

A professional video camera on a tripod is the central focus, with a color calibration chart on a stool in the background. The scene is dimly lit, emphasizing the equipment. A large red diagonal shape is on the left side of the frame.

Canon

Canon Colour Matching Application (CCMA) Easy Operation Guide

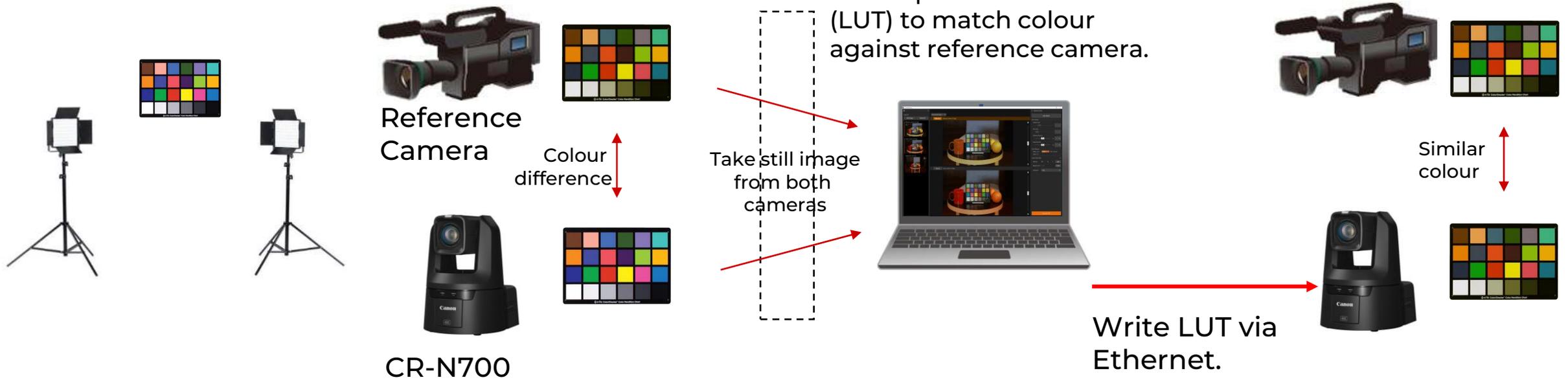
Canon Europe Ltd.

