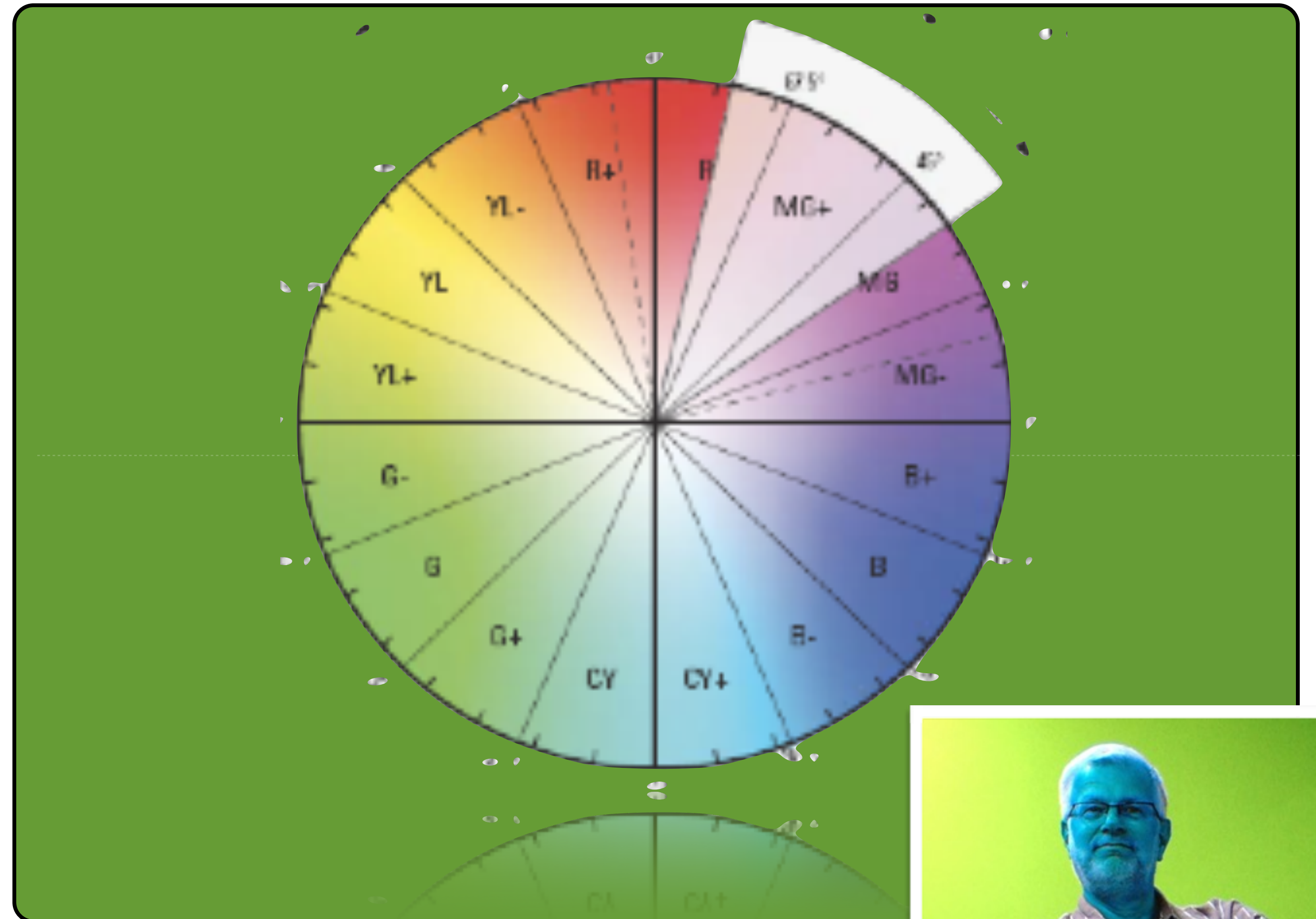
- ◆ Gamma
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Functional LDX series

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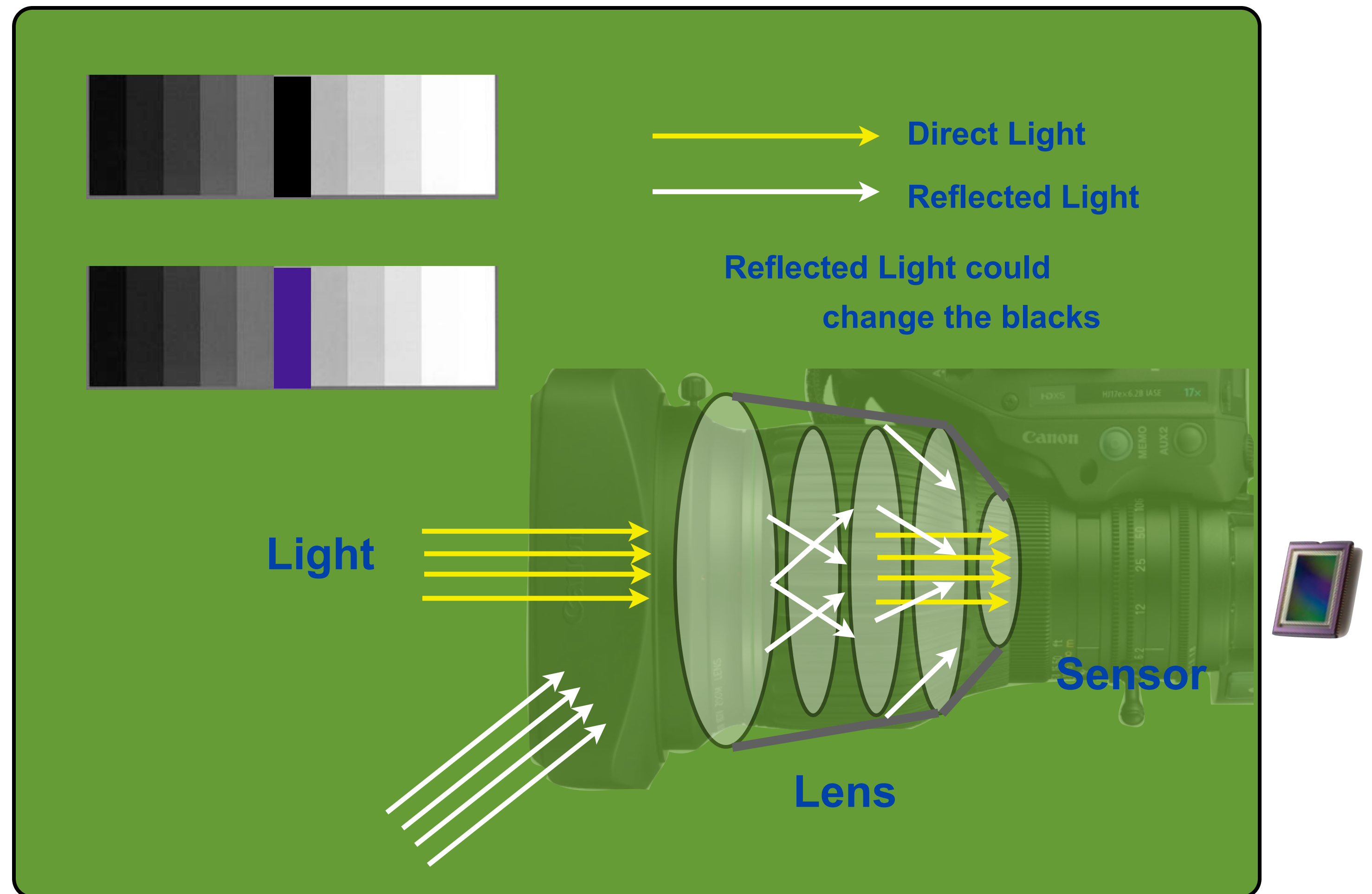
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Functional LDX series

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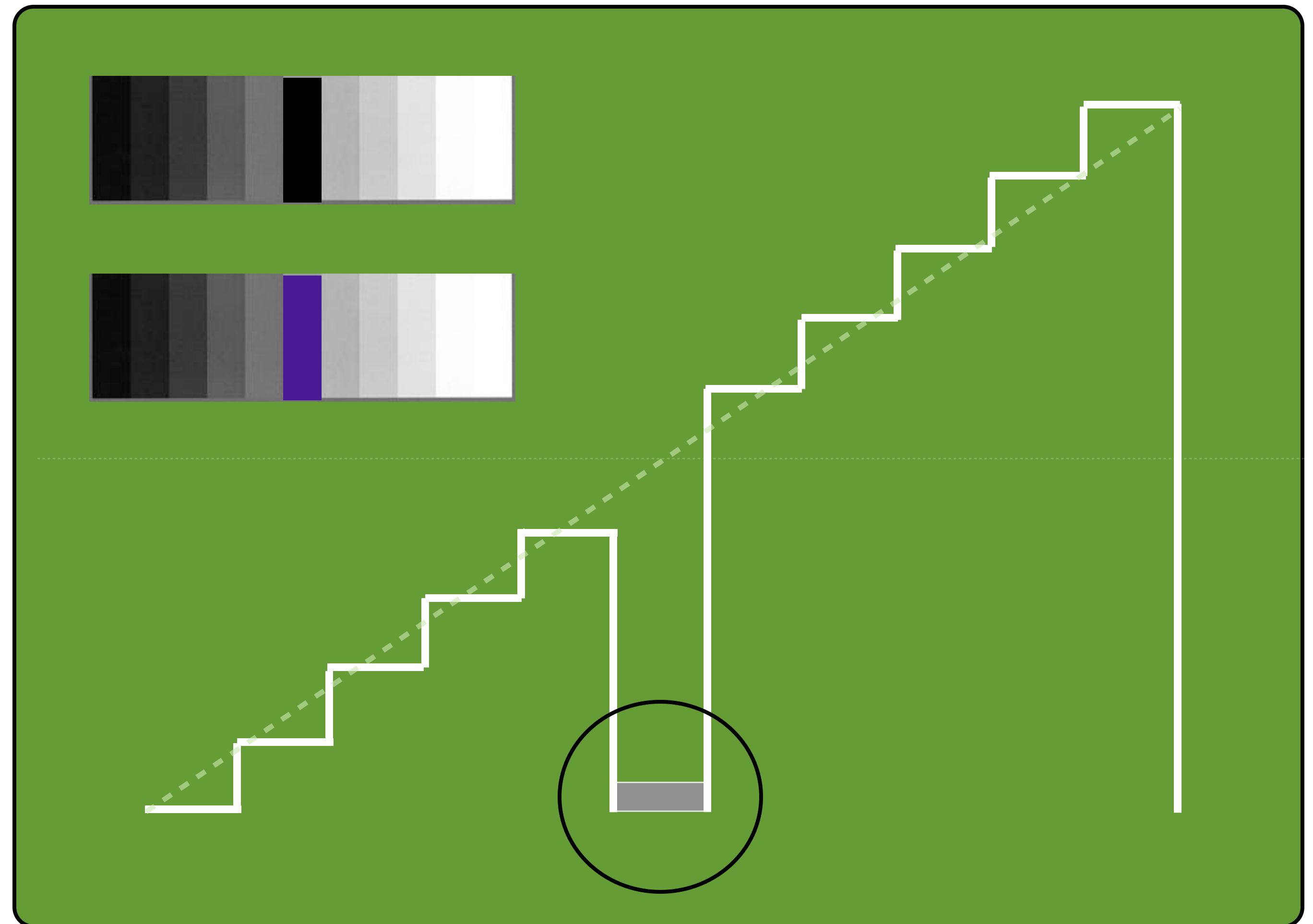
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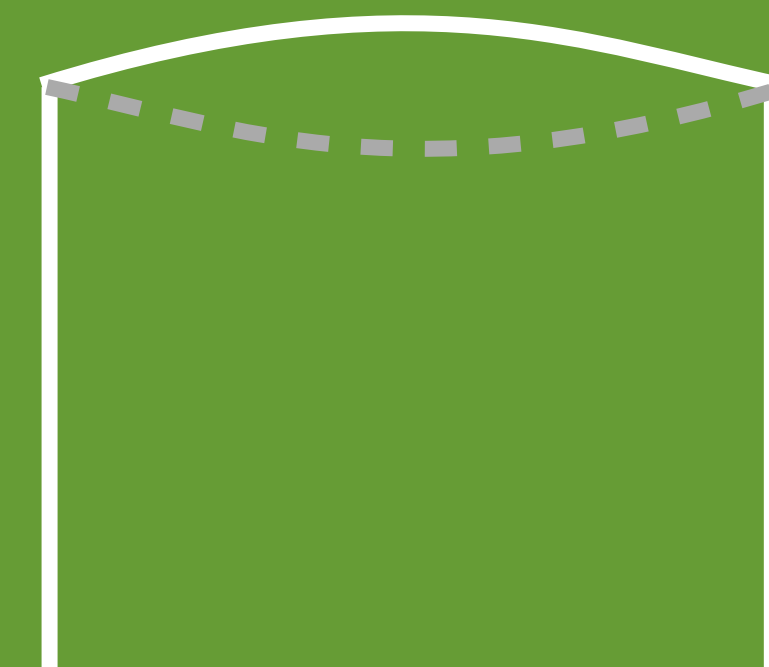
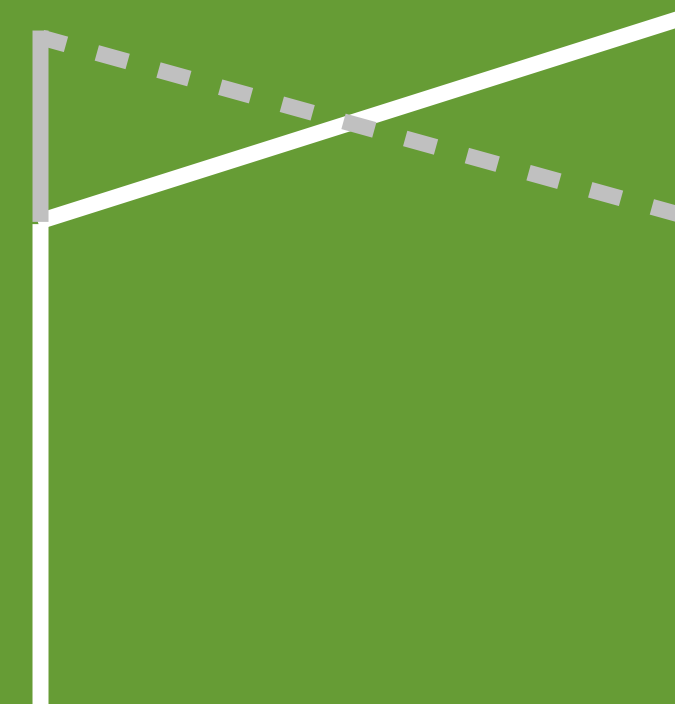
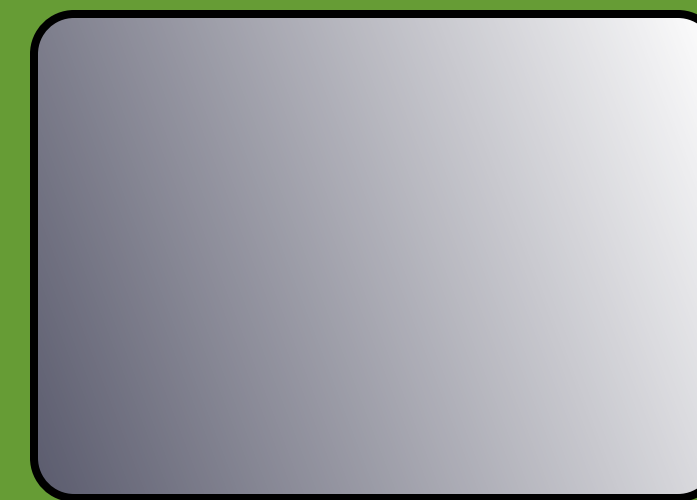


Functional LDX series

- **Basics Video / Image processing**

- ◆ Gamma
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Errors in Lens could disturb the white linearity



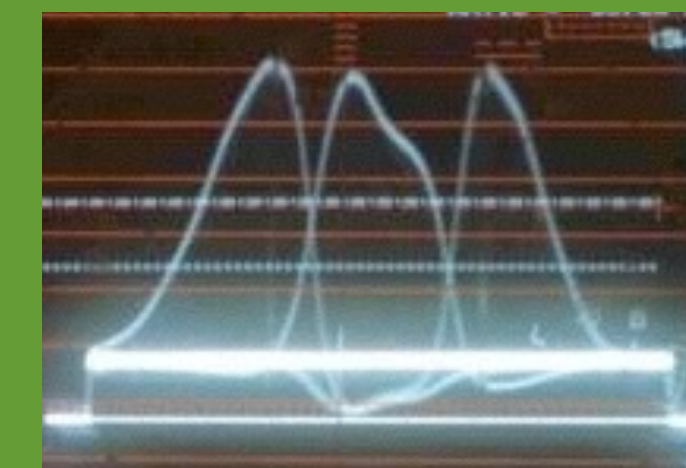
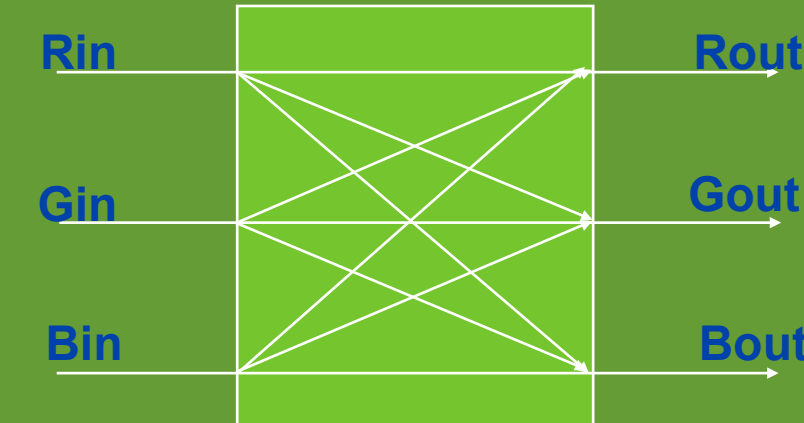
Functional LDX series

- **Basics Video / Image processing**

- ◆ **Gamma**
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- ◆ **Flare**
- ◆ **White Shading**
- ◆ **Matrix**
- ◆ **RGB to Y/R-Y/B-Y**



