Lux Media Plan

CERBERUS 4K

PRODUCT SPECIFICATION & OPERATIONAL MANUAL

CERBERUS
CAMERA SYSTEM

2. Product Outline

CERBERUS 4K is a 4K color camera module utilizing a 1.0" type global shutter CMOS image sensor.
4K UHDTV 60p/59.94p/50p/30p/29.97p/25p/24p/23.98p (3G-SDI×4ch), 1080 60p/59.94p/50p (3G-SDI×1ch), and 1080 60i/59.94i/50i (HD-SDI×1ch) are corresponded.

2.1. Features

- Global shutter type CMOS image sensor
- Lens mount block: 65mm×65mm×12mm, Main block: 29mm×65mm×89mm (without projection).
- GenLock function (3-value analog signals or Black burst)
- Camera can be controlled by RS-232C and RS-422.

2.2. Bundled Items

- Standard Bundled Items
  - Camera module
- Optional Items
  - Mount conversion ring from M42 to C Mount
  - Mount conversion ring from M42 to F Mount

3. Specifications

3.1. General Specifications

Electrical Specifications			
Sensor	Device type	1.0" type global shutter color CMOS sensor	
	Pixel Size	3.45µm(H) × 3.45µm(V)	
Resolution		UHDTV (4ch output) 3840 (H) × 2160(V)	
		1080p (1ch output) 1920(H) × 1080(V)	
Video output format		3840 x2160p YUV422 @60, 59.94, 50 fps (Level A)	3G-SDI ×4 - 2SI / Square Division
		3840 x2160p YUV422 @60, 59.94, 50 fps (Level B)	3G-SDI ×4 - Square Division
		3840 x2160p YUV444 @30, 29.97, 25, 24, 23.98 fps (Level A)	3G-SDI ×4 - 2SI
		1920 x 1080p YUV422 @60, 59.94, 50 fps (Level A / B)	3G-SDI ×1
		1920 x 1080 i YUV422 @60, 59.94, 50 fps	HD-SDI ×1
Sync system		Internal sync. / External sync.	
Sensitivity		F8 (2000 lx)	
Gain variable range		AGC : 0dB ~ +48 dB	
		MANUAL : 0dB ~ +48 dB	
Shutter speed variable range		AUTO/MANUAL : 1/13600s ~ 1/23.98s	
White balance adjustment		AUTO: Standard, Outdoor, Fluorescent	
		MANUAL: Red Gain, Blue Gain, One Push	
		PRESET : Custom(Color temperature settings), Tungsten(3200K), Daylight(5500K), Cloudy(6500K), Shade(8000K)	
Flicker cancellation		ON, OFF	
Edge enhancement		OFF, 1~7	
Color correction		Auto, Standard, Fluorescent Light, Tungsten Lamp	
Color saturation adjustment		0%(B/W) ~ 100% ~ 200%	
Noise reduction		ON, OFF	
Gamma		BT.709 complied curve: Contrast -2, -1, 0, +1, +2 BT.2100(HLG) complied curve	
Dynamic range		Low (Priority to Low noise), Normal, High	
Knee point		OFF, 100%, 95%, 90%, 85%, 80%, 75%	
Color gamut		BT.709, BT.2020	
Master Pedestal		-100 ~ 0 ~ +100	
Pedestal(R,G,B)		RGB -100 ~ 0 ~ +100	

Color Balance	RGB 0 ~ 100 ~ 200
Pixel defect correction (white spot)	Corrected at factory setting.
LTC	OFF, ON External SMPTE Time code can be input into the LTC IN terminal.
Camera preset settings	1, 2, 3, 4 (4 presets can be stored.)
Remote control communications	Camera settings can be set by RS-232C terminal or RS-422 terminal. Or LMP Remote Control Panel
Power requirements	DC +9 ~ +15V / 15W

Mechanical Specifications	
Dimensions	excl. Lens 65 x 65 x 98 mm
Weight	490g
Lens mount	M42 mount / C-Mount adaptor with adjustable back focus

4. Functions

4.1. GenLock

Gen Lock function is available by inputting Analog External Sync signal (Black burst or 3-value SYNC) into the EXT SYNC IN terminal of the 12pins connector. Corresponding external sync signals vary depend on the camera output format. Please refer to the chart below for the details.

CAMERA FORMAT	EXT SYNC IN				
UHD/HD 60p/60i			1080i60	720p60	1080p30
UHD/HD 59.9p/59.9i	NTSC		1080i59.9	720p59.9	1080p29.9
UHD/HD 50p/50i		PAL	1080i50	720p50	1080p25
UHD 30p			1080i60	720p60	1080p30
UHD 29.9p	NTSC		1080i59.9	720p59.9	1080p29.9
UHD 25p		PAL	1080i50	720p50	1080p25
UHD 24p					1080p24
UHD 23.9p					1080p23.9

- Input Black Burst signals for NTSC/PAL signals.
- Input 3-value SYNC signals for other than NTSC/PAL signals.
- EXT SYNC IN is terminated with 75Ω.
- When an external signal specified the above is input, the camera will be in external sync mode automatically.
- When no external signal is input, the camera will operate in internal sync mode.
- Right after external signals are input, images may be disturbed but this is not malfunction.
- When a signal other than the specified above chart is input to the EXT SYNC IN terminal, disturbed image or no image may be shown.
- Right after when the camera was booted or when output format was changed, difference between the video signals and the external sync signals would occur with the maximum differences of ±10 pixels. If this difference (error) cannot be accepted, lock with external sync automatically, then tune it with user adjustment commands.

4.2. LTC (Longitudinal Time Code)

Time code can be inserted to 3G-SDI signal.

External time code can be inserted with inputting LTC code to the LTC IN terminal of the 12pins connector. And, when no signal is input into the LTC IN terminal, camera internal time code can be inserted.
Internal time code starts with 00:00:00:00 when power is turned ON, and when some signals are input into the LTC IN terminal, it will be changed to external time code. With this situation, if no signal is input to the LTC IN terminal, it becomes self-running from the set time code.

Signal format: SMPTE Time code
Signal level: 0.5~2[Vp-p]

5.2. Command List

Video Format

	Address	Setting Value	Initial Value	Description
Video Format	1	0: UHDTV 2-Sample Interleave 60p (Level A) 1: UHDTV 2-Sample Interleave 59.94p (Level A) 2: UHDTV 2-Sample Interleave 50p (Level A) 3: UHDTV Square Division 60p (Level A) 4: UHDTV Square Division 59.94p (Level A) 5: UHDTV Square Division 50p (Level A) 6: Full-HD 60p (Level A) 7: Full-HD 59.94p (Level A) 8: Full-HD 50p (Level A) 9: Full-HD 60p (Level B) 10: Full-HD 59.94p (Level B) 11: Full-HD 50p (Level B) 12: UHDTV Square Division 60p (Level B) 13: UHDTV Square Division 59.94p (Level B) 14: UHDTV Square Division 50p (Level B) 15: Full-HD 60i 16: Full-HD 59.94i 17: Full-HD 50i 18: UHDTV 2-Sample Interleave 30p 444 (Level A) 19: UHDTV 2-Sample Interleave 29.97p 444 (Level A) 20: UHDTV 2-Sample Interleave 25p 444 (Level A) 21: UHDTV 2-Sample Interleave 24p 444 (Level A) 22: UHDTV 2-Sample Interleave 23.98p 444 (Level A)	3	This is to set video output format.


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