System overview

Set camera & chart

Take Stills

Matching



Required Hardware

CR-N700



Windows PC

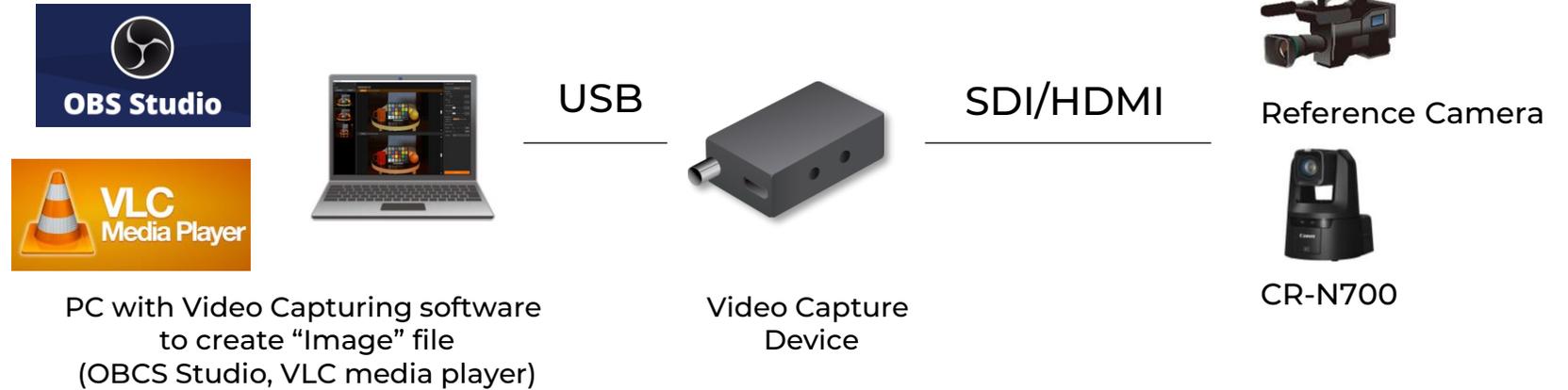


Colour Chart



The ways of image capture of SDI/HDMI VIDEO to PC

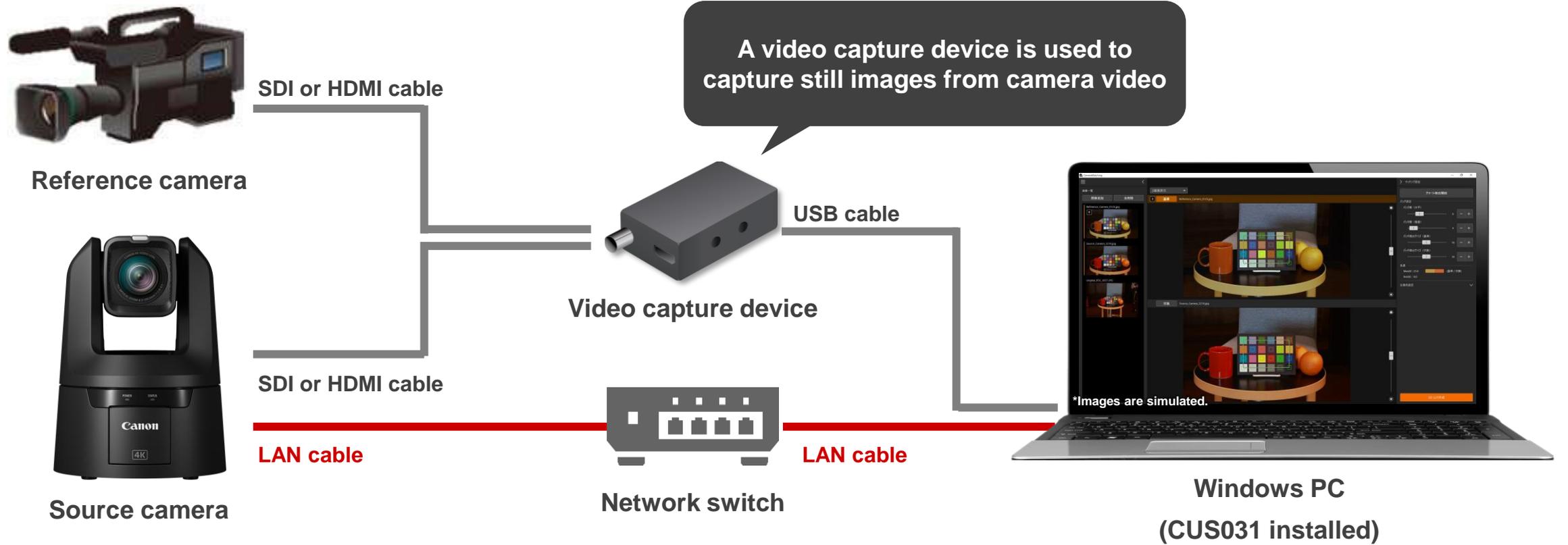
[1] SDI-> USB capture device



[2] SDI-> Recorder/Monitor to capture SDI image



Configuration Example



Equipment Spec

Type	Source camera	Reference camera	Video capture device	Color chart
Equipment	 <p>Remote camera CR-N700</p>	<p>Any manufacturer or model, provided the following requirements are met</p>		
Requirements	<ul style="list-style-type: none"> LUT can be saved with XC protocol 	<ul style="list-style-type: none"> Gamut: Conforms to BT.709 or HDR Output: 2K or higher 	<ul style="list-style-type: none"> SDI or HDMI input Capable of output to PC 	<ul style="list-style-type: none"> Grid type 2 to 15 colors per side
Remarks	-	-	<p>Models for which connection with the CR-N700 has been checked :</p> <p>BMD: UltraStudio Recorder 3G (2K support)</p> <p>BMD: UltraStudio 4K Mini (4K support)</p>	-

Application Spec

Function		Specs
Color chart extraction		Automatic, manual
Selected points settings		Up to three points
Supported still image formats		BMP, TIF, PNG, JPG
Supported OS		Windows 11, Windows 10 64-bit
Languages	Application UI	Japanese/English
	User Manual	Japanese/English/Chinese (simplified)/French/German/Italian/Spanish

Set camera & chart

Set camera & chart

Take Stills

Matching

[Chart & Camera position]

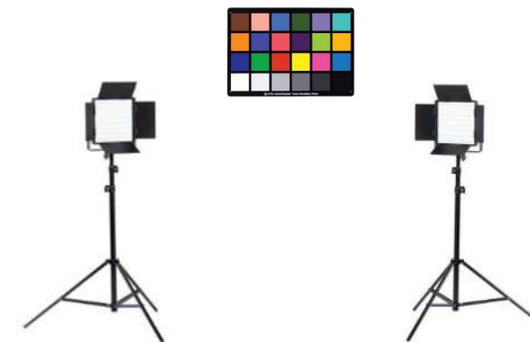
1. Put a Colour chart in target lighting condition.
2. Put the Reference Camera and CR-N700 in front of the Colour chart.

[Reference Camera Setting]

1. Adjust the camera's exposure, white balance appropriately according to the target lighting.

[CR-N700 Setting]

1. Select "unlocked" CP (recommend to use User CPs).
2. Select manual in shooting mode (exposure), set the exposure value close to the reference camera.
3. Select manual white balance, select the similar value to the white balance of reference camera.



Exposure setting

The screenshot shows a web-based camera control interface for a Canon CR-N700. The main view is a live video feed of a chair with a color calibration chart. Below the feed is a control panel with several tabs: Exposure, WB, Focus, Custom Picture, PTZ/IS, Preset, and Other Functions. The Exposure tab is active, showing various settings. Red boxes and arrows highlight specific settings with corresponding text boxes:

- Shooting Mode:** The 'M' (Manual) mode is selected and highlighted with a red box. A red arrow points to it from a text box that says "Select 'Manual'".
- Shutter Mode:** The dropdown menu is set to "Speed (sec.)" and highlighted with a red box. A red arrow points to it from a text box that says "Select other than Auto".
- Iris (Aperture Value):** The "Auto" checkbox is unchecked and highlighted with a red box. A red arrow points to it from a text box that says "Uncheck 'Auto'".
- Gain (dB):** The "Auto" checkbox is unchecked and highlighted with a red box. A red arrow points to it from a text box that says "Uncheck 'Auto'".

Other visible settings include ND Filter (Off), Infrared Shooting (IR) (On), ISO/Gain (Gain), and High Sensitivity Mode (On). The interface also features a top navigation bar with a browser address bar showing "192.168.100.1/pages/exposure" and a bottom status bar with navigation icons.

White Balance setting

Setting Page for IP Streaming CameraX +

192.168.100.1/pages/wb

CR-N700

Exposure WB Focus Custom Picture PTZ/IS Preset Other Functions

White Balance Mode

Color Temperature (K) 4550

Shockless WB On

C. Temp. Increment Mired

CC 0

Select "Color Temperature (K)"

Select close value to the reference camera.

Custom Picture/Image detail setting

Setting Page for IP Streaming Camera X

192.168.100.1/pages/cp

CR-N700

- C1: BT.709 Normal [Protect]
- C2: BT.709 Wide DR [Protect]
- C3: BT.709 Standard [Protect]
- C4: Canon Log 3 [Protect]
- C5: PQ [Protect]
- C6: HLG [Protect]
- C7: EOS Standard [Protect]
- C8: EOS Neutral [Protect]
- C9: User09**
- C10: User10
- C11: User11
- C12: User12
- C13: User13
- C14: User14
- C15: User15
- C16: User16
- C17: User17
- C18: User18
- C19: User19
- C20: User20