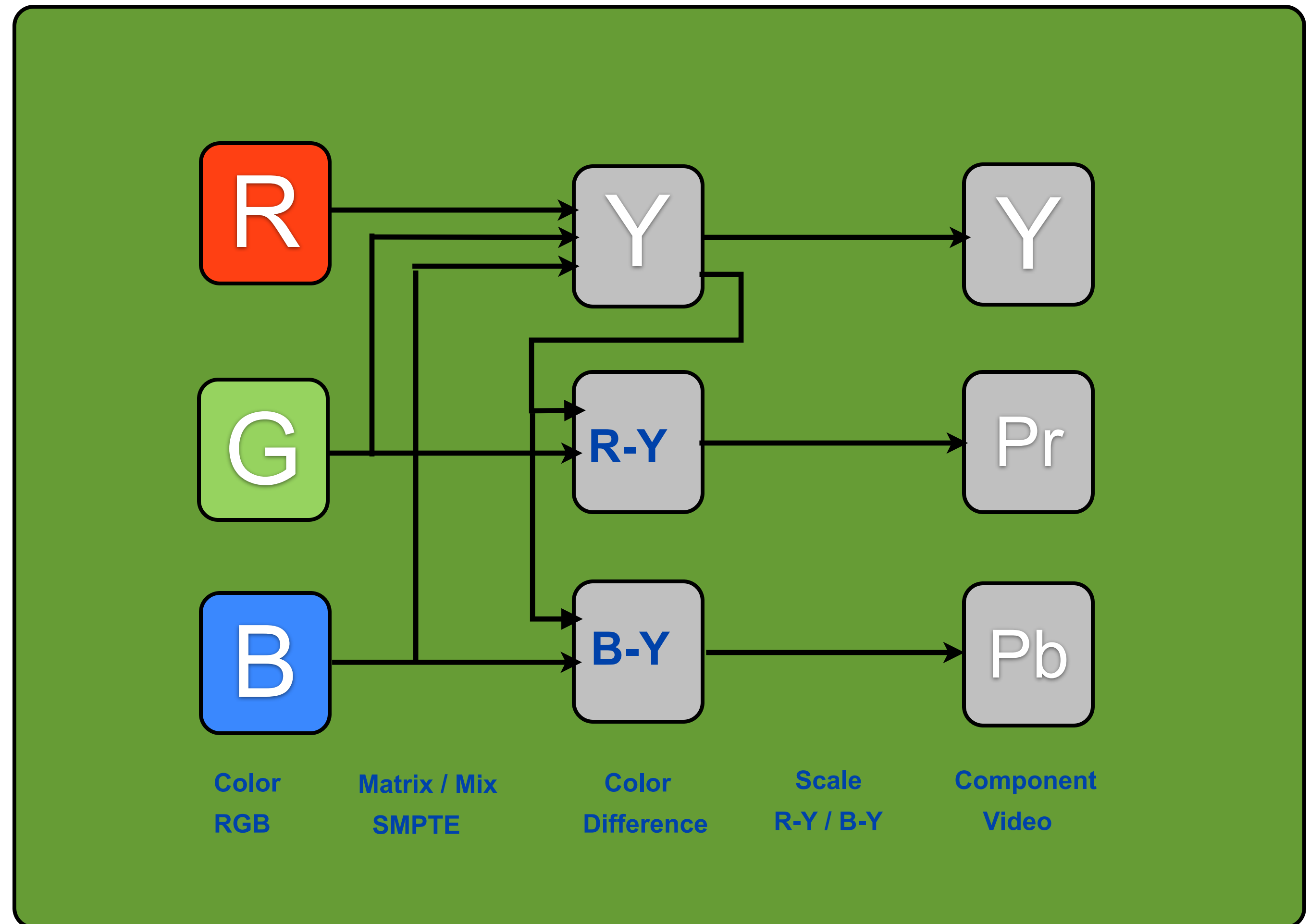
- **Correct the optical color splitter (prism)**
- **Obtain specific color reproduction**
(standardization, artistic)



Functional LDX series

- Basics Video / Image processing

- ◆ Gamma
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- ◆ Black Stretch
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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)



Functional LDX series

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In this session:

- ✦ Basics Video / Image processing
- ✦ **Generic controls**
- ✦ Connections and Controls
- ✦ Scenefile handling (Card and USB)
- ✦ ArtTouch Menu (LDX)
- ✦ Menu Basics - Camera / XCU
 - ✦ - OCP400
 - ✦ - Viewfinder
- ✦ Network C²IP



Generic Operational Controls

What is the purpose of video processing?

- In optical and in video processing many parameters can to be adjusted

- ◆ Iris: open or close (F1.4 .. F22)
- ◆ Neutral density filters 1, 1/4, 1/16, 1/64
- ◆ Gains: low or to high (-6dB .. +30dB)
- ◆ Balance (digital) Color temperature (2000k .. 20000k)
- ◆ More or less Sharpness (Detail)
- ◆ Black level: up or down
- ◆ Knee: reconstruct overexposure (100% .. 800%)

Before processing



After processing



- Eventually everything must fit in the HD standard and produce a 5600k picture on a monitor

Generic Operational Controls

- ◆ **Before processing:**

Video is like a wheelbarrow full of wild **RGB** frogs



Generic Operational Controls

◆ After processing:

All frogs are uniformly packed and adjusted to our needs



RGB frog

R B frog

Green frog

Skin detect frog

Yellow frog

Generic Operational Controls

The “Generic” Controls are the most frequently used by the Shader:

- ✦ Lens Iris
- ✦ Optical ND filters
- ✦ Master-gain
- ✦ RGB-gain

To compensate for imperfections in the optical path:

- ✦ Masterblack
- ✦ RGB-black
- ✦ Flare

Iris, Masterblack, RGB-gain, RGB-black
at dominant position on the OCP.

Generic
Operational
Controls



Generic Operational Controls

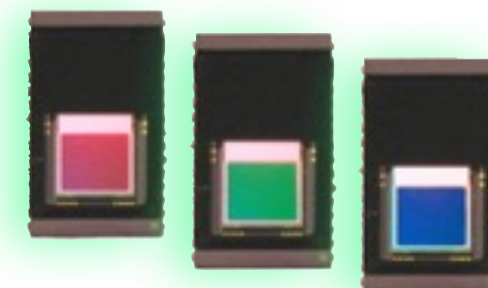
Where are the “Generic” Controls located?

- Front
 - Lens Iris
 - Optical ND filters
- Video processor
 - Master-gain
 - RGB-gain
 - Masterblack
 - RGB-blacks
 - Flare

In the Camera (Head)!



Front (8000)



Pre-
process
Analog

Processing (8000)



Analog to
Digital
14bit

R/G/B

Digital
process
>20bit

R/G/B




Digital
Output
10 bit C
10 bit Y

Y/Cr/Cb

Generic Operational Controls

Where are the “Generic” Controls controlled?

■ GAIN and COLOR Temperature parameters

			
	Camera sw. panel User level 2,3	Menu Camera User level 2,3	OCP or MCP
GAIN	-, +, ++, ++,+++	MenuVideo - to +++ MenuSetup (Preset)	-, +, ++, ++,+++
VAR GAIN (+/- 1dB)	-6 to + 12dB	-6 to + 12dB	-6 to + 12dB
COL TEMP	AW1 - AW2- AWC 3200K-5600K-7500K	AW1 - AW2- AWC 3200K-5600K-7500K	AW1 - AW2- AWC 3200K-5600K-7500K
VAR COL TEMP	2200K - 20000K		2200K - 20000K
COL BALANCE		MenuSetup (Range)	3dB or 6dB
Filter wheel	Left switch panel	Menu filterwheel	FilterWheel OCP/MCP

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- ✦ **Connections and Controls**
- ✦ Scenefile handling (Card and USB)
- ✦ ArtTouch Menu (LDX)
- ✦ Menu Basics - Camera / XCU
 - ✦ - OCP400
 - ✦ - Viewfinder
- ✦ Network C²IP

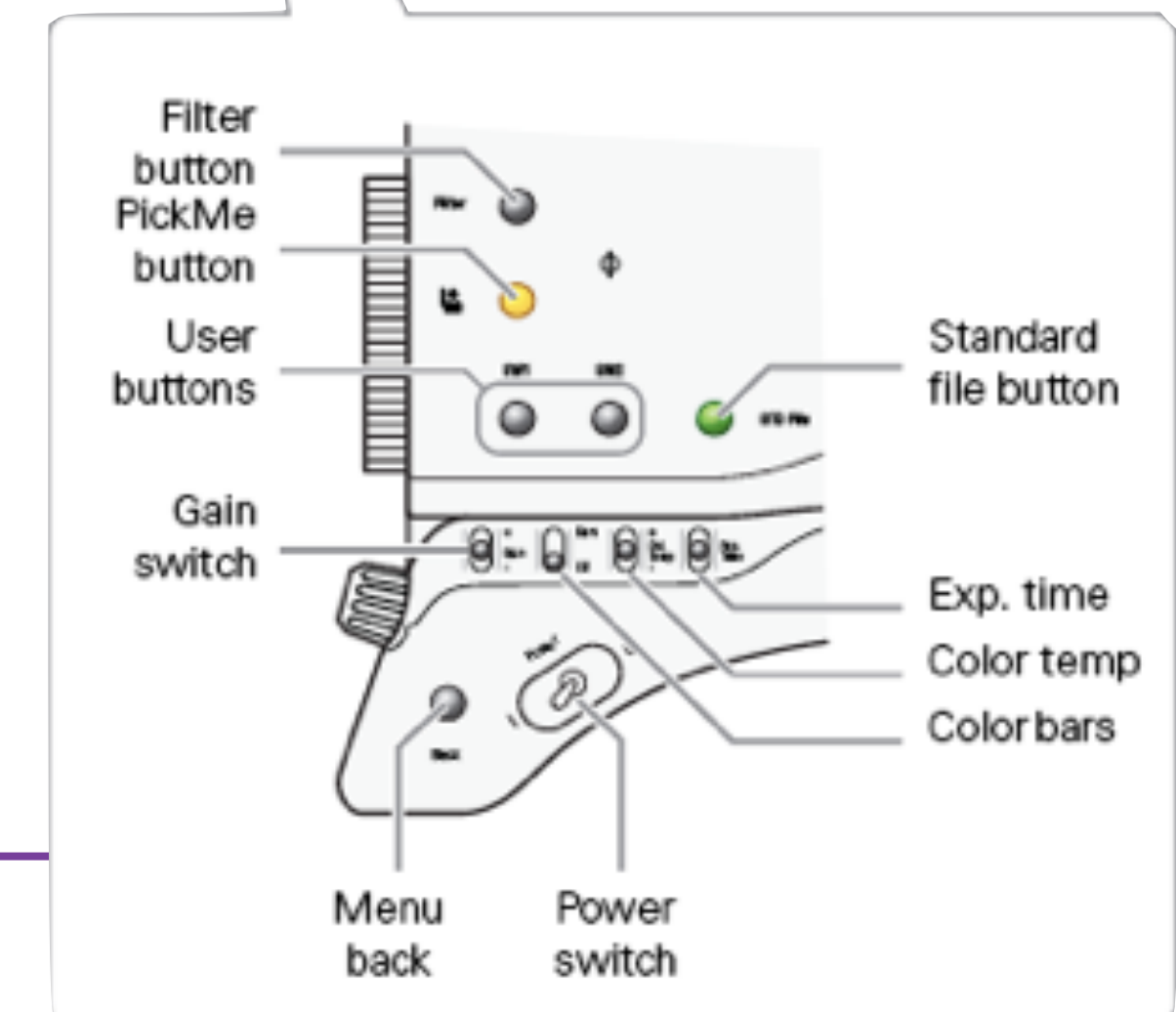
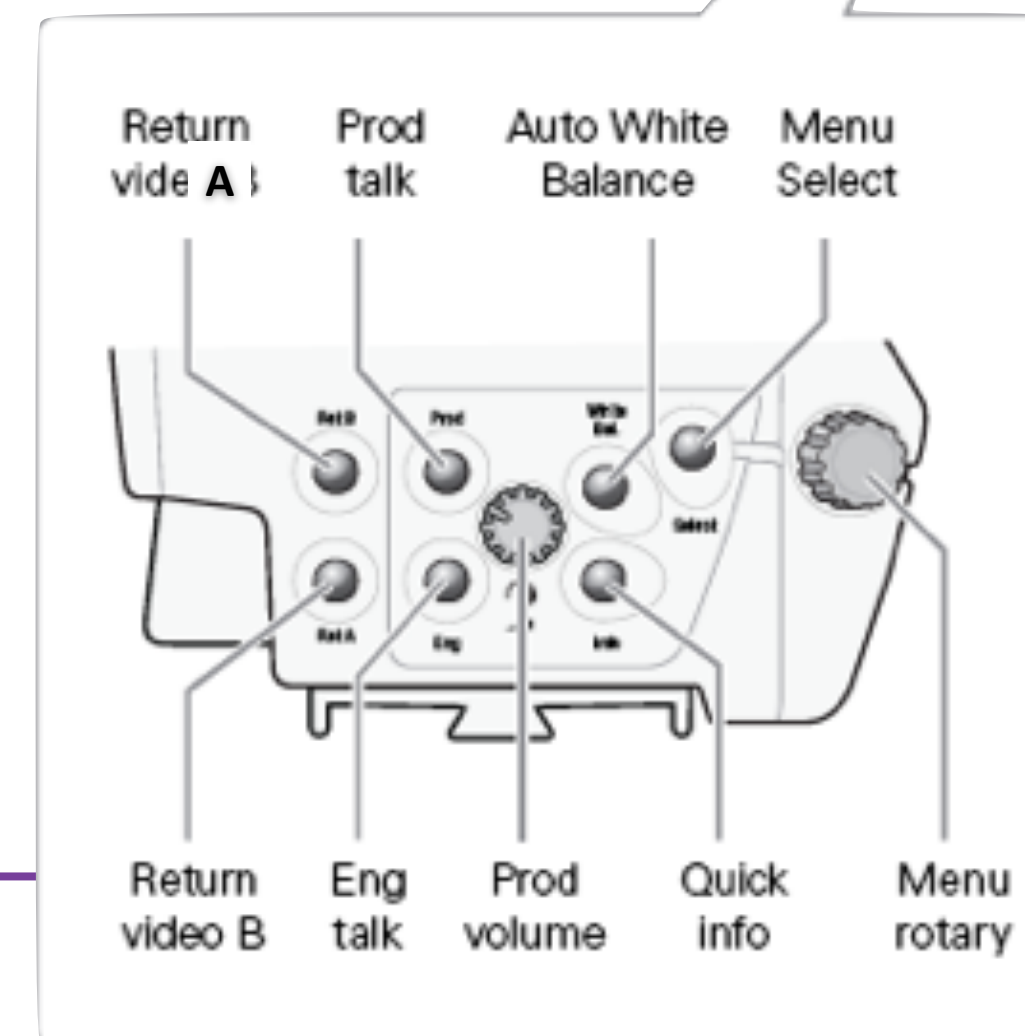
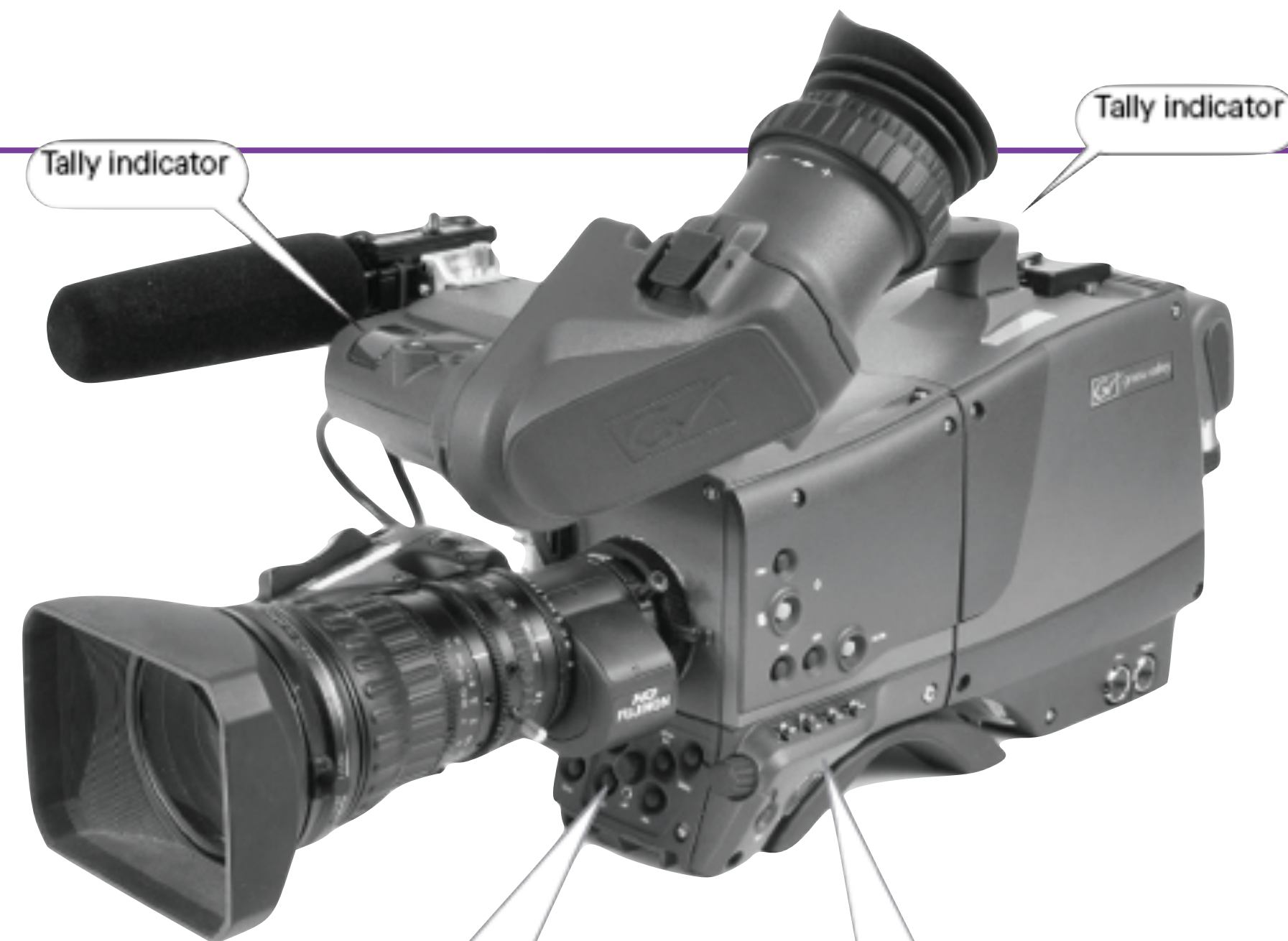


Introduction LDX series

The LDX series Camera

New Button layout

- ◆ Rotary Menu knob + Return button
- ◆ Quick info button (On screen)
- ◆ Return A,B buttons
- ◆ Filter wheel control
- ◆ PickMe button
- ◆ Power button (deeper mounted)

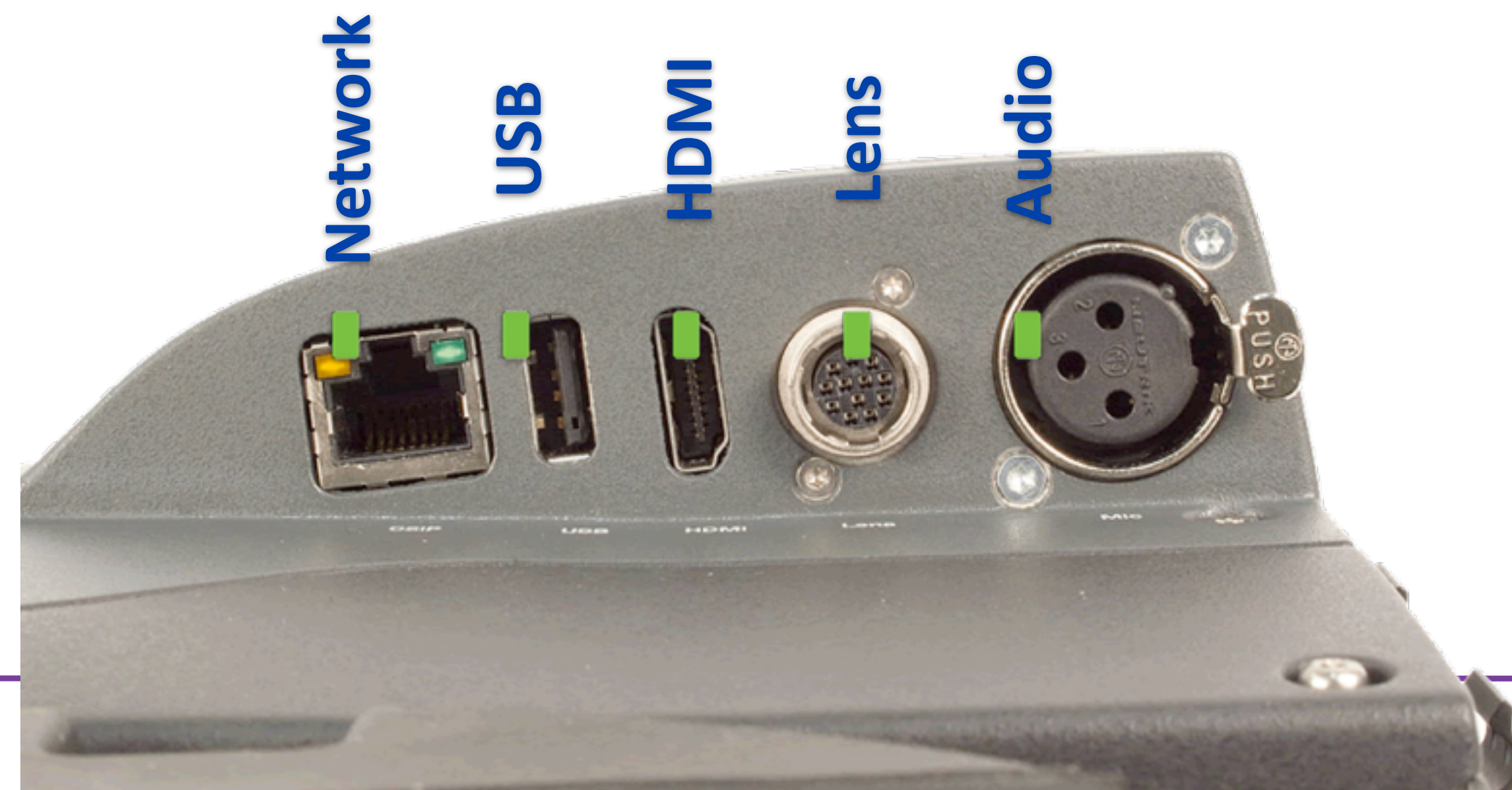


Introduction LDX series

The LDX series Camera

New Connector layout

- ◆ **Network** (Connection to OCP, Downloading package)
- ◆ **USB**
Store/ Recall Scene, Operational, Lens files & Diagnostics
- ◆ **HDMI** (HD + VF text output)
- ◆ **Lens**
- ◆ **Audio**
- ◆ **VF connector on top**



Introduction LDX series

The LDX series Camera



New **LDX** Menu structure

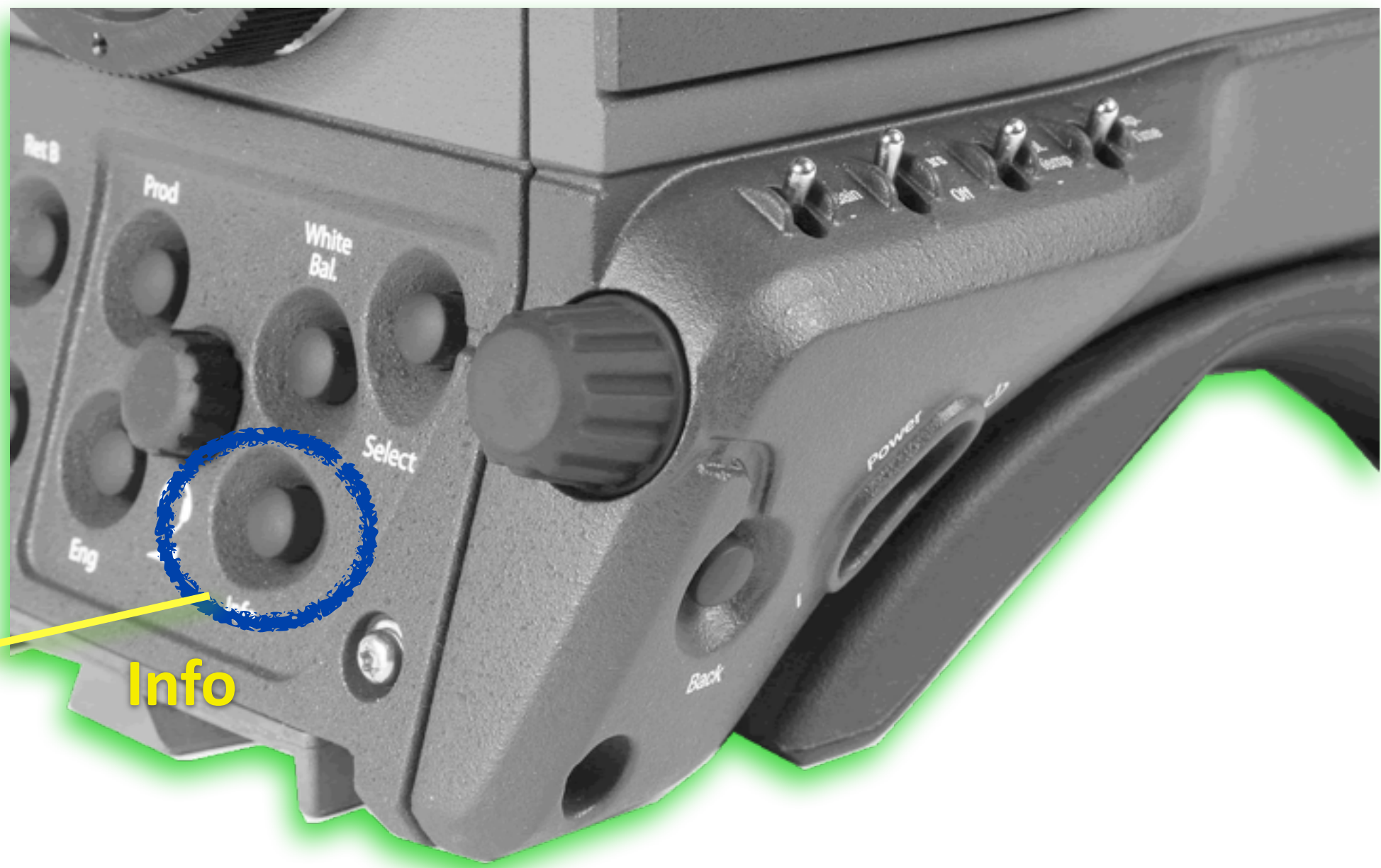
Introduction LDX series

part 1 Introduction

The LDX series Camera



CAM 01	SW1	EXT1
	SW2	EXT2
1080i50	HGrip	PROD
0.0dB	Ret A	EXT1
ND Clear	Ret B	EXT2
FX Clear	VTR L	PROD
CTemp 3200K	RET L	EXT
Gamma Nom		
MBLK 50		
TCam 32C	ULvL	User 3
TPwr 57C	OpFL	OCam1
	STDper	Fact



New LDX Info button

Introduction LDX series

The LDX series **Camera 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

- Locations of the functions

To control all functions inside the **Camera** system there are several options.

- ✦ Camera Menu (Viewfinder)
- ✦ OCP / MCP control



Menu Controls Camera/**XCU**/VF

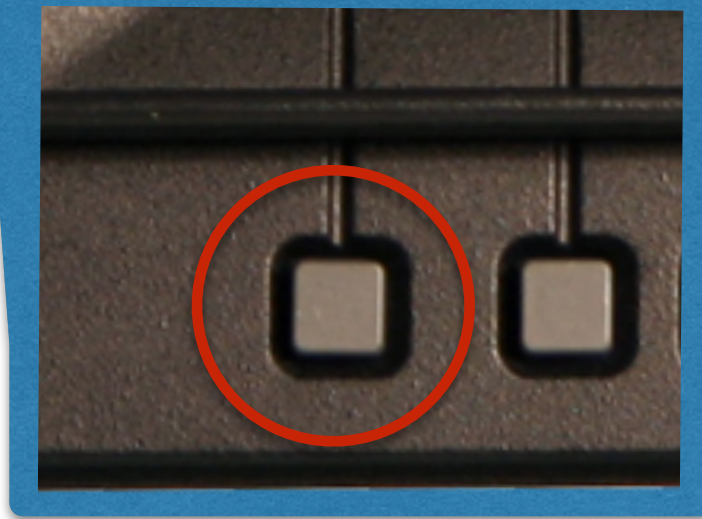
■ Locations of the functions

To control all functions inside the
XCU you have the following option.

- ◆ Basestation Menu (HD Mon. out)
- ◆ OCP XCU menu (HD Mon. out)



Menu Controls Camera/XCU/VF


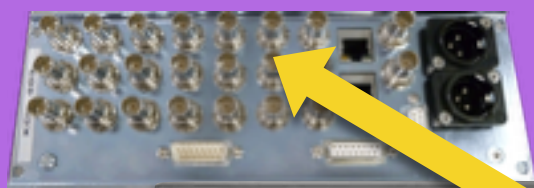

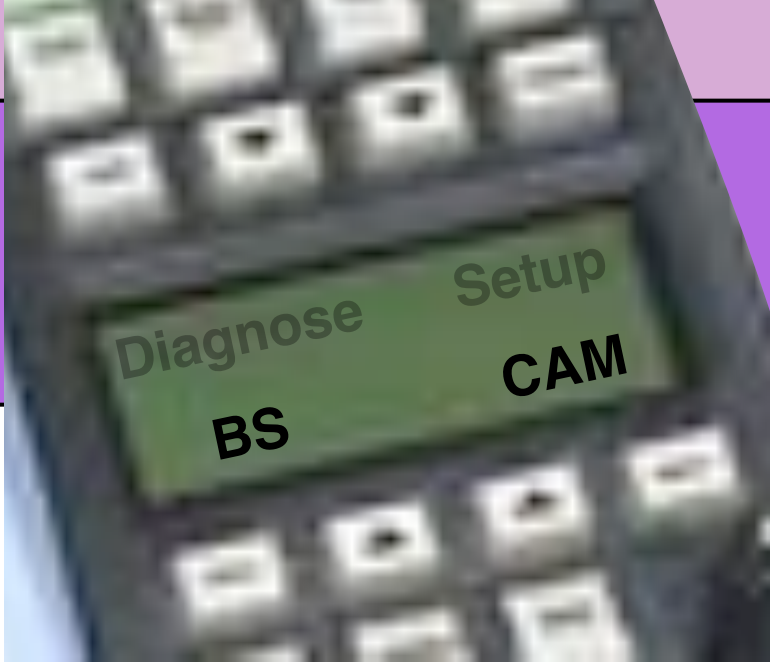


Menus

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

- Settings Camera
- Settings XCU
- Settings Viewfinder
- Install
- Diagnostics

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

Adaptors Fiber and Triax

3G & 10G Adaptor for LDX only

- Triax (**Green**) - LDX 5640
- Fiber (**Blue**) - LDX 5650
- Fiber (**Yellow**) - LDX 5660
- New docking connector type used for LDX
- New mounting method for LDX

With LDX

- **3G** is Third Generation Transmission

- | | |
|-------------------------|-----------|
| 1: Analog RGB | 1990-2000 |
| 2: Analog component | 2000-2013 |
| 3: Digital Transmission | 2013- now |

With LDX

- 3G is Third Generation Transmission

4,5 G fiber for 1080i or 1080p
3 speed LDK8300

With LDX 86

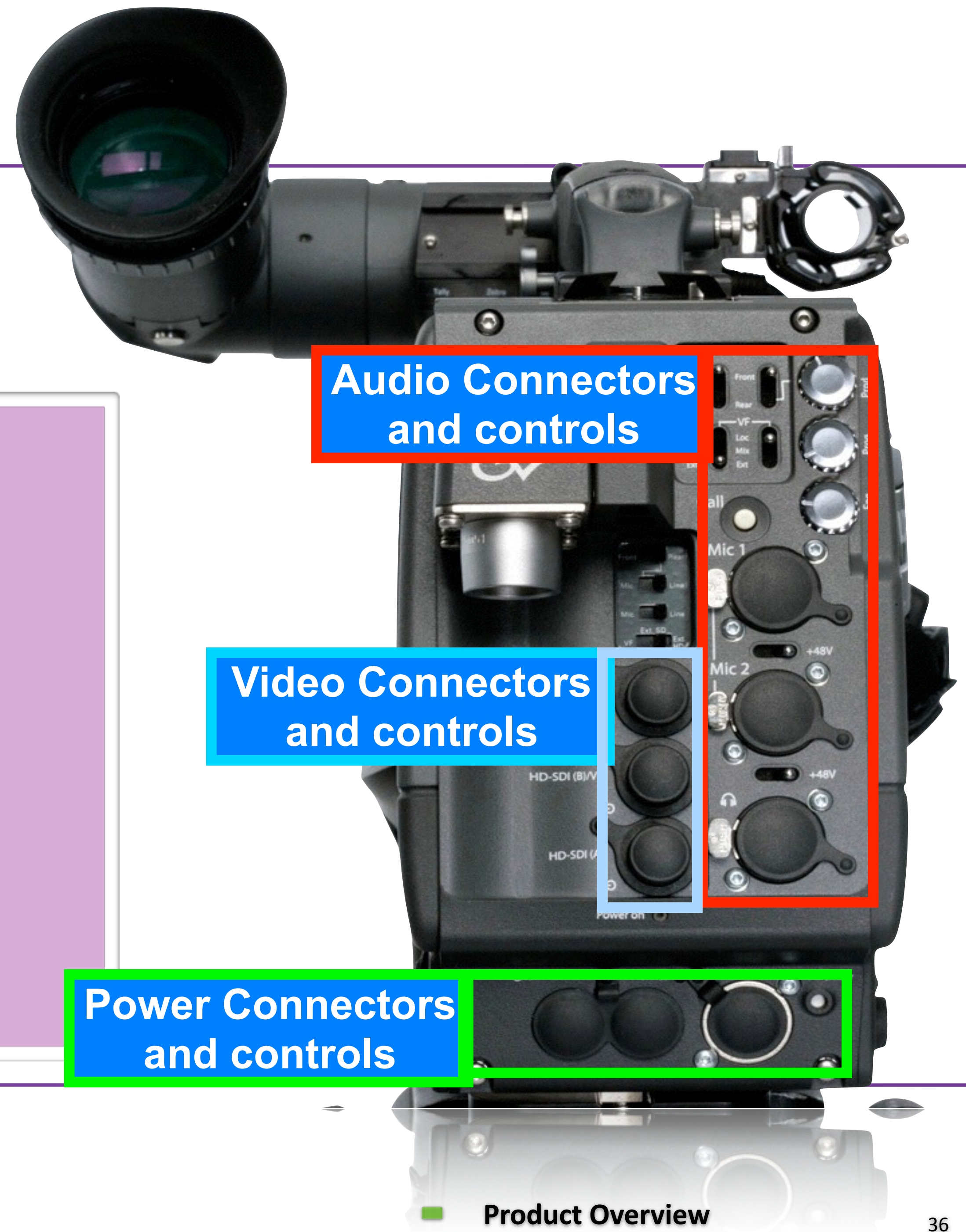
- **10G** XF adaptor
- 1: for 1 , 3 , 6 speed
- 2: for 4K
- 3: for XDR



3G adaptors Fiber and Triax

3G Adaptor

- Audio
XLR Audio channel 1, 2 / AES Audio channel 3, 4
- Video
BNC for HDSDI live or live+VF and Ext, analog TP out
- Power
Scriptboard, power TP unit (+ ON air pin)
- Controls
Ext/Y mix, Intercom select ENG/Prod. Fantom power



10G adaptors Fiber

10G Adaptor

- Audio
XLR Audio channel 1, 2 / AES Audio channel 3, 4
- Video
BNC for HDSDI live or live+VF and Ext, analog TP out
- Power
Scriptboard, power TP unit (+ ON air pin)
- Controls
Ext/Y mix, Intercom select ENG/Prod. Phantom power

Audio Connectors
and controls

Video Connectors
and controls

Power Connectors
and controls

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- ✦ Connections and Controls
- ✦ **Scenefile handling**
- ✦ ArtTouch Menu (LDX)
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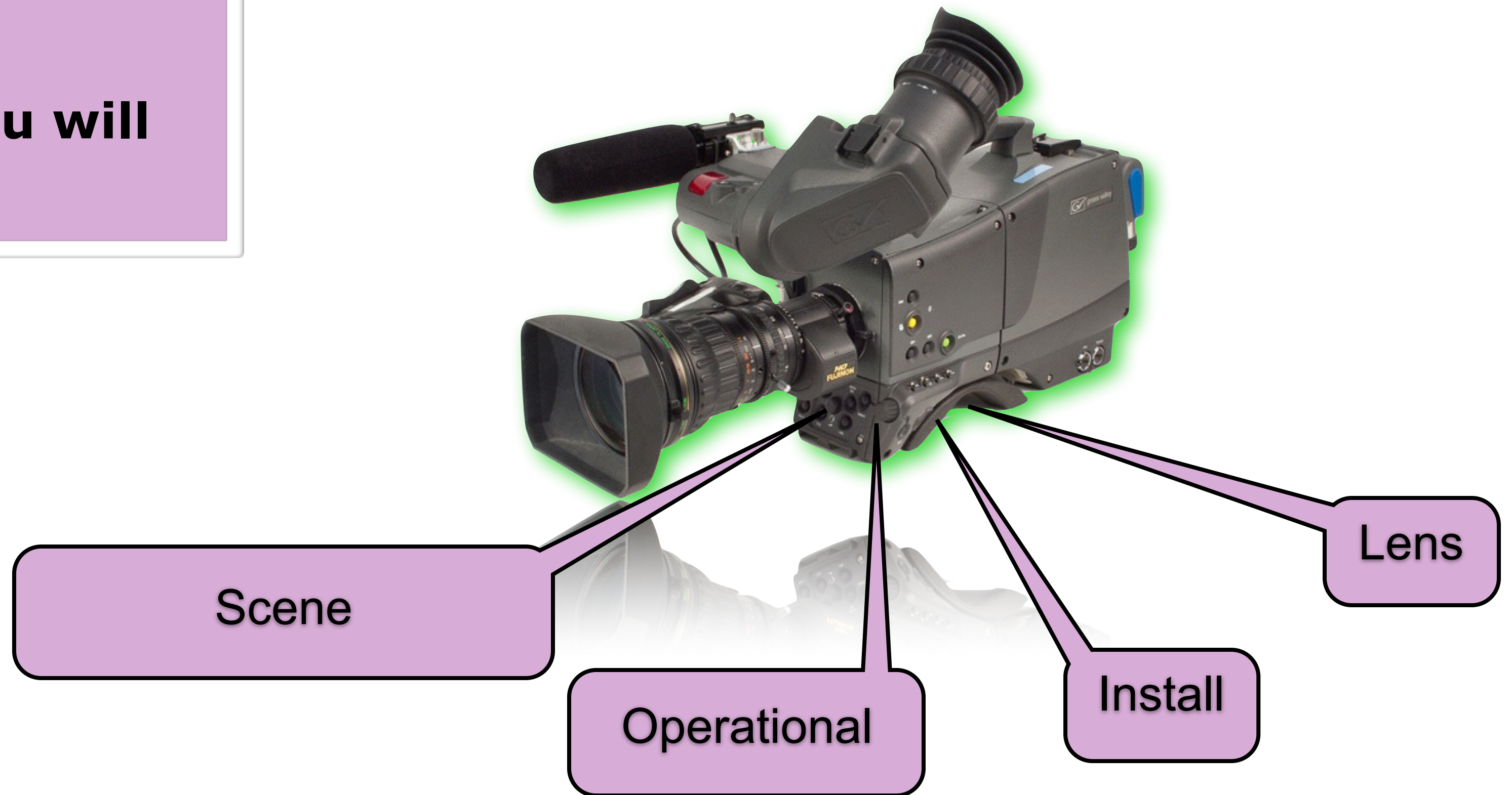


Scenefile handling

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.