WB Focus **CP Custom Picture** PTZ/IS Preset Other Functions

Gamma/Color Space BT.709 Normal/BT.709 Look File On

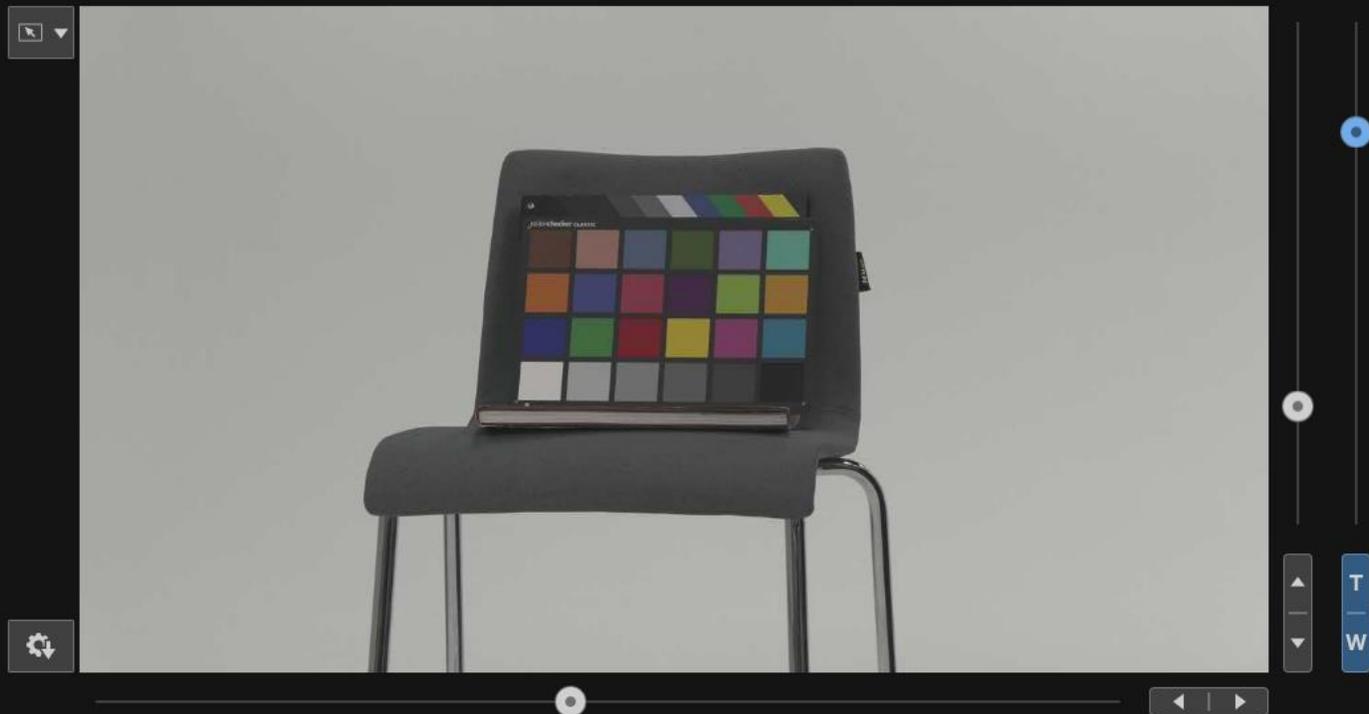
Color Matrix Video Original: With Look File:

Reset Edit

CP File Name Up to 16 characters User09

Delete Register

Select unlocked CP.
Recommend to use User CPs in order not to affect pre-defined CPs.



Exposure WB Focus **CP Custom Picture** PTZ/IS Preset Other Functions

CP File
C9: User09 [Dropdown] [Icon]

Reset [Button] Edit [Button]

CP File Name Up to 16 characters
User09 [Text Input]

Gamma/Color Space
BT.709 Normal/BT.709 [Dropdown]

Color Matrix
Video [Dropdown]

Look File On

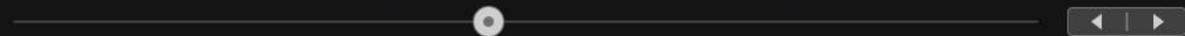
ColorMatching.cube
Original: BT.709 Normal/BT.709
With Look File: Conform to Custom Picture

Delete [Button] Register [Button]

Delete Look File if it is already registerd.



Vertical control panel with a blue slider knob at the top, a white slider knob in the middle, and buttons labeled 'T' and 'W' at the bottom.



Exposure WB Focus **CP Custom Picture** PTZ/IS Preset Other Functions

CP File
C9: User09



Gamma/Color Space
BT.709 Normal/BT.709

Look File On

Reset

Edit

Color Matrix
Video

ColorMatching.cube
Original: BT.709 Normal/BT.709
With Look File: Conform to Custom Picture

CP File Name Up to 16 characters
User09

Delete Register

Edit



C9: User09

<p>Black: Master Pedestal</p> <p>-50 [Slider] 50 - + 0</p>	<p>Black Gamma: Level</p> <p>-50 [Slider] 50 - + 0</p>	<p>Knee: Activate <input checked="" type="checkbox"/> On</p>	<p>Knee: Saturation</p> <p>-10 [Slider] 10 - + 0</p>
<p>Black: Master Black Red</p> <p>-50 [Slider] 50 - + 0</p>	<p>Black Gamma: Range</p> <p>-20 [Slider] 50 - + 0</p>	<p>Knee: Automatic <input type="checkbox"/> On</p>	<p>Low Key Saturation: Activate <input type="checkbox"/> On</p>
<p>Black: Master Black Green</p> <p>-50 [Slider] 50 - + 0</p>	<p>Black Gamma: Point</p> <p>-20 [Slider] 50 - + 0</p>	<p>Knee: Slope</p> <p>-35 [Slider] 50 - + 0</p>	
<p>Black: Master Black Blue</p> <p>-50 [Slider] 50 - + 0</p>		<p>Knee: Point</p> <p>50 [Slider] 109 - + 95</p>	

Knee : Automatic = Off



Skin Detail: Effect Level
Off [Dropdown Arrow]

Skin Detail: Assist On

Skin Detail: Hue [Slider: -16 to 16] [Reset] 0

Skin Detail: Chroma [Slider: 0 to 31] [Reset] 16

Skin Detail: Area [Slider: 0 to 31] [Reset] 16

Skin Detail: Y Level [Slider: 0 to 31] [Reset] 16

White Balance: R Gain [Slider: -50 to 50] [Reset] 0

White Balance: B Gain [Slider: -50 to 50] [Reset] 0

Over 100%
Through [Dropdown Arrow]

Color Matrix Tuning: Gain [Slider: -50 to 50] [Reset] 0

Color Matrix Tuning: Phase [Slider: -18 to 18] [Reset] 0

Color Matrix Tuning: R-G [Slider: -50 to 50] [Reset] 0

Color Matrix Tuning: R-B [Slider: -50 to 50] [Reset] 0

Over 100% = Through (Default)