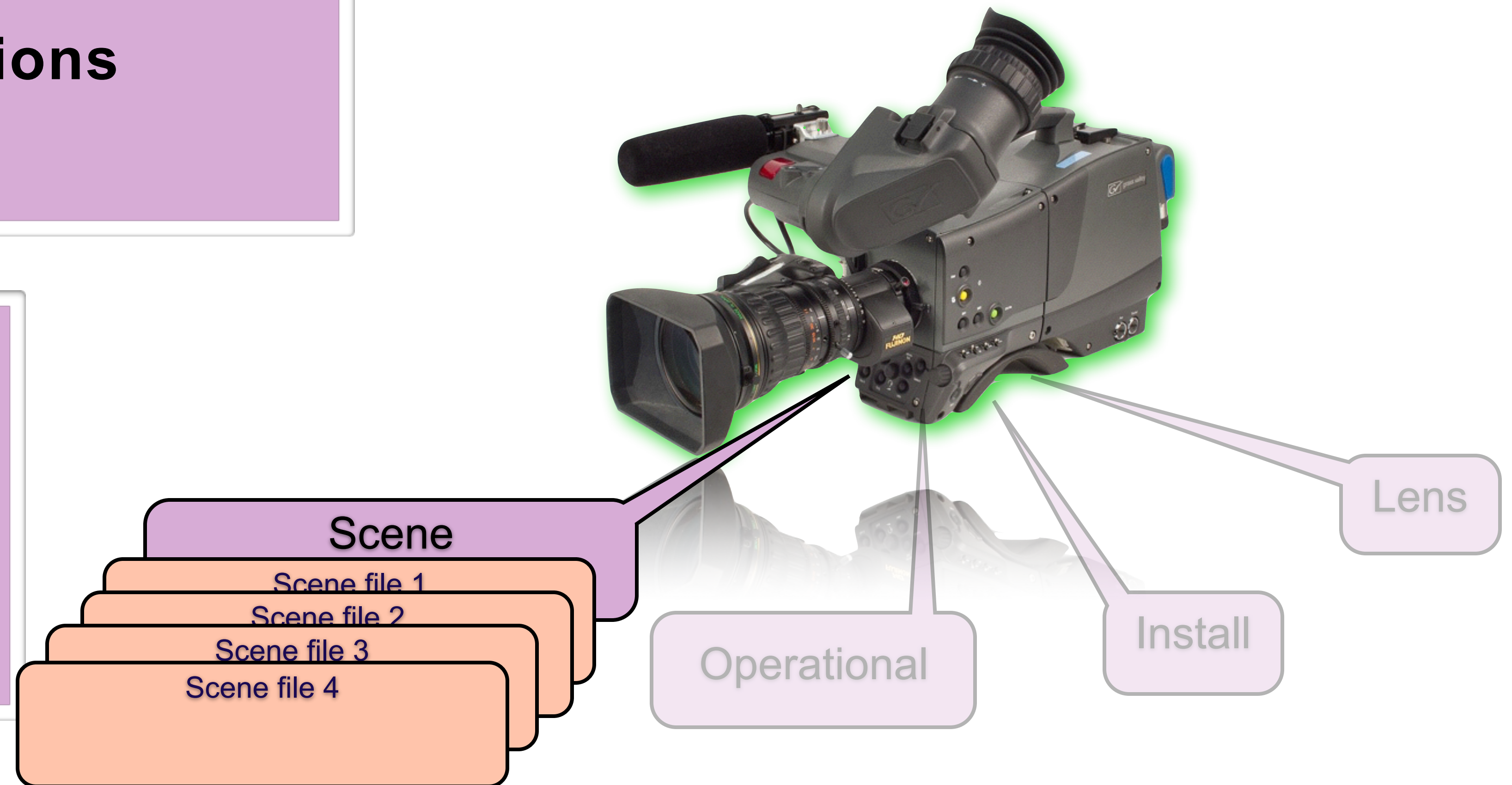
Scenefile handling

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

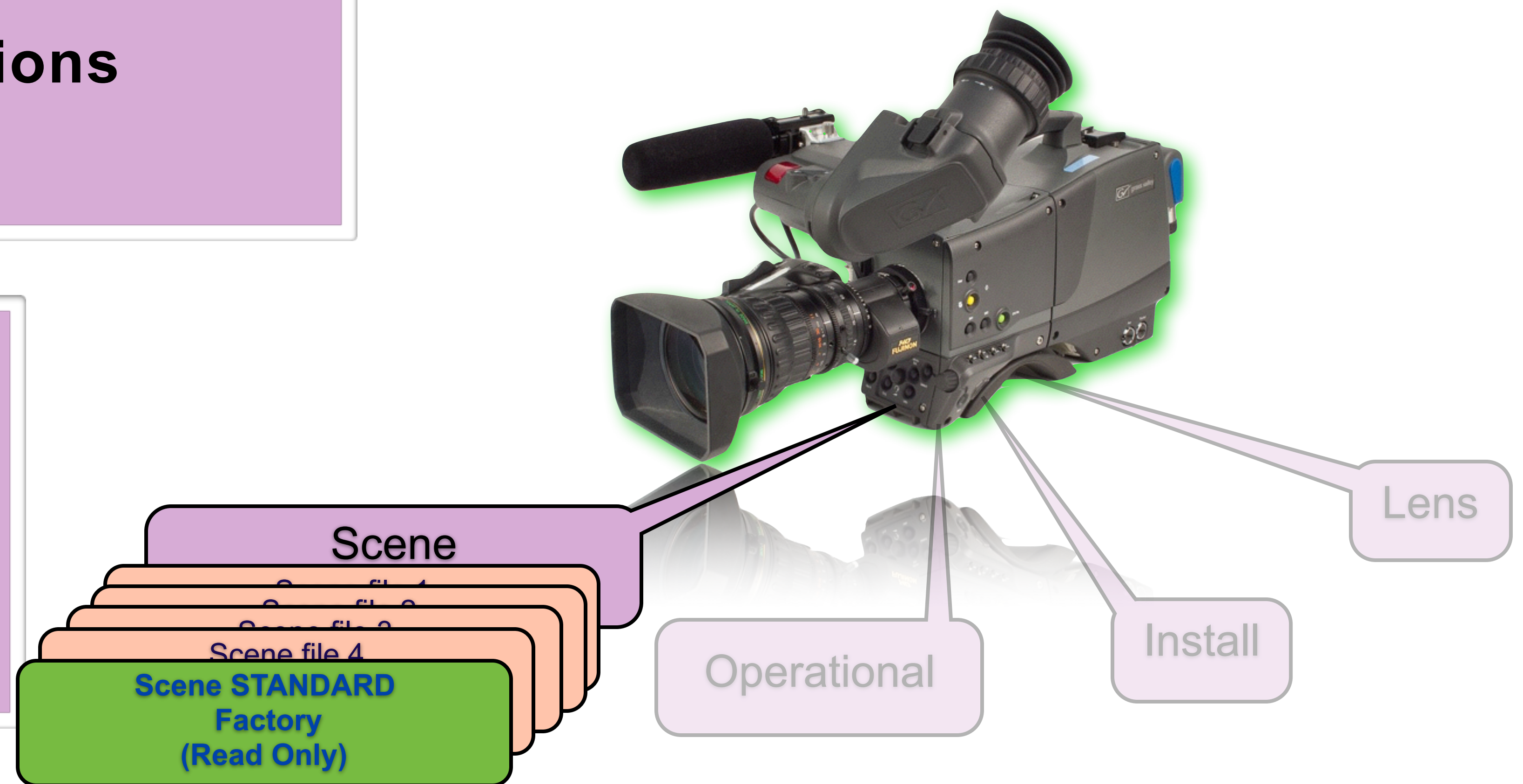
Scenefile handling

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

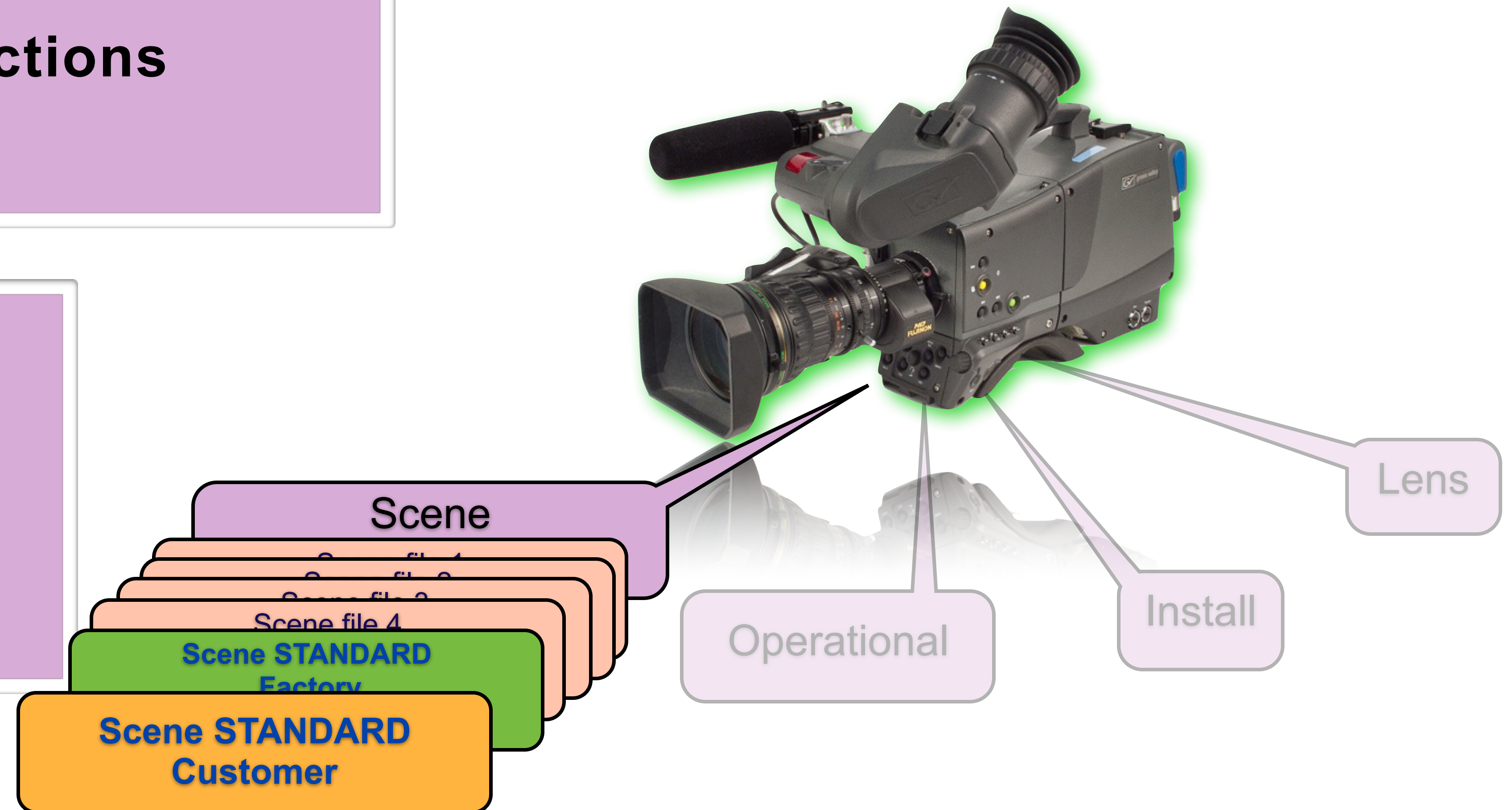
Scenefile handling

- 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



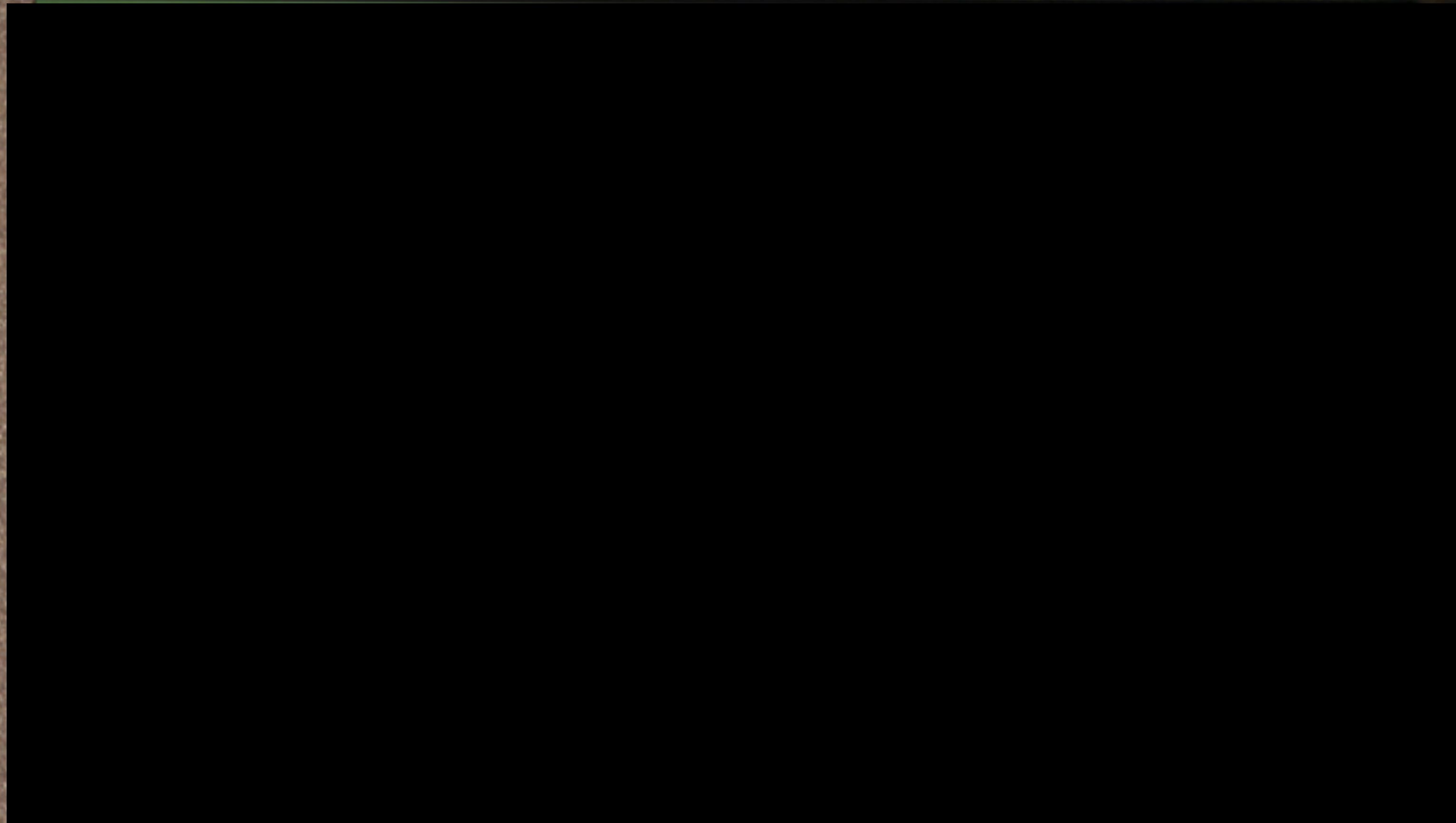
Step	Camera sw. panel User level 2,3	Menu Camera User level 2,3	OCP or MCP
A	Standard Recall GREEN Button	MenuFiles Standard Recall	Standard Recall FACTORY
B	Select AW1 or 2	Auto White	AW 1 / Auto White
C	IRIS		IRIS + MBlack
D		MenuVideo Flare	Flare



Generic Operational Controls

part 2 Web Training

ABC Rule Standard setting



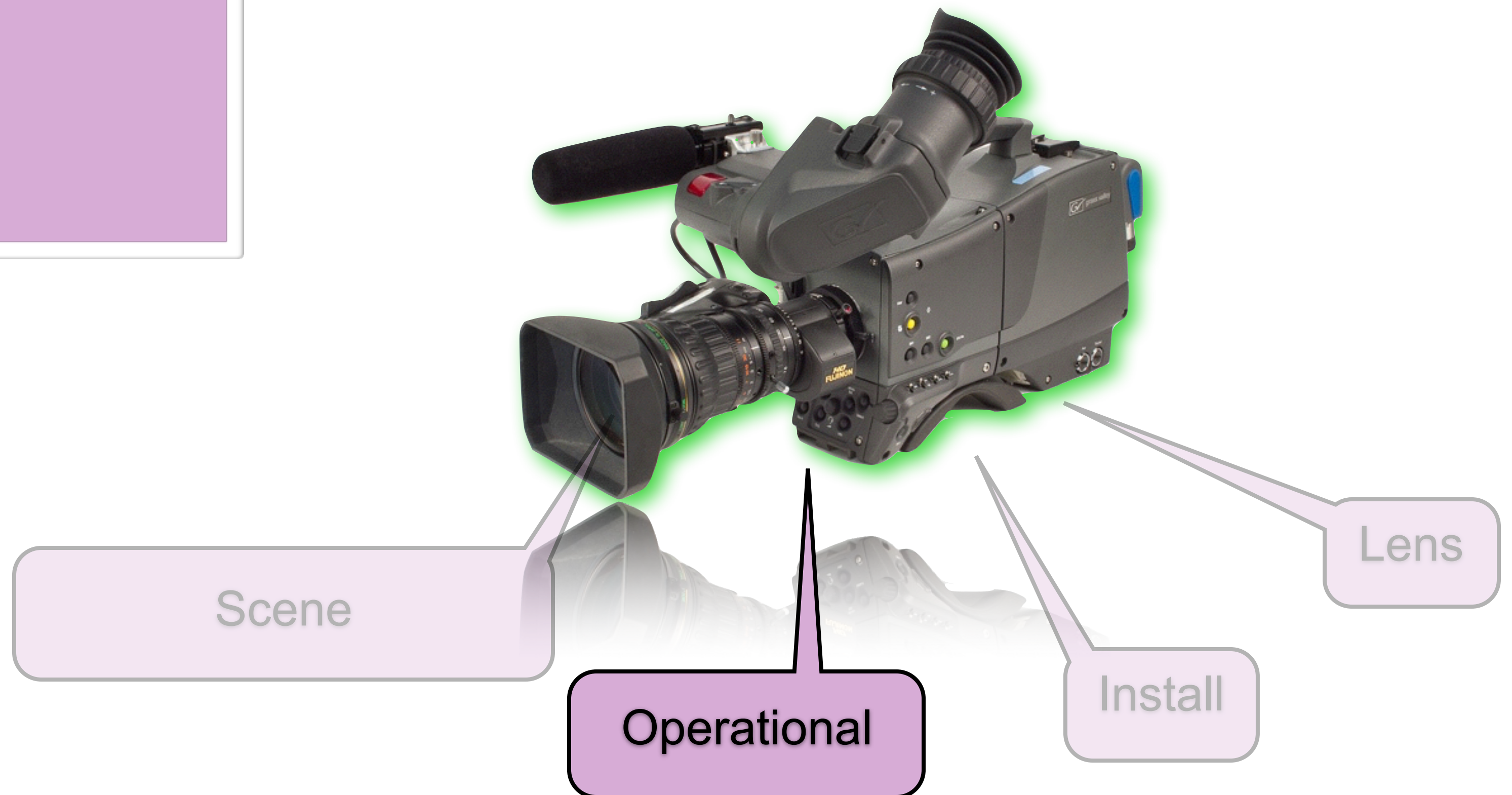
Operational file handling

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.**



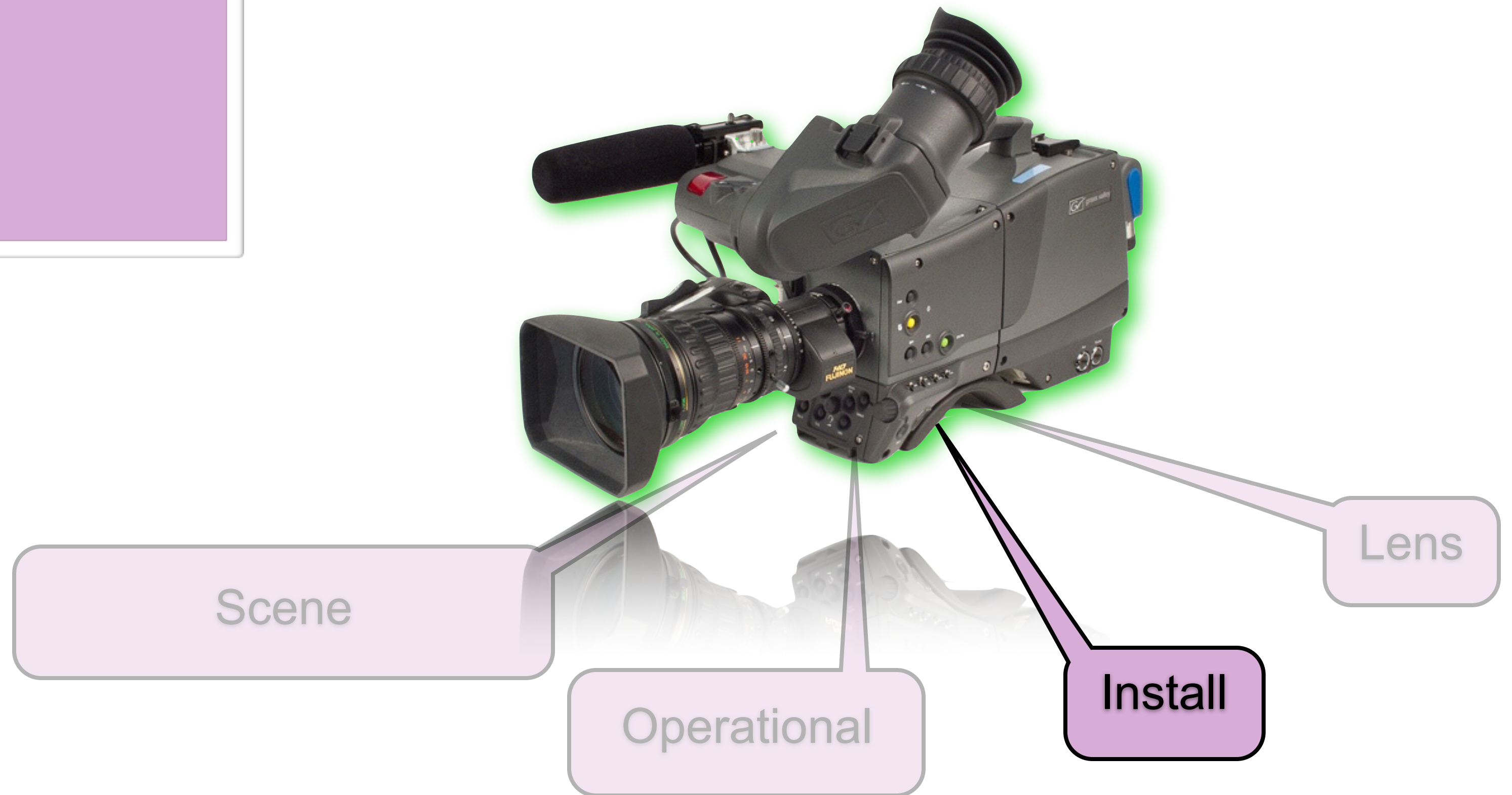
Install file handling

- **Locations of the functions**
The Install file group

- **Install**

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

Video Modes / Timing etc



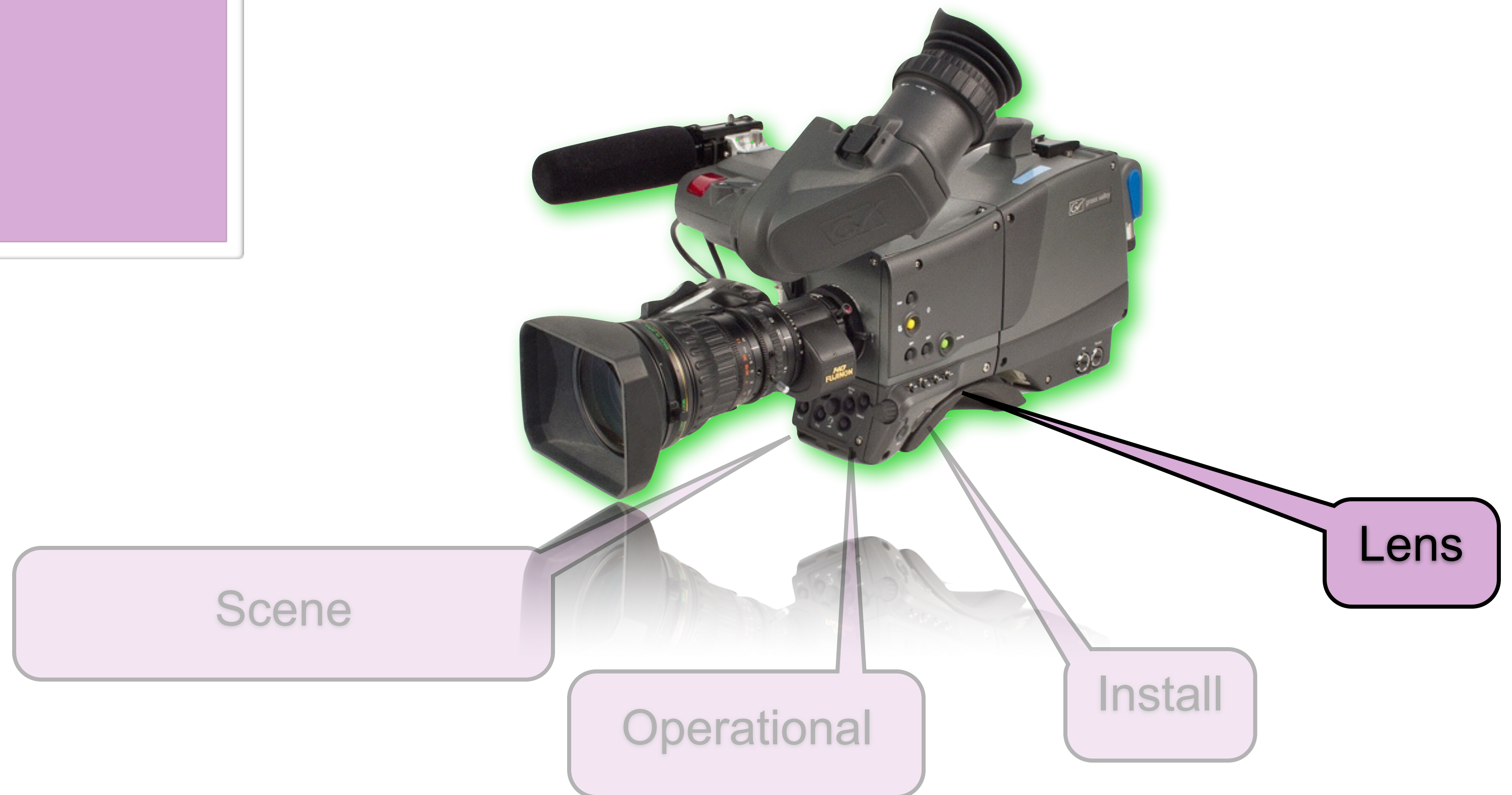
Lens file handling (not for LDK8000)

- **Locations of the functions**
The Lens file group

- **Lens**

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

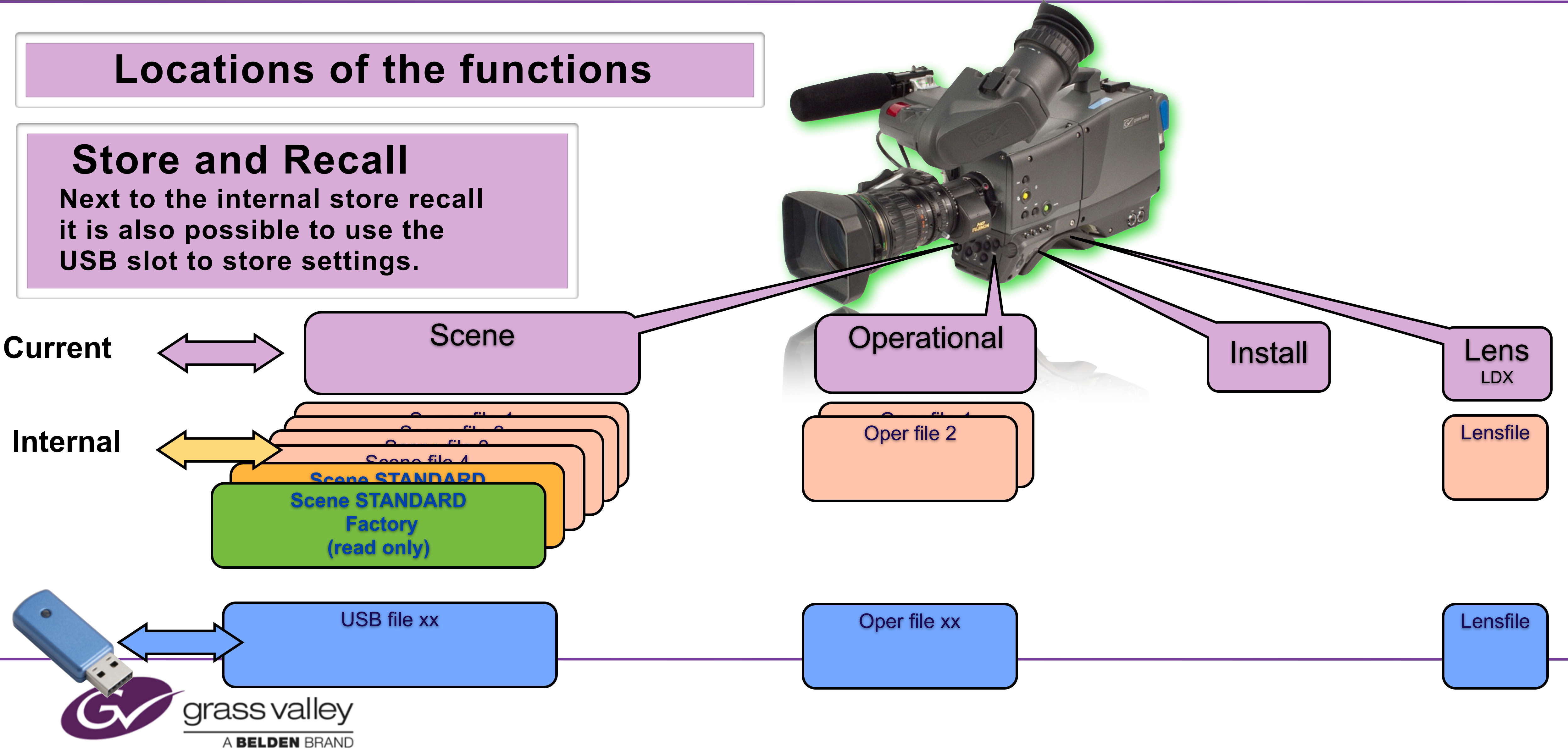
White Shading / Lens setting etc.



File handling

Locations of the functions

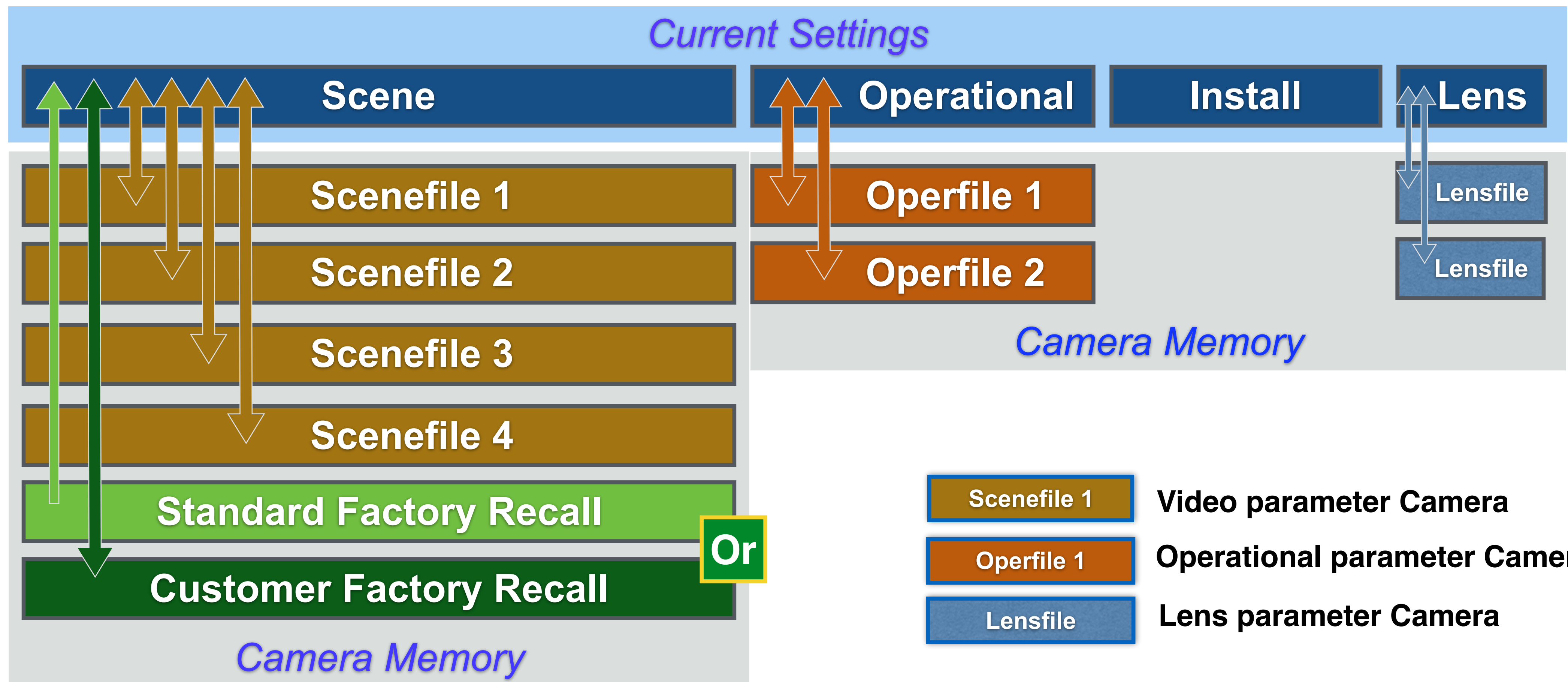
Store and Recall
Next to the internal store recall it is also possible to use the USB slot to store settings.