White Balance setting

Setting Page for IP Streaming CameraX +

192.168.100.1/pages/wb

CR-N700

Exposure WB Focus Custom Picture PTZ/IS Preset Other Functions

White Balance Mode

Color Temperature (K)

Color Temperature (K)

Shockless WB On

C. Temp. Increment

Mired

2000 15000 4550

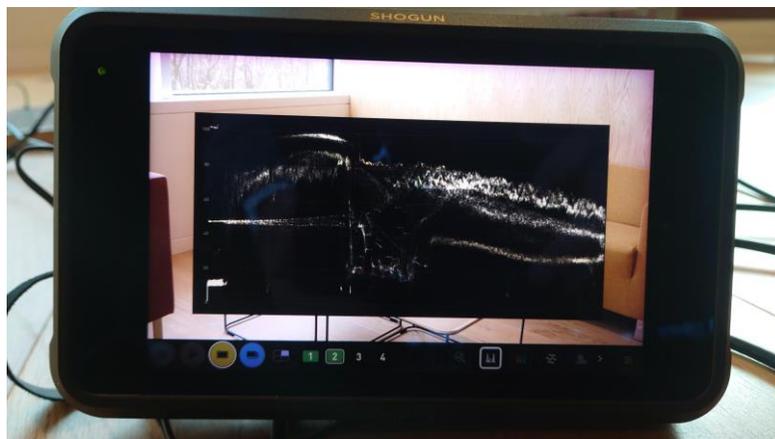
-20 20 0

Select "Color Temperature (K)"

Select close value to the reference camera.

Exposure adjustment

Reference Camera

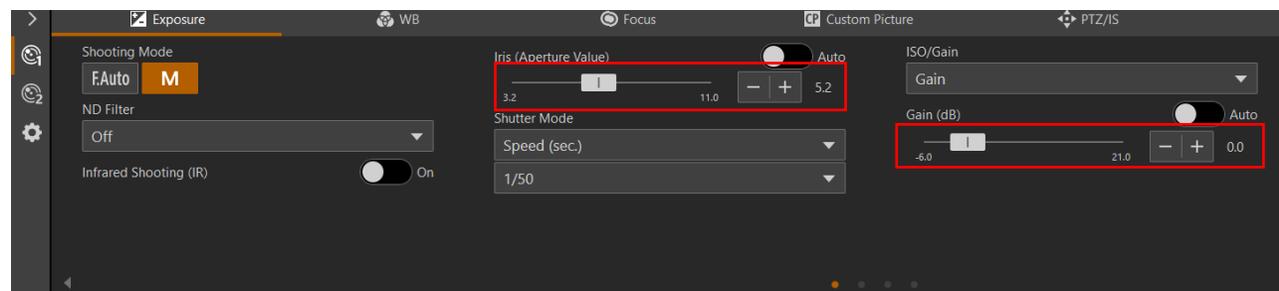
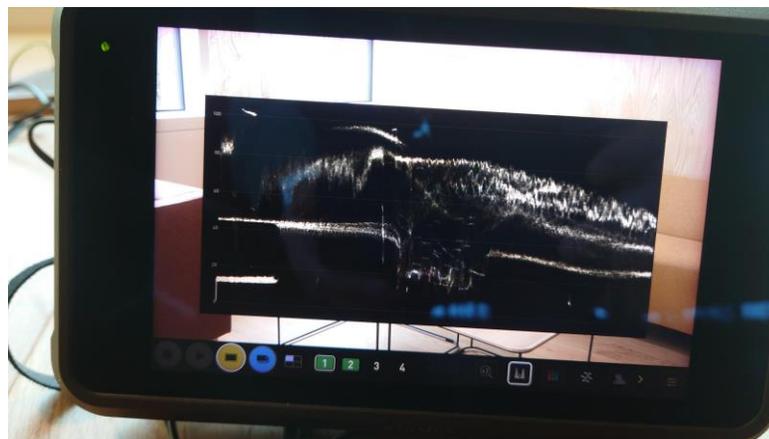


CR-N700

Adjust the exposure value as close as the reference camera using ISO/Gain and Iris.

If your monitor have wave form monitor (WFM), it's useful to visualize the exposure value.

If you don't have WFM, adjust the exposure by naked eye.
The colour matching still works.



Take Stills

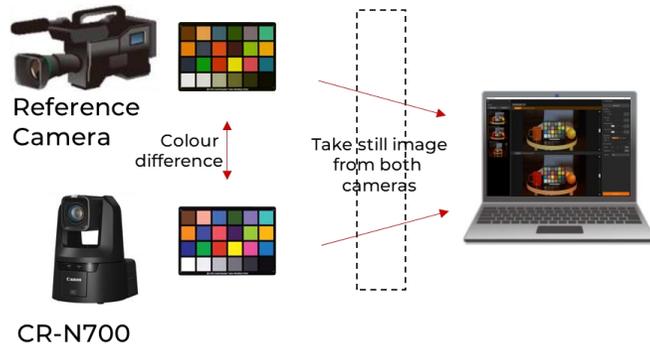
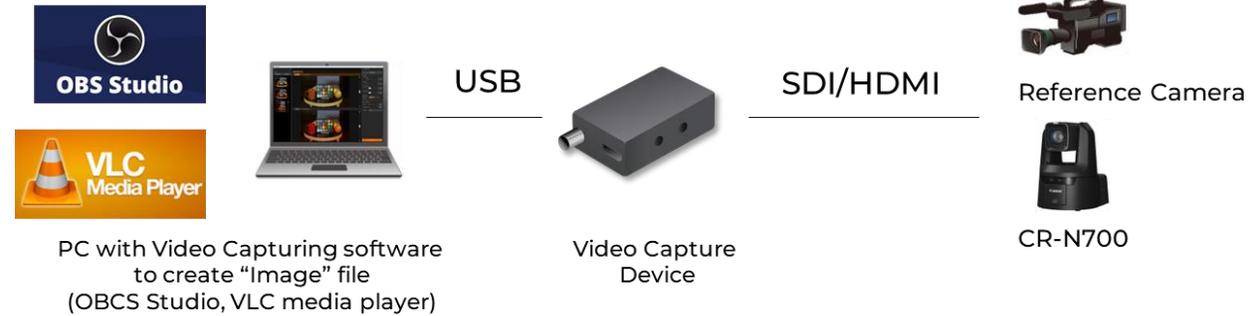
Set camera & chart