Generic Operational Controls (File-handling)

part 2 Web Training

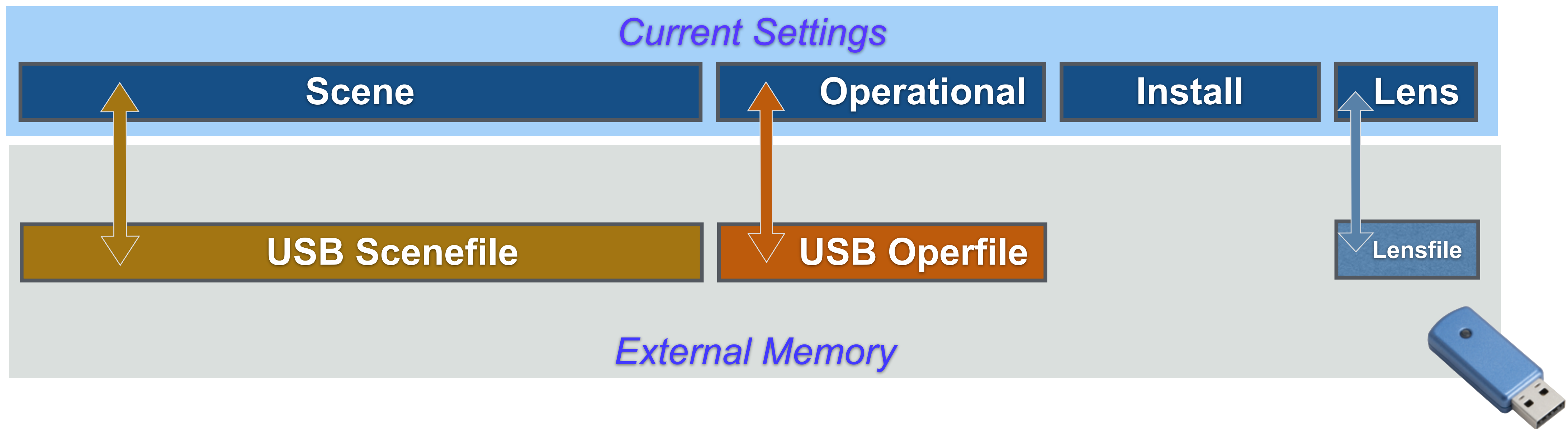
■ In camera function parameter



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

Functional LDX series

- ✦ GV Cameras developed several new products
- ✦ This part gives you some more details about the Basics and Functions within the LDX product line

In this session:

- ✦ Basics Video / Image processing
- ✦ Generic controls
- ✦ Connections and Controls
- ✦ Scenefile handling (Card and USB)
- ✦ **ArtTouch Menu (LDX)**
- ✦ Menu Basics - Camera / XCU
 - OCP400
 - Viewfinder
- ✦ Network C²IP



Generic Operational Controls (More)

We want more controls. We need:

- **Transfer Curve:**

- Control over the mapping of input levels to the display
(knee, gamma, contrast)

- **Color:**

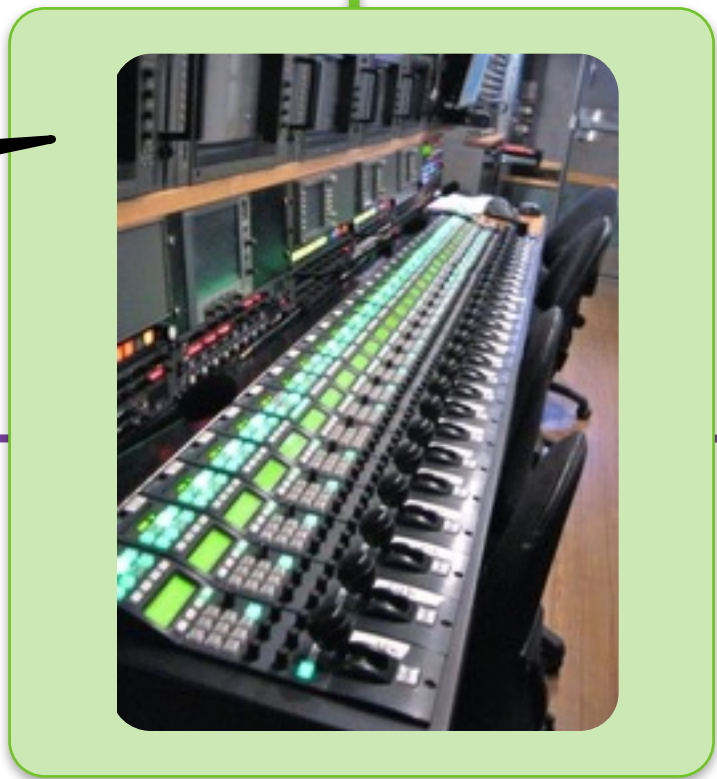
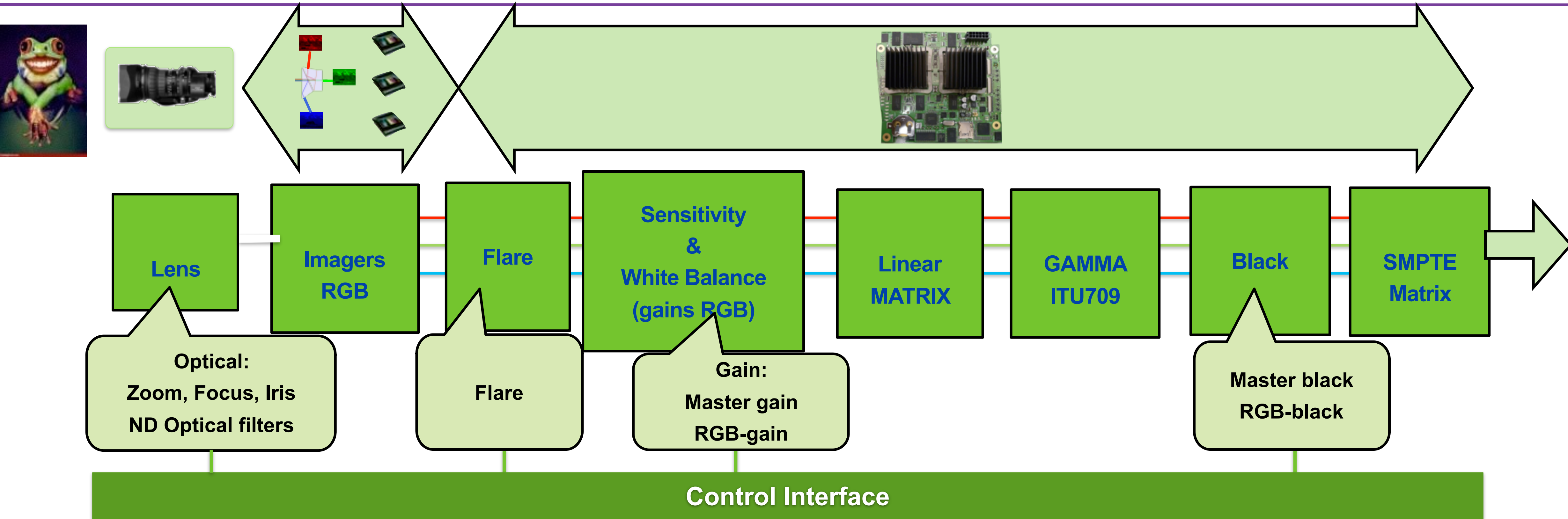
- Map colors outside of dynamic range in a controlled way into the range
(knee, knee saturation, color protect)
- Be able to artistically change the color impression of a picture
(saturation control, color corrector, matrix changes)

- **Sharpness:**

- Enhance the sharpness in the picture
- This depends on content and taste
(Texture versus Edges, Skin detail)....

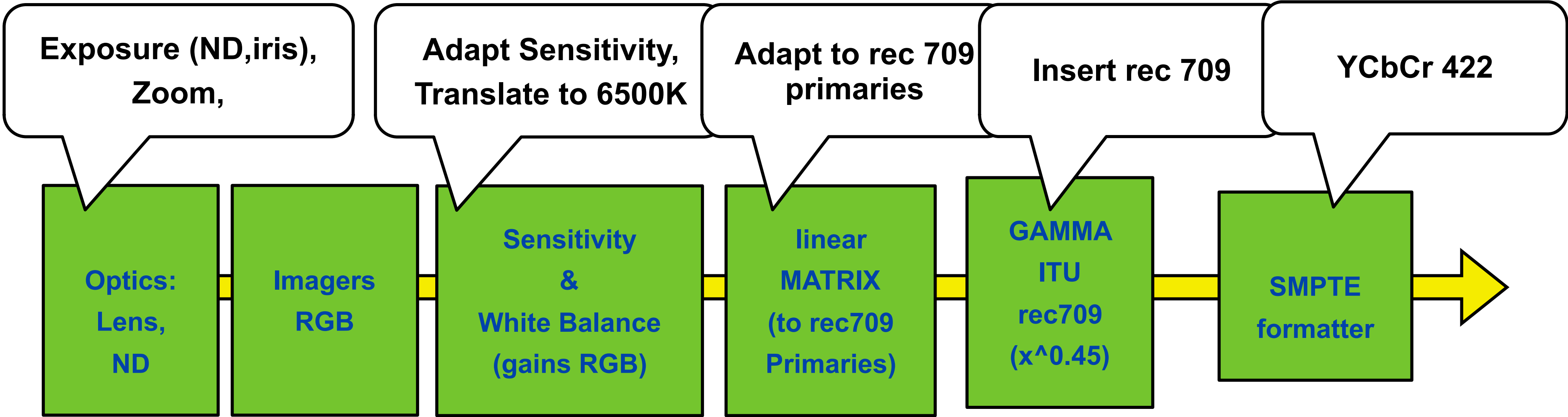
Generic Operational Controls (Overview)

part 2 Web Training



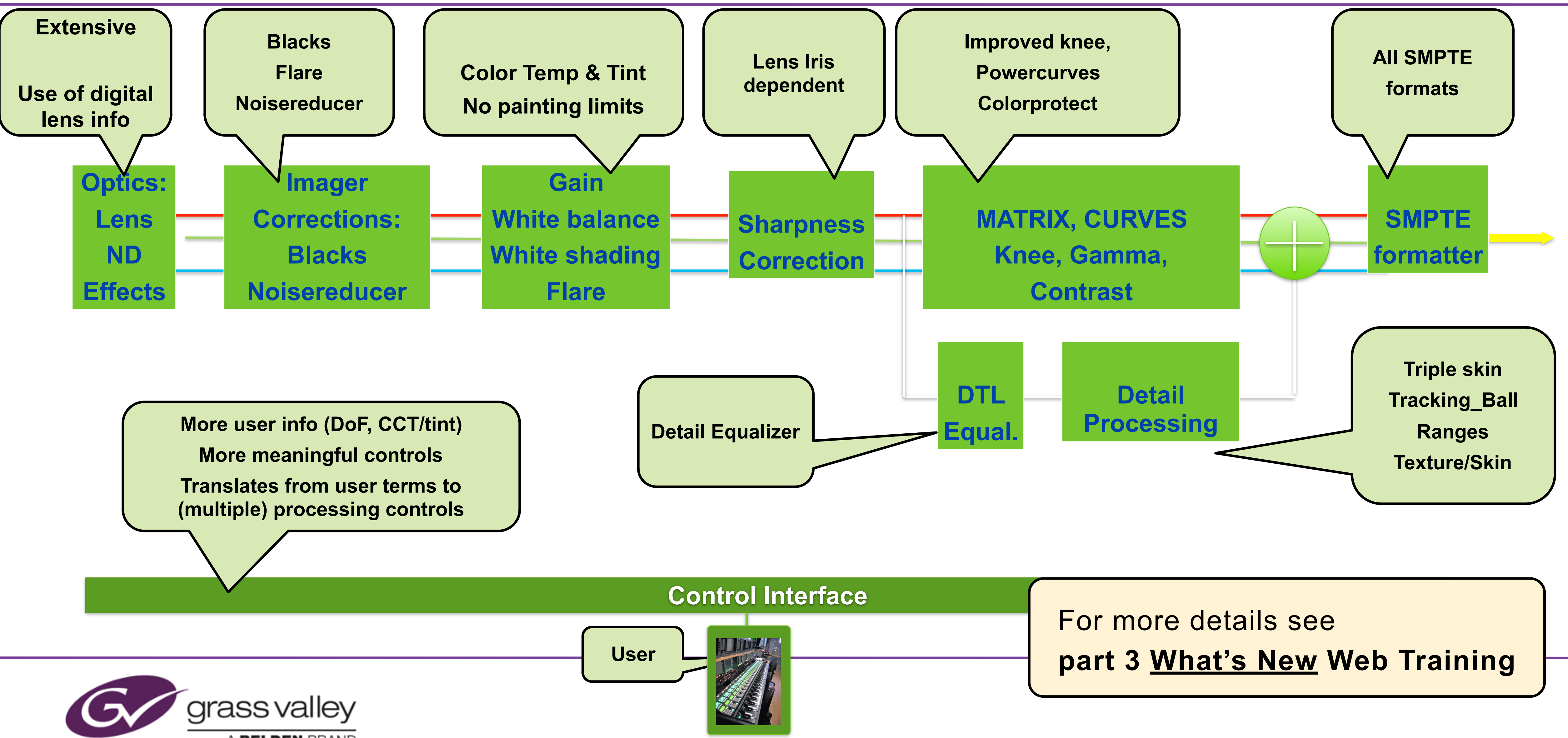
Generic Operational Controls (Overview)

part 2 Web Training



Generic Operational Controls (and More)

part 2 Web Training



Functional LDX series

part 2 Web Training

• The ArtTouch Menu

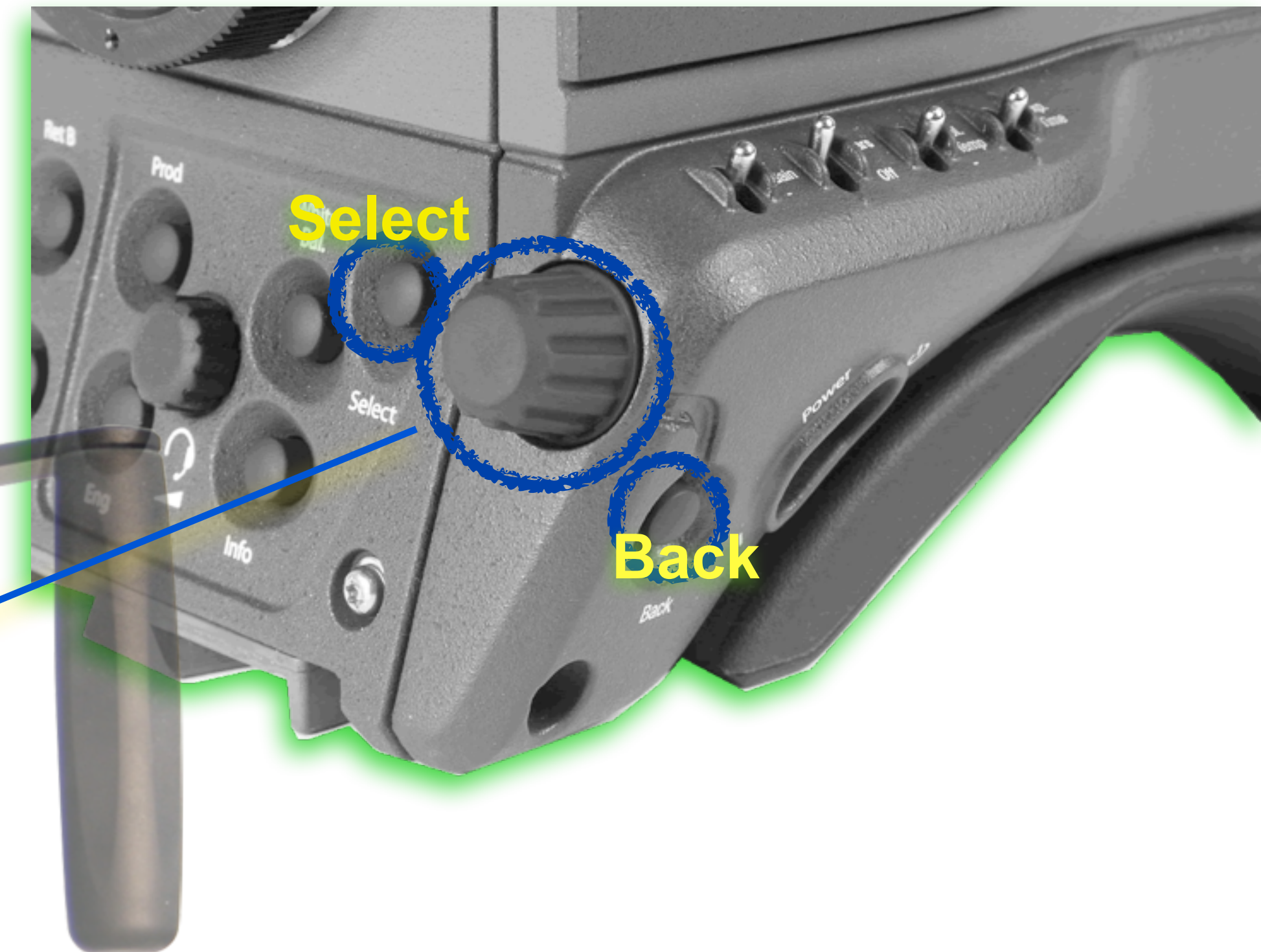
• LDX Menu structure

▶ Menu Off
Menu Display
Operator Toolbox
Production Setup
Creative Control

exec
On
▶▶
▶▶
▶▶

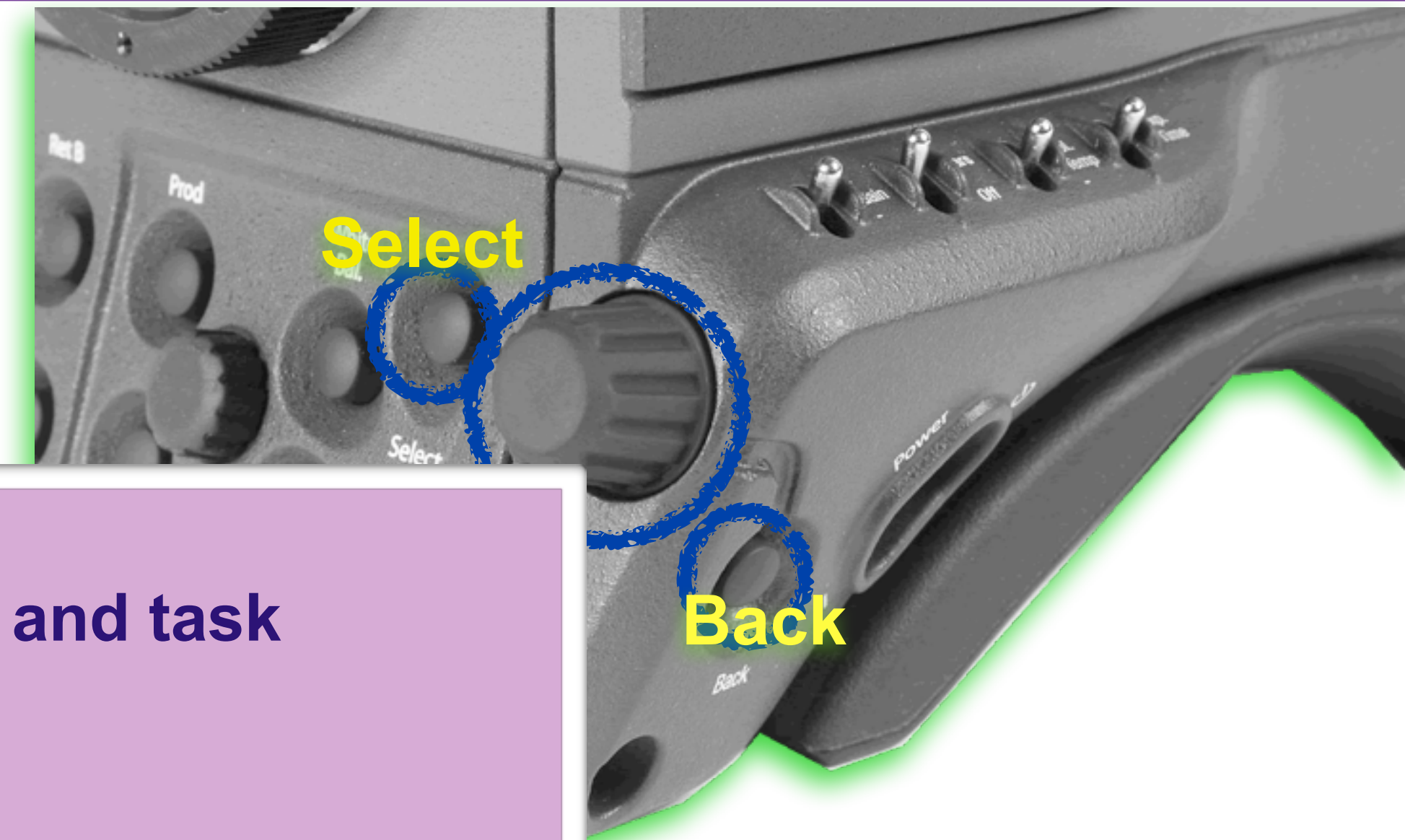
Root

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



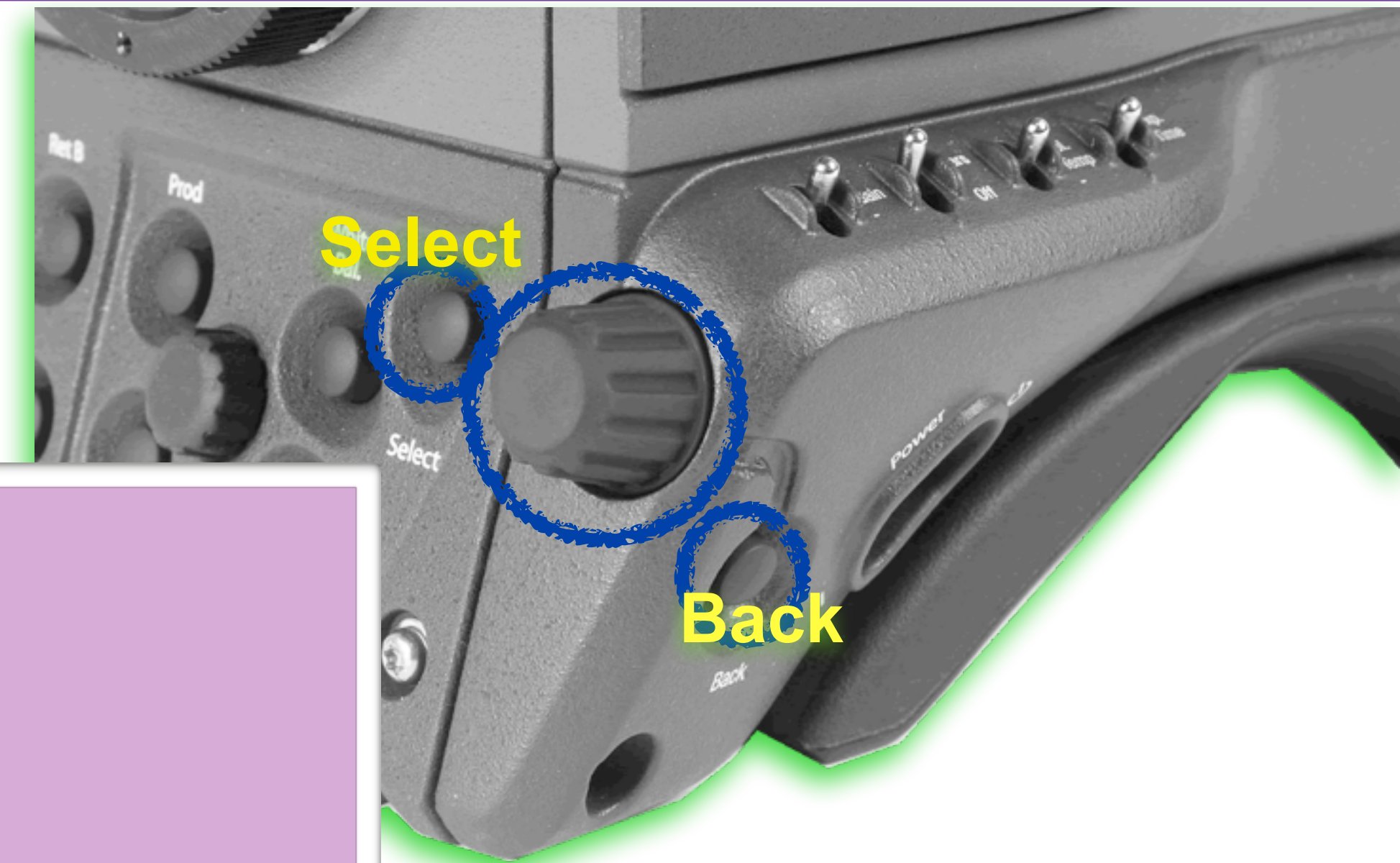
• The ArtTouch Menu

- ◆ 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.



• 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.



Functional LDX series

part 2 Web Training

• The ArtTouch Menu

♦ 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

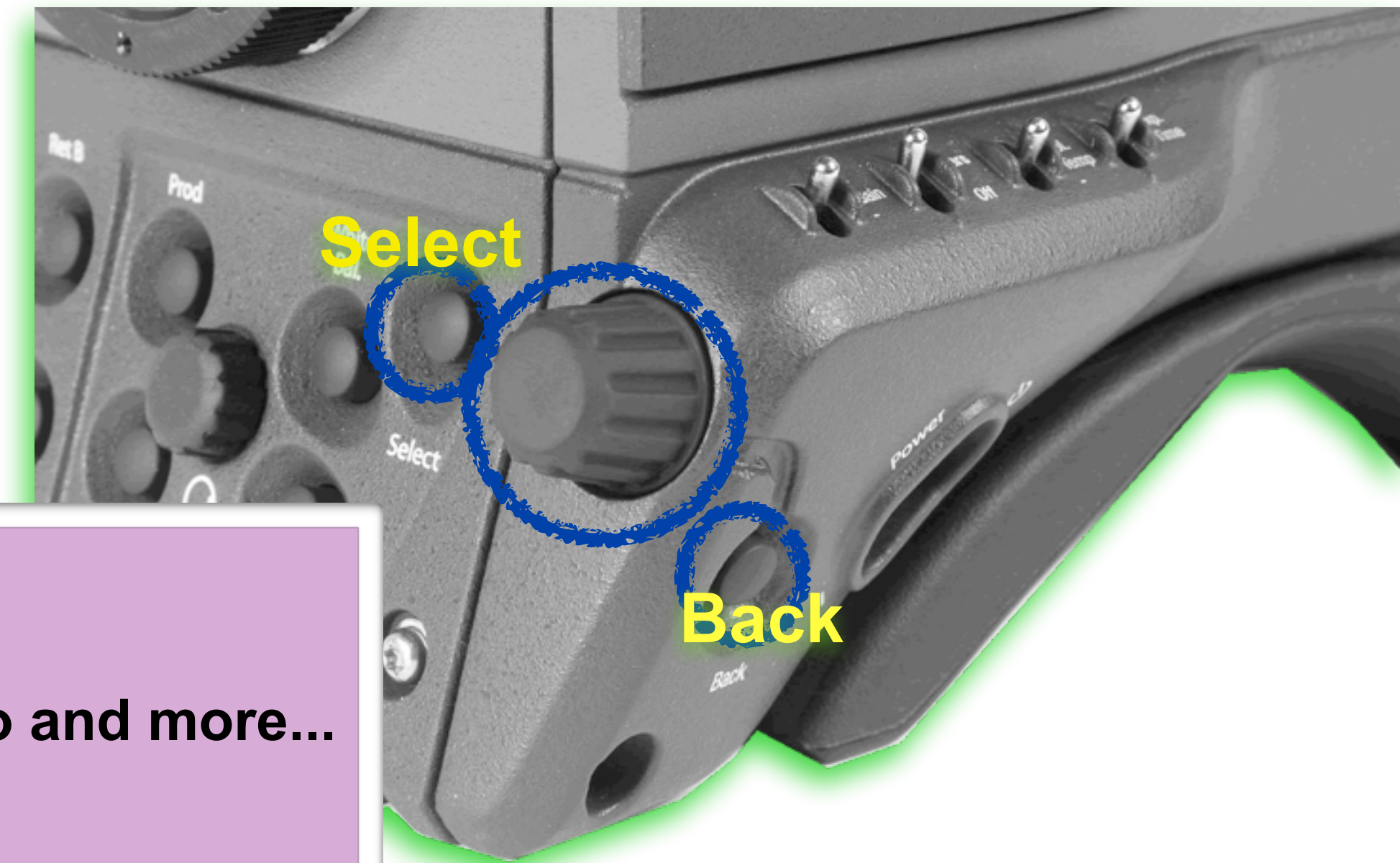
Video Director, defining "The Look" and the production features

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...



Functional LDX series

part 2 Web Training

- **The ArtTouch Menu**

- ♦ **Licenses**

Defining operational functional capability for the users and owners

- ♦ **Diagnostics**

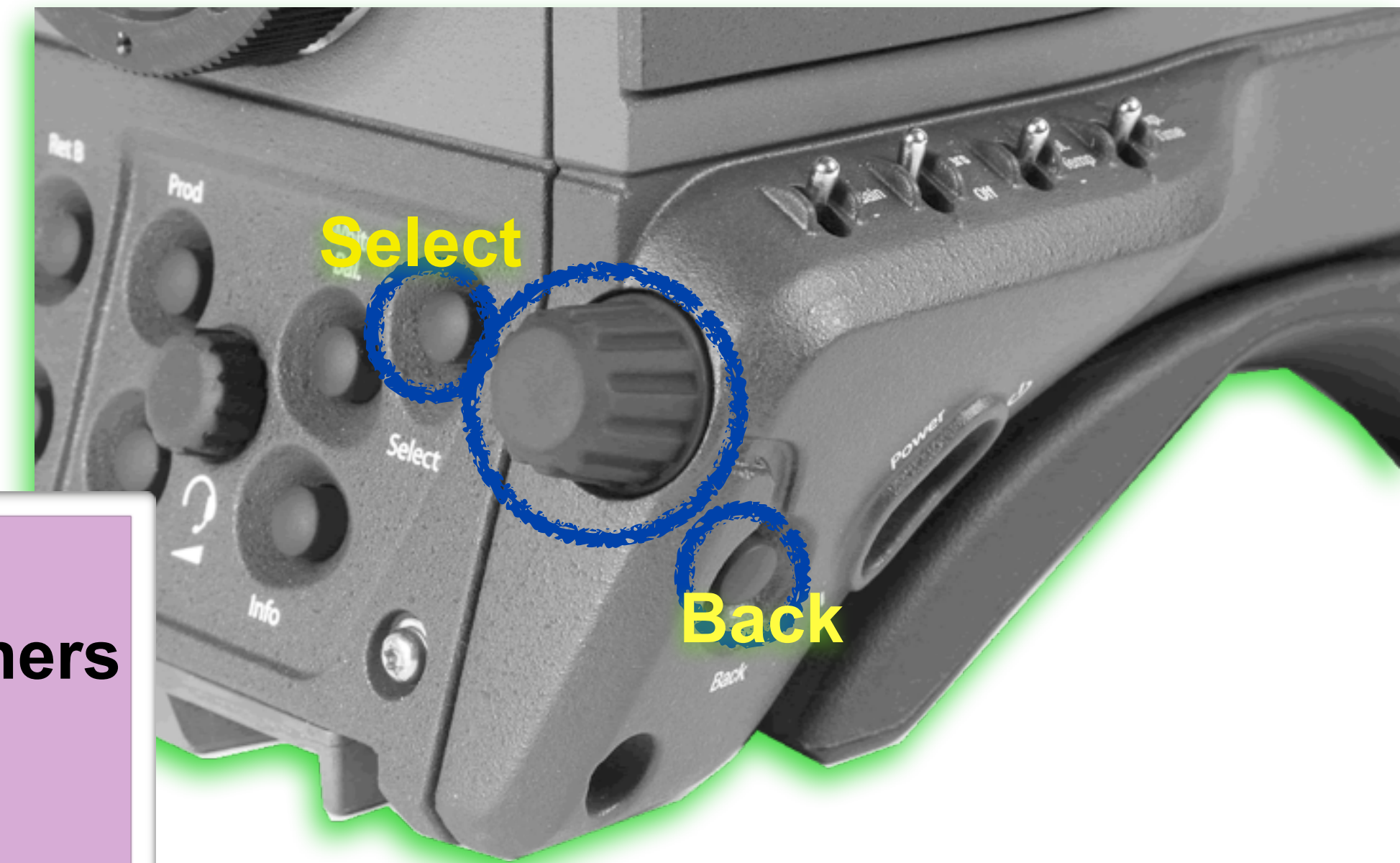
Service related information

Camera diagnostics,

Extensive diagnostic features to be added later

- ♦ **Service**

Service related information



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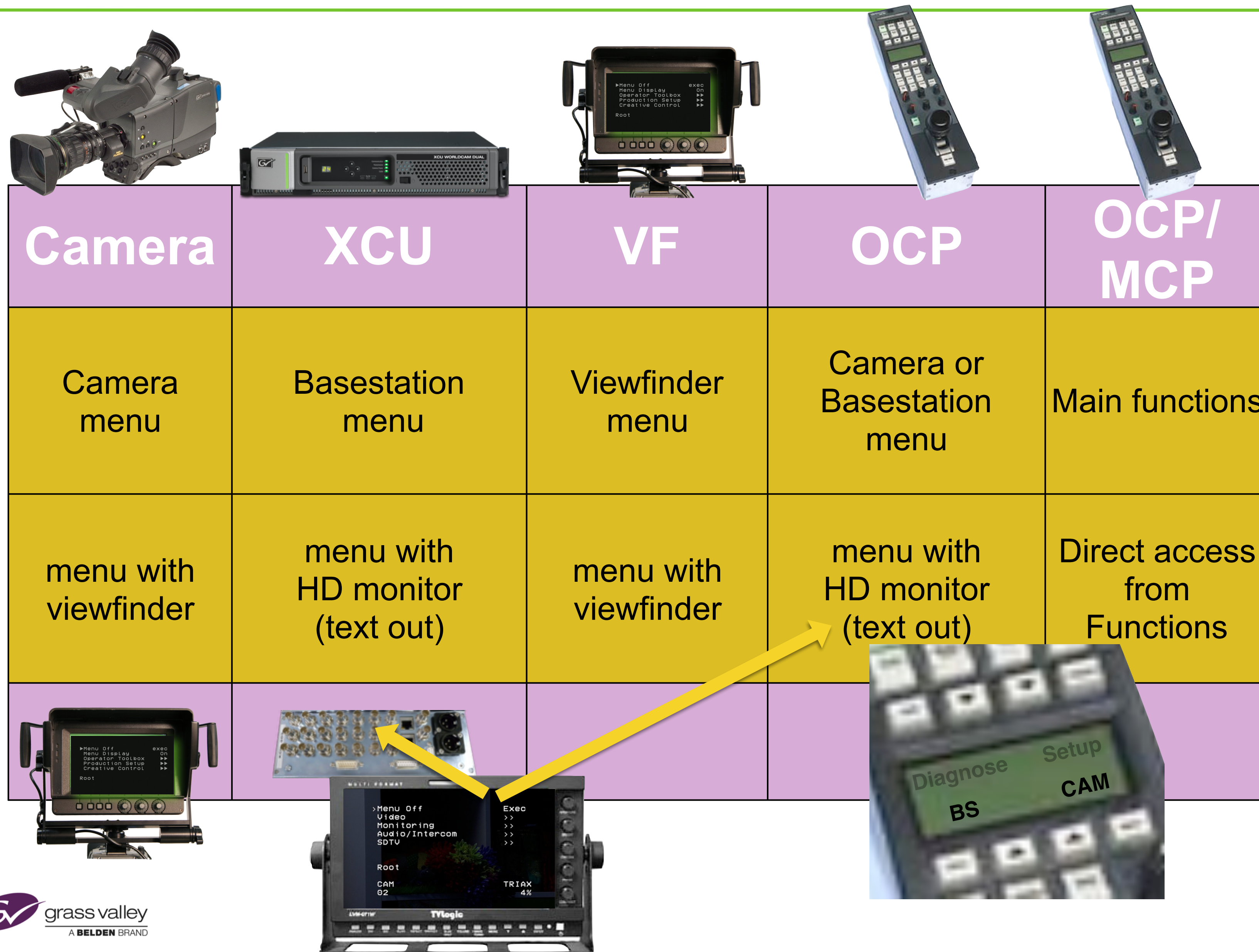
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- ✦ **Menu Basics**
- ✦ - Viewfinder
- ✦ Network C²IP