Take Stills

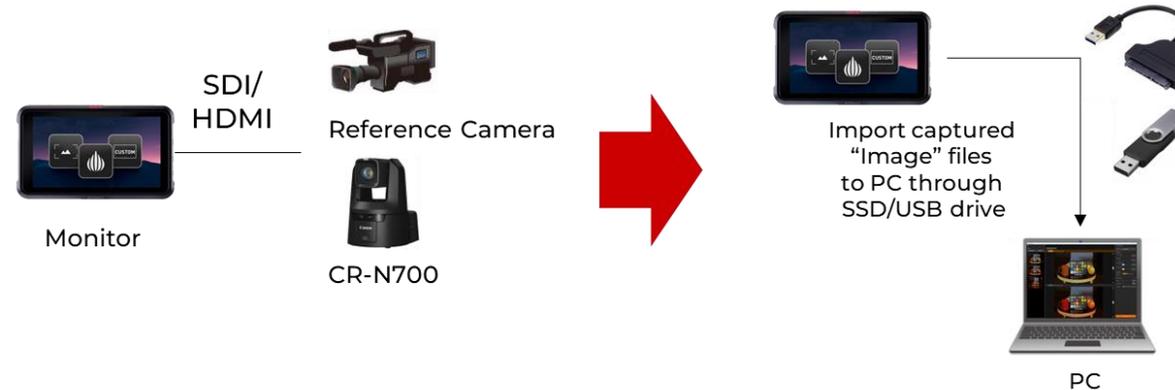
Matching

Take still pictures from Reference Camera and CR-N700. It requires the Colour chart is taken in each pictures.

[1] SDI-> USB capture device



[2] SDI-> Recorder/Monitor to capture SDI image



Any method other than above example works. As long as still image can be captured.

Matching

Set camera & chart

Take Stills

Matching

[Use Colour Matching Software]

1. Import captured images
2. Put “Auto Detection” of colours on both images
3. Generate Look Up Table (LUT)
4. Checking effect of colour matching
5. Apply the LUT to CR-N700

Calculate
Look Up Table
(LUT) to match colour
against reference camera.



Similar
colour



Write LUT via
Ethernet.



Image List

Add Image

Delete All

Show Both Image

R Reference Reference.png



Source CANON_CR-N700.png



Matching Settings

Auto Detect

Patch Settings

Column Count 6

Row Count 4

Reference Rect Size 40

Source Rect Size 62

Color Difference

MaxΔE: --- (Ref. / Source)

AveΔE: ---

Custom Color Picker

Rect Size L M S Add

Element Count 0 / 3 Delete

Importance Low

Generate LUT

Import both images from Reference camera and CR-N700 and push "Auto Detect"



Image List

Add Image

Delete All

Reference.png



CANON_CR-N700.png

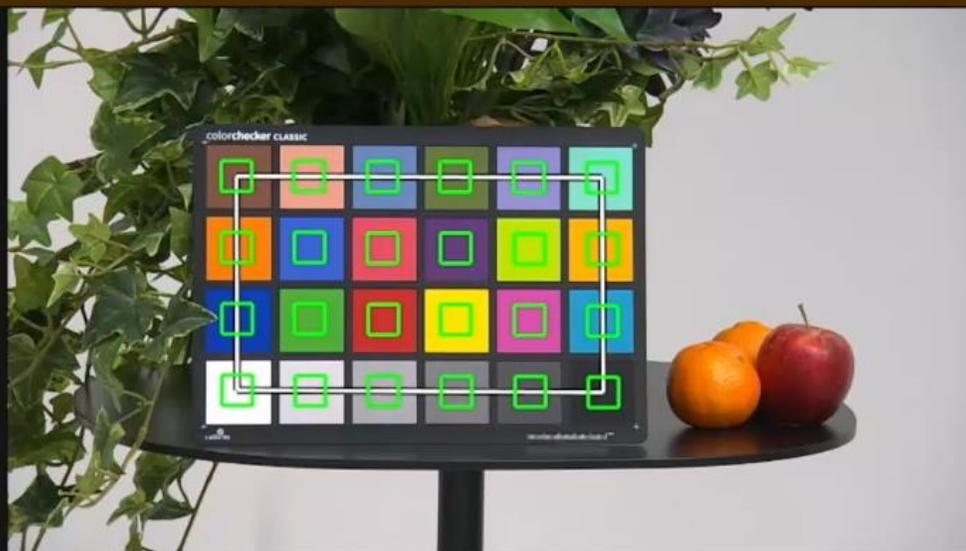


Show Both Image ▾

R

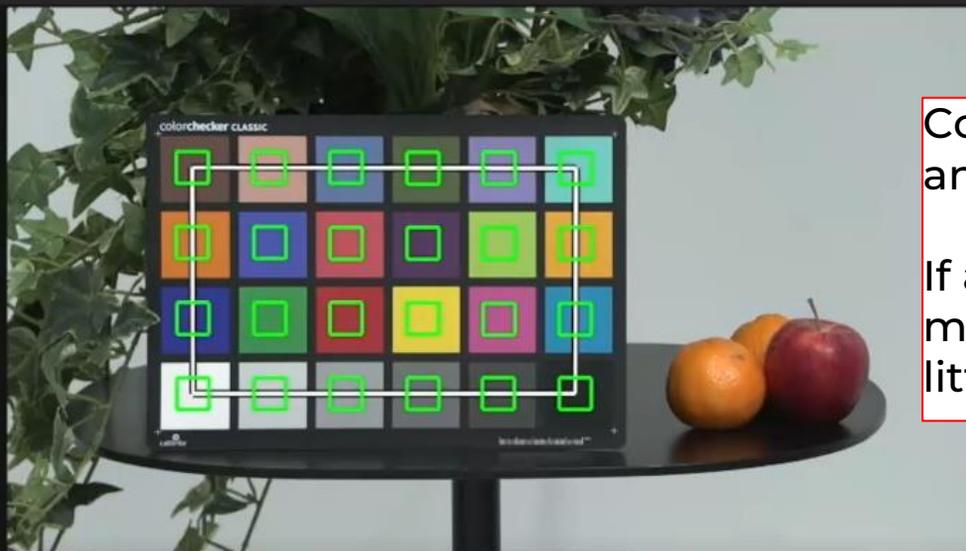
Reference

Reference.png



Source

CANON_CR-N700.png



Matching Settings

Auto Detect

Patch Settings

Column Count



6

-

+

Row Count



4

-

+

Reference Rect Size



40

-

+

Source Rect Size

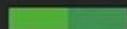


42

-

+

Color Difference

MaxΔE : 12.2  (Ref. / Source)

AveΔE : 8.2

Custom Color Picker

Rect Size L M S

Add

Element Count 0 / 3

Delete

Importance Low

Confirm all colour are correctly detected and push "Generate LUT".