Generic Operational Controls

part 2 Web Training



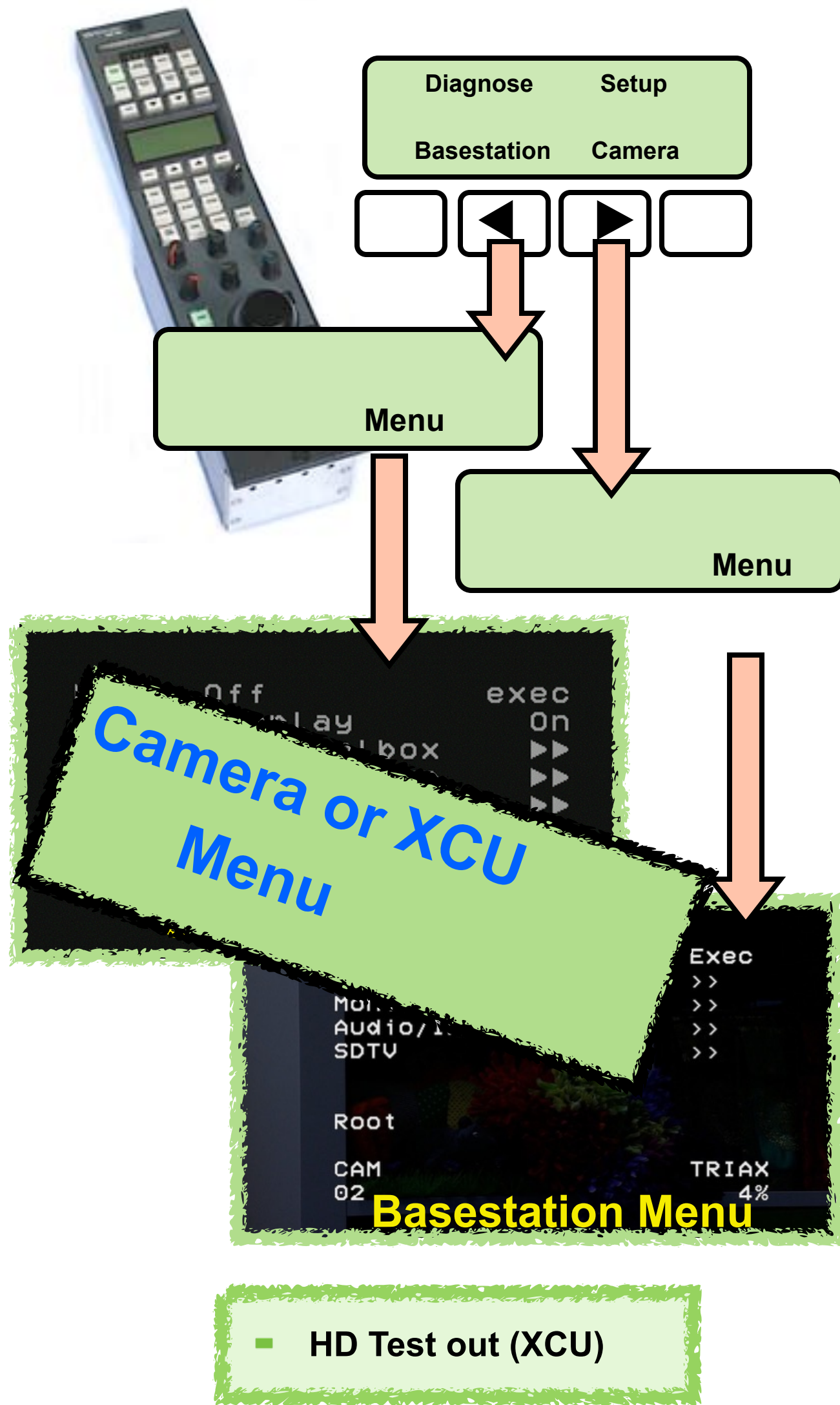
Menus

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

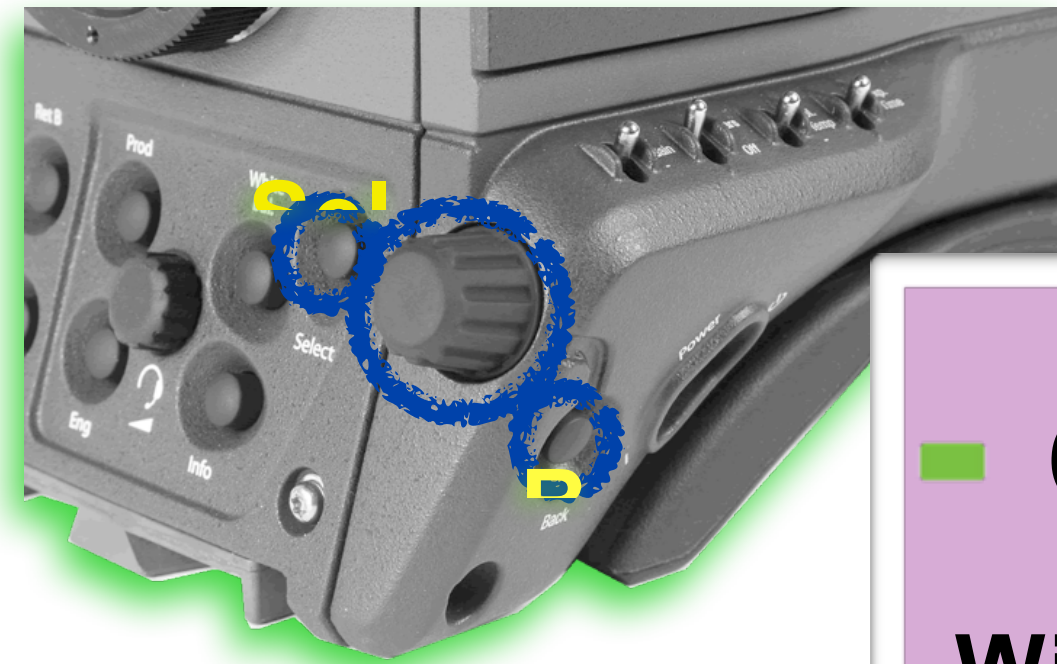
Generic Operational Controls

part 2 Web Training



Generic Operational Controls

part 2 Web Training



■ 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

part 2 Web Training



■ 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

part 2 Web Training



Viewfinder Menu

■ 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

Generic Operational Controls

part 2 Web Training



Generic Operational Controls

part 2 Web Training

- **XCU Menu for Basestation settings**

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

Settings from XCU

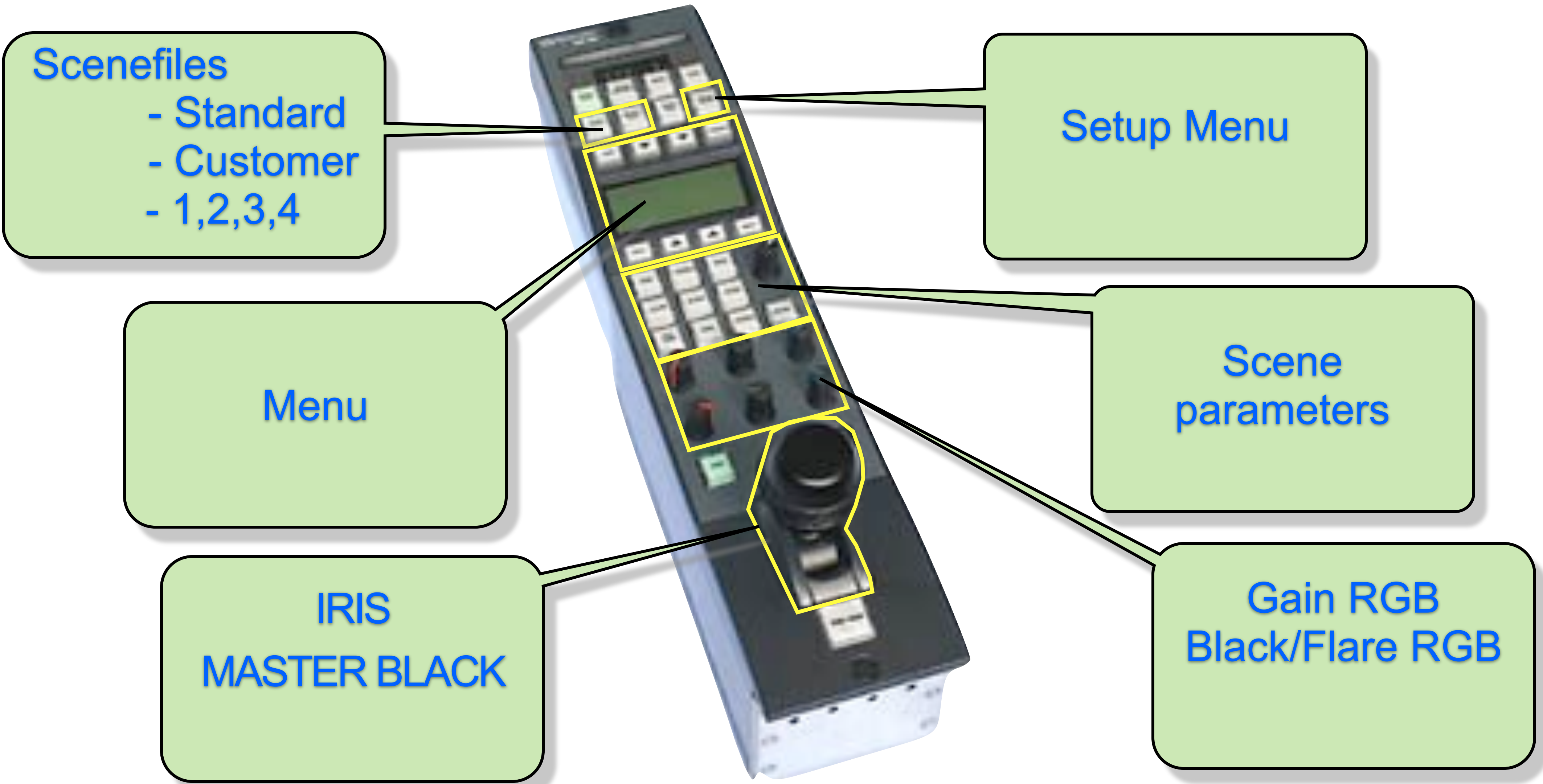
- Diagnostics
- Settings

■ HD Test out (XCU)



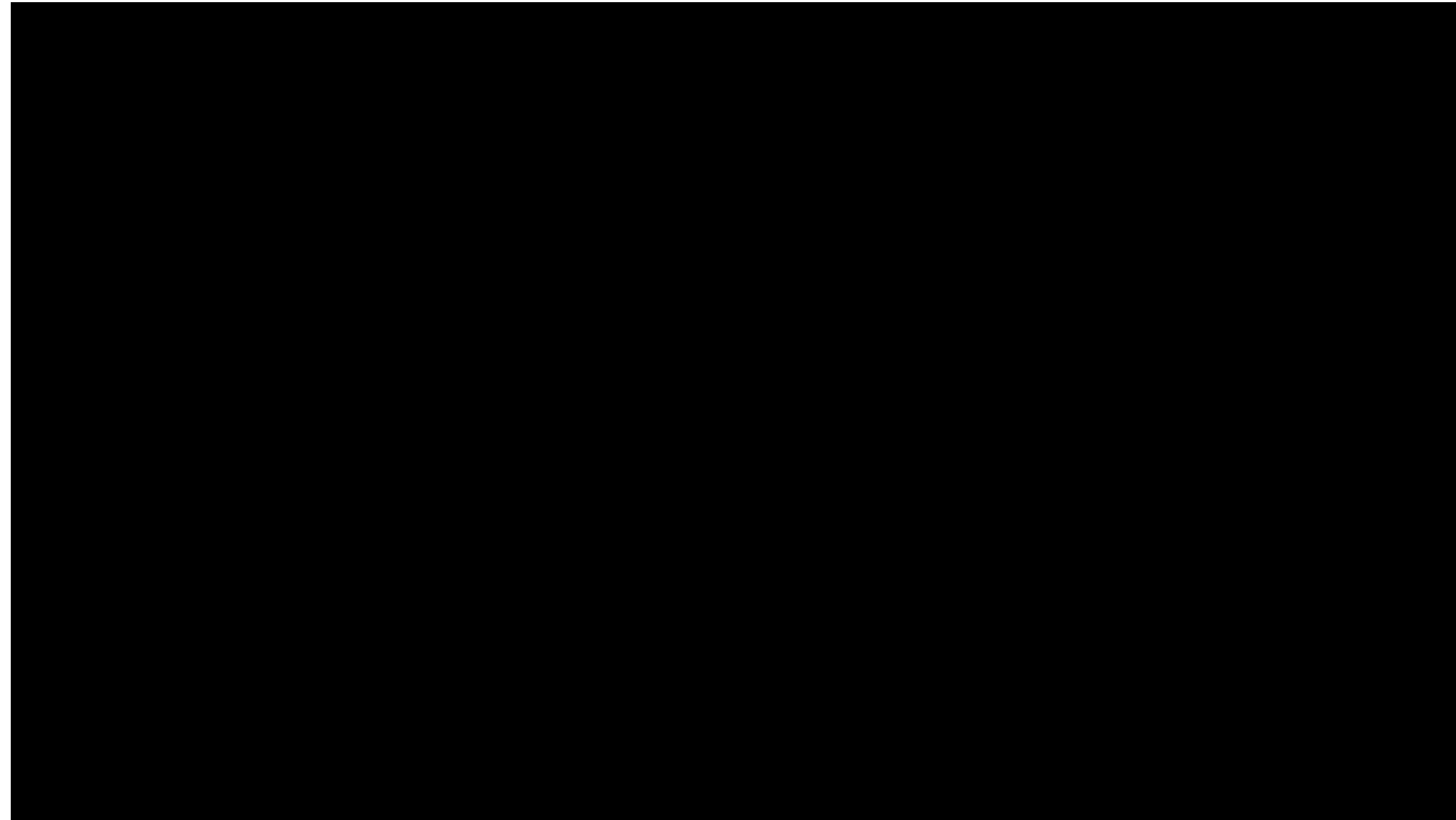
Generic Operational Controls

part 2 Web Training



Camera or XCU

menu from OCP



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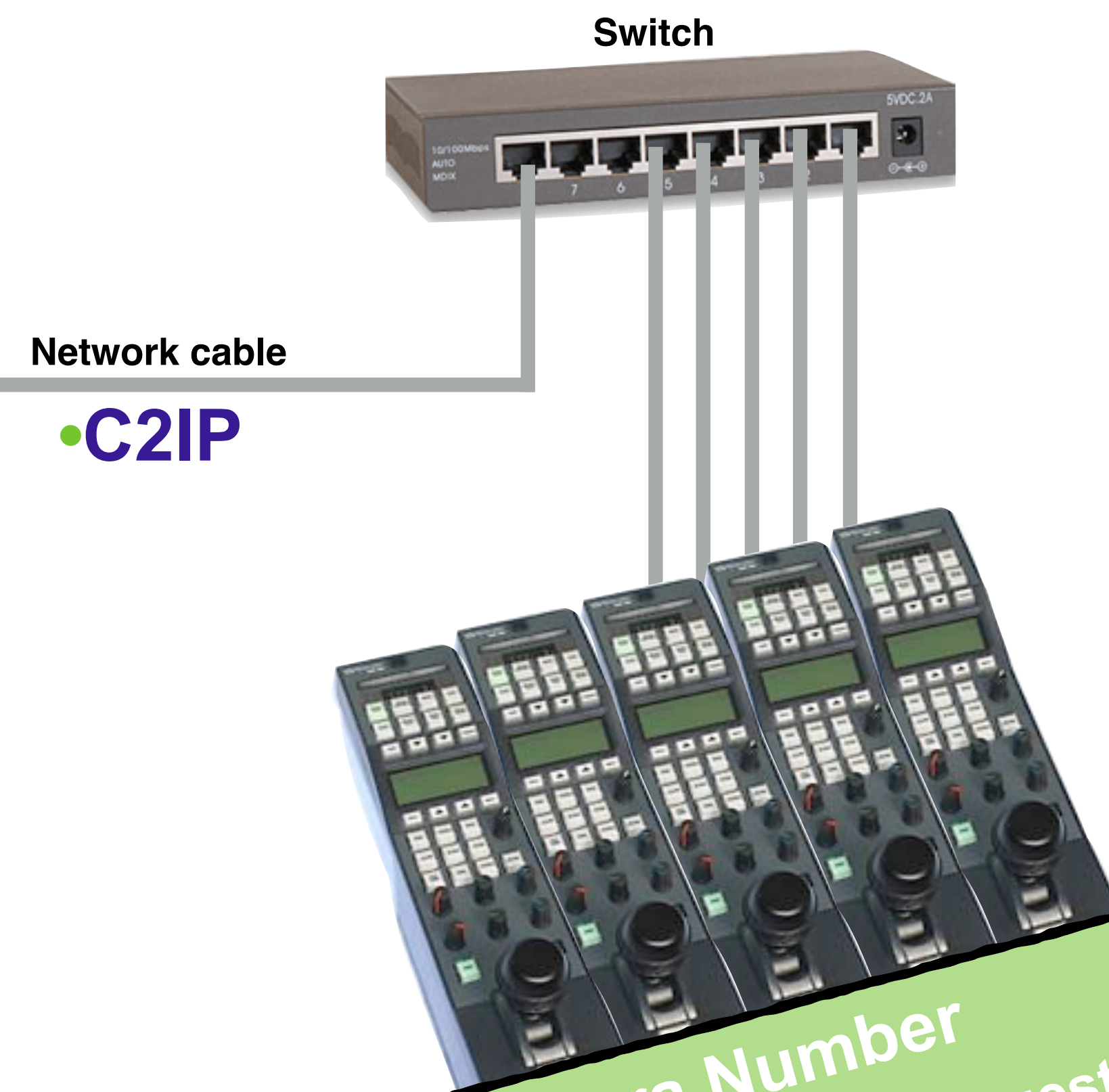
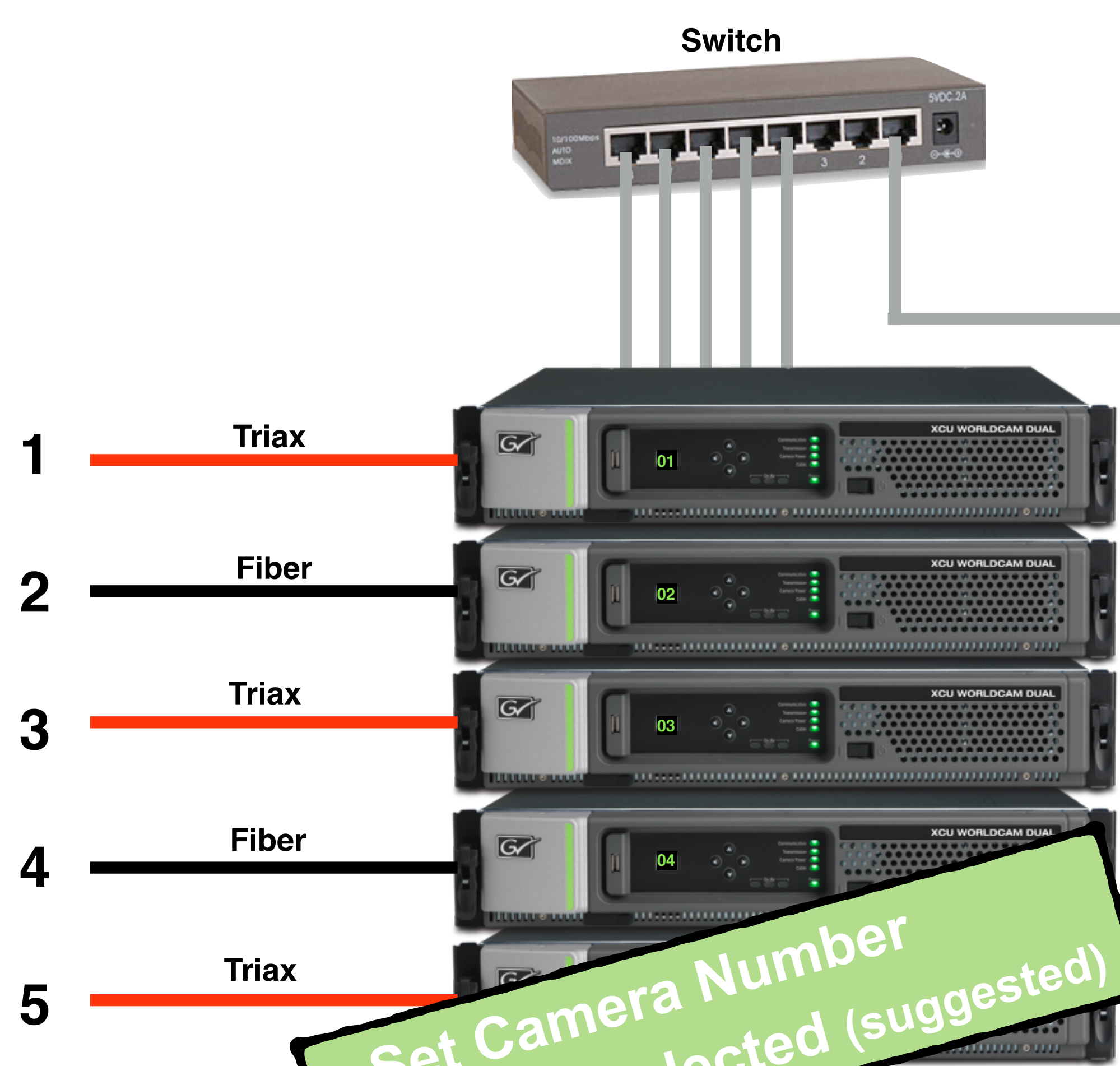
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Generic Operational Controls

part 2 Web Training



•C2IP