If any of colour are not detected (red marked), you need to zoom in little/change angle to make it.

Generate LUT

Image List

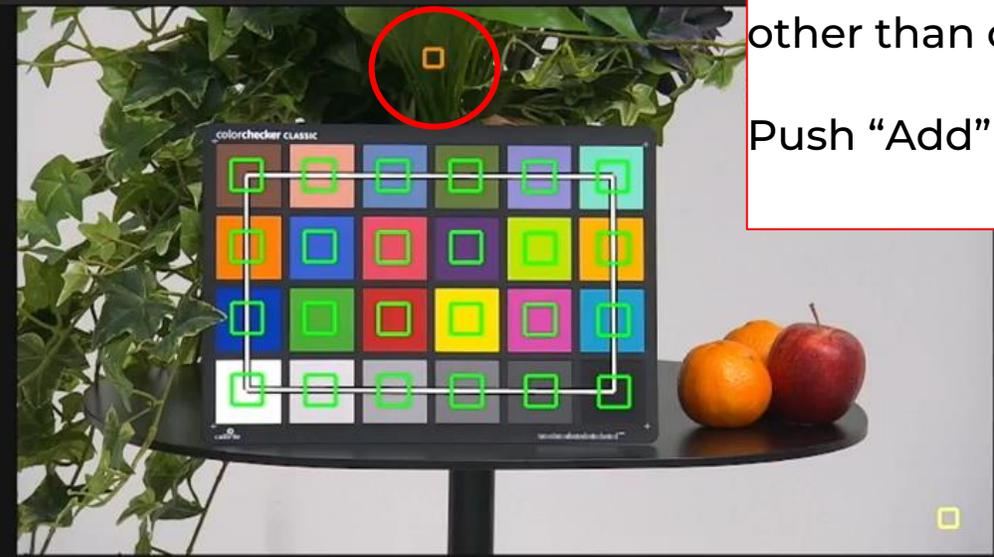
Add Image Delete All

Reference.png

CANON_CR-N700.png

Show Both Image

R Reference Reference.png



Source CANON_CR-N700.png



If you have specific points to match colour more, you can points max 3 points other than colour chart manually.
Push "Add" of Custom Color Picker

Matching Settings

Source Rect Size 40 42

Color Difference
MaxΔE : 12.2 (Ref. / Source)
AveΔE : 8.1

Custom Color Picker
Rect Size L M S Add Delete
Element Count 3 / 3
Importance Low

Generate LUT



REFERENCE
CAMERA

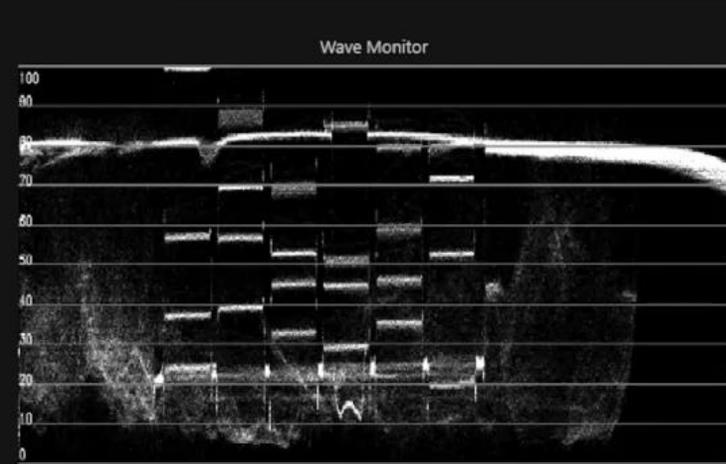
Reference : Reference.png



CANON
CR-N700

AFTER

LUT Apply Source : CANON_CR-N700.png



Wave Monitor

Vector Scope

Wave Monitor : Mode
Y

Vector Scope : Mode
NORMAL

Vector Scope : Scale
x1

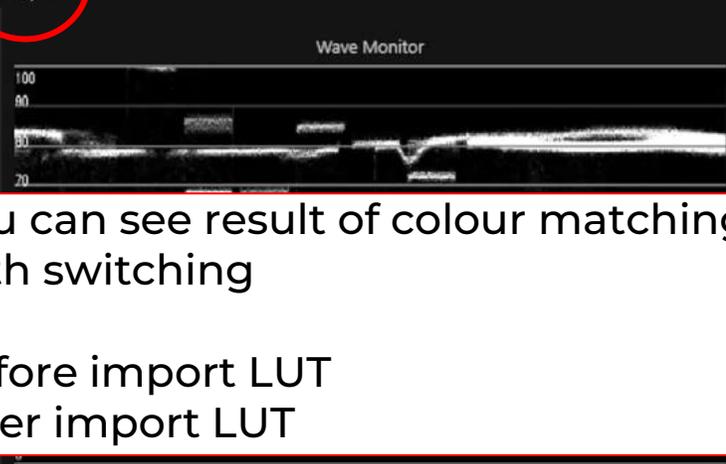
User Check Point S
[Icon]

ΔE : ---

Ref. S

Send LUT

Save LUT



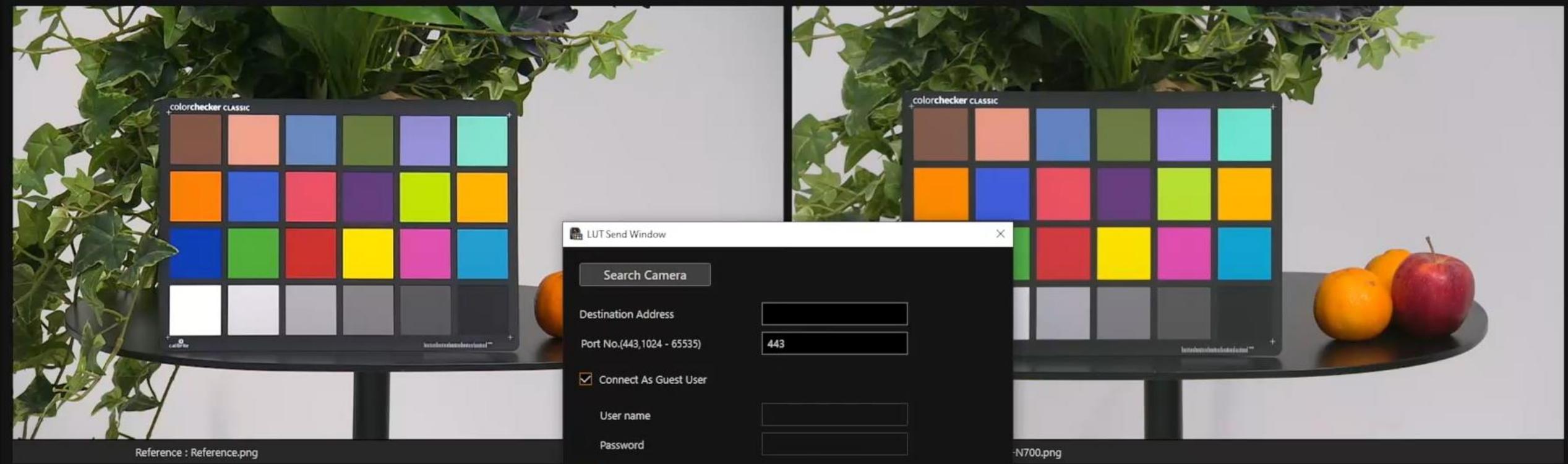
Wave Monitor

Vector Scope

You can see result of colour matching with switching

Before import LUT

After import LUT



LUT Send Window

Search Camera

Destination Address:

Port No.(443,1024 - 65535):

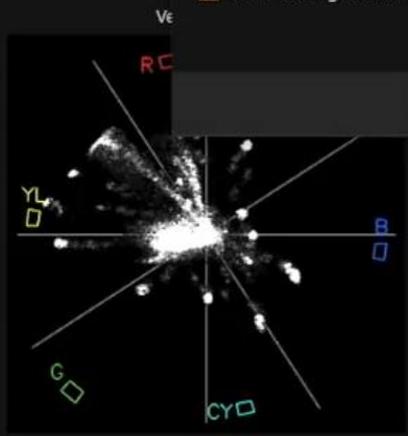
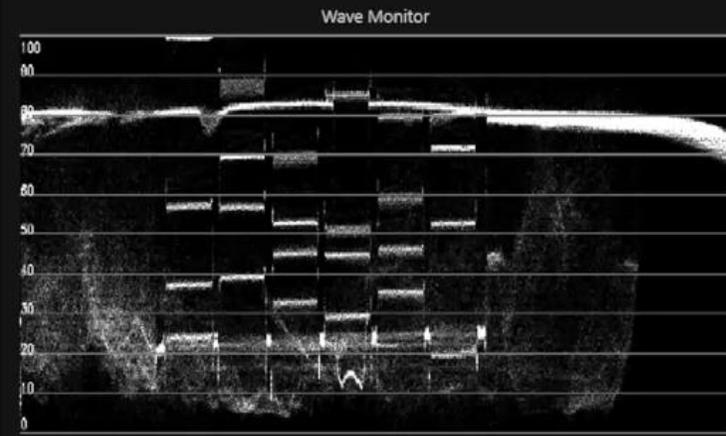
Connect As Guest User

User name:

Password:

Show warnings about non-private communications

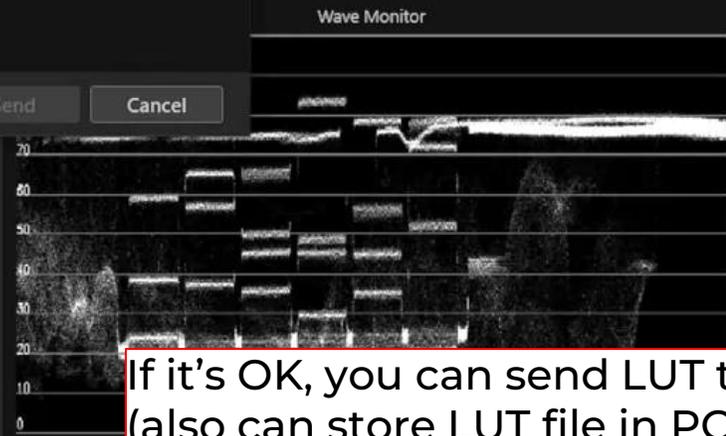
Send Cancel



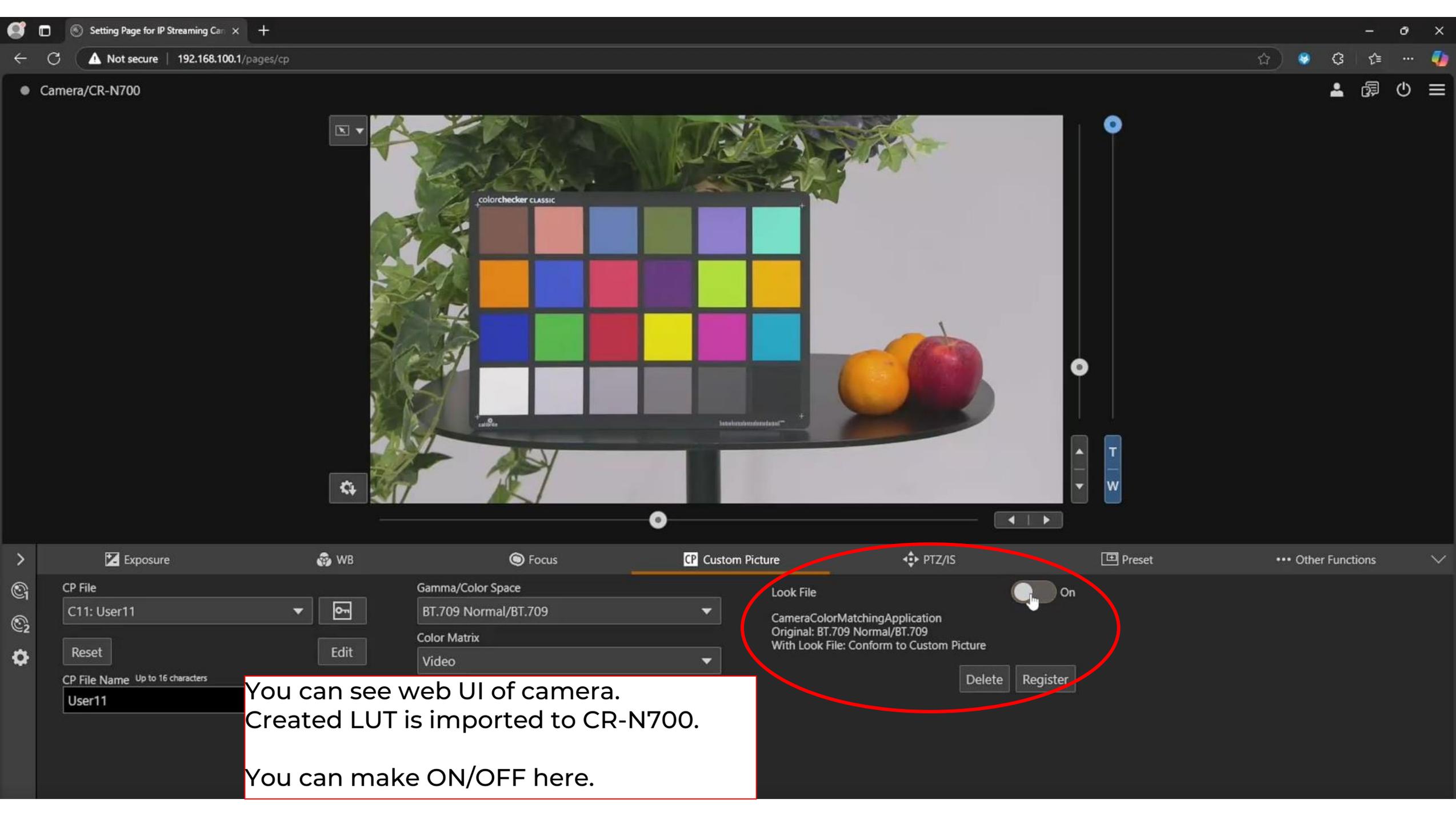
Vector Scope : Scale

x1

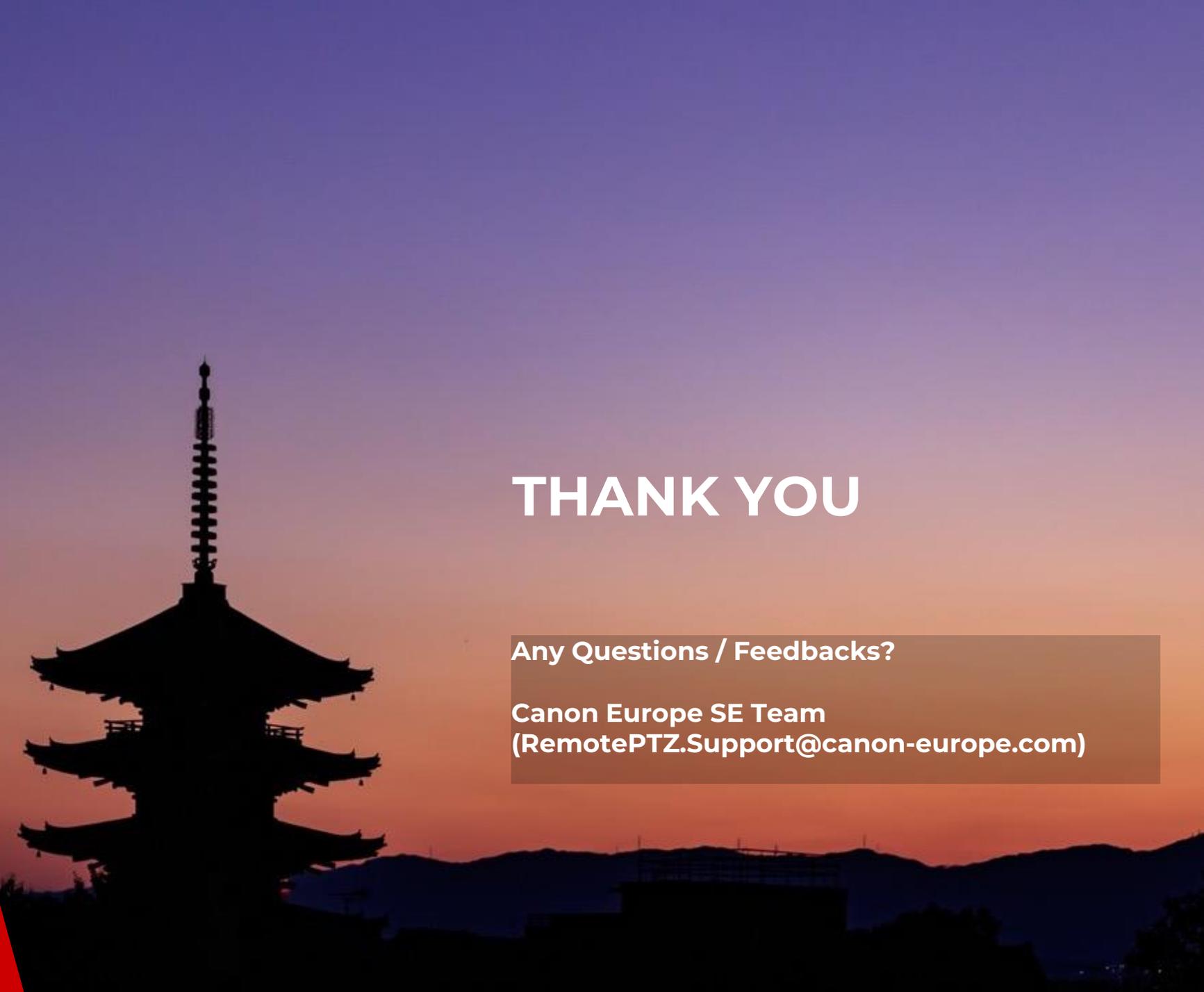
User Check Point Select



If it's OK, you can send LUT to camera.
(also can store LUT file in PC)



You can see web UI of camera.
Created LUT is imported to CR-N700.
You can make ON/OFF here.



Canon

THANK YOU

Any Questions / Feedbacks?

**Canon Europe SE Team
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