

CIS

English

Camera Link I/F
12M Pixels CMOS B/W Camera

VCC-12CL1M

Product Specifications & Operational Manual

CIS Corporation

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1. Scope of Application

This is to describe VCC-12CL1M, 12M resolution, Camera Link B/W CMOS Camera.

All specifications contained herein are subject to change without prior notice. Reproduction in whole or in part is prohibited.

2. Handling Precautions

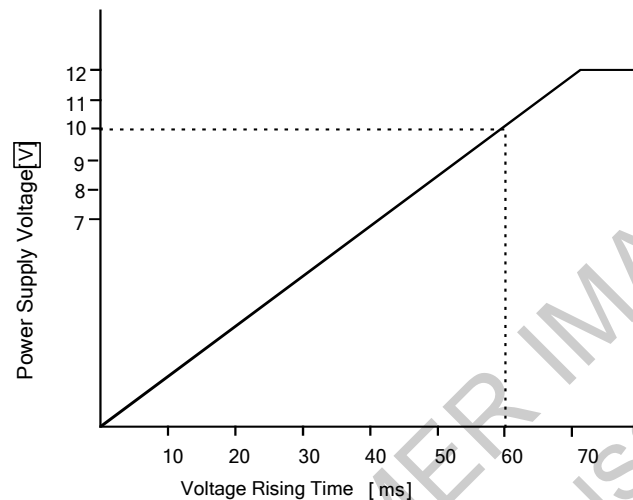
The camera must not be used for any nuclear equipments or aerospace equipments with which mechanical failure or malfunction could result in serious bodily injury or loss of human life. Our warranty does not apply to damages or defects caused by irregular and/or abnormal use of the product.

Please observe all warnings and cautions stated below.

Our warranty does not apply to damages or malfunctions caused by neglecting these precautions.

- Do not use or store the camera in the following extreme conditions:
 - Extremely dusty or humid places.
 - Extremely hot or cold places (operating temperature -5°C to $+45^{\circ}\text{C}$)
 - Close to generators of powerful electromagnetic radiation such as radio or TV transmitters.
 - Places subject to fluorescent light reflections.
 - Places subject to unstable (flickering, etc.) lighting conditions.
 - Places subject to strong vibration.
- Remove dust or dirt on the surface of the lens with a blower.
- Do not apply excessive force or static electricity that could damage the camera.
- Do not shoot direct images that are extremely bright (e.g., light source, sun, etc.), and when camera is not in use, put the lens cap on.
- Follow the instructions in Chapter 6, "External connector pin assignment" for connecting the camera. Improper connection may cause damages not only to the camera but also to the connected devices.
- Confirm the mutual ground potential carefully and then connect the camera to monitors or computers. AC leaks from the connected devices may cause damages or destroy the camera.
- Do not apply excessive voltage. (Use only the specified voltage.) Unstable or improper power supply voltage may cause damages or malfunction of the camera.

- The voltage ripple of camera power DC $+12V \pm 10\%$ shall be within $\pm 50mV$. Improper power supply voltage may cause noises on the video signals.
- The rising time of camera power supply voltage shall be less than $+10V$, Max 60ms. Please avoid noises like chattering when rising.



3. Product Outline

VCC-12CL1M is a Camera Link interfaced and 12M resolution industrial B/W video camera module. 12M pixels CMOS sensor with diagonal length 23.5mm $4/3$ is utilized. Entire pixels can be read out within 1/43s at Full Configuration output.

Features

- ☐ Global shutter CMOS sensor is utilized.
- ☐ Camera Link Medium Configuration 、 Full Configuration、10Tap8Bit and 8Tap10bit Configuration are supported.
- ☐ Fixed trigger shutter mode and pulse width trigger shutter mode are operable.
- ☐ Full frame rates and video output format are as follows.

Medium Configuration Mode	22fps	8bit/10bit/12bit
Full Configuration Mode	43fps	8bit
10Tap 8bit Configuration Mode	54fps	8bit
8Tap 10bit Configuration Mode	43fps	10bit
Factory Settings: Full Configuration(43fps, 8bit)		

- ☐ Binarization
- ☐ Shading correction
- ☐ Free Software
 - CIS control panel software for evaluation purpose only is downloadable via our web.
- ☐ Optional Accessories
 - None

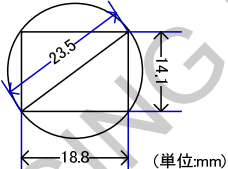
4. Cautions about camera output mode

This camera enable to set Medium/Full/10Tap Configuration mode output with a camera mode and 0~+12dB with a Gain.

However, the ambient temperature etc might cause a fixed noise easily at Medium Configuration and +12dB. Setting a Gain within +6dB at Medium Configuration mode is recommended.

5. Specification

5.1. General Specification

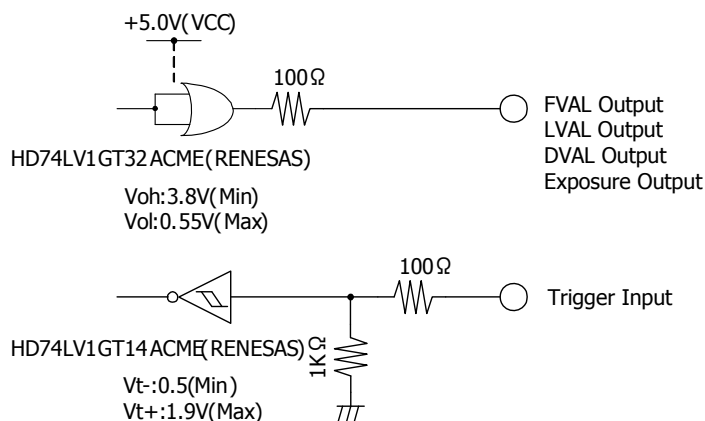
(1) Pickup Device	Device Type Effective number Unit cell size Image circle	Diagonal Length 23.5mm, Global Shutter 4/3 type, B/W CMOS 4000(H) x 3000(V) 4.7 μ m(H) x 4.7 μ m(V) ϕ 23.5mm 
(2) Video Output Frequency	Pixel Clock	72 MHz
	Medium Configuration Mode:	Horizontal frequency: 71.287kHz Horizontal clock 1010 Vertical frequency: 22.58Hz Scanning lines 3156
	Full, 8Tap10Bit Configuration Mode:	Horizontal frequency: 138.461kHz Horizontal clock 520 Vertical frequency: 43.87Hz Scanning lines 3156
	10Tap Configuration Mode:	Horizontal frequency: 173.076kHz Horizontal clock 416 Vertical frequency: 54.84Hz Scanning lines 3156
(3) Sync. System	Internal Sync. System.	
(4) Video Output	Medium Configuration Full Configuration(factory settings) 10Tap8Bit Configuration 8Tap10Bit Configuration	
(5) Resolution	3000 TV Lines	
(6) Output Format	Camera Link output 8bit/10bit/12bit (Fixed to 8bit at 10Tap mode) B/W output	
(7) Sensitivity	F5.6 400lx (at Shutter speed 1/43s (OFF), Gain 0dB, and Full Configuration mode)	
(8) Minimum illumination	F2.8 7.0 lx (at Shutter speed 1/43s (OFF), Gain +12dB, and Full Configuration mode)	
(9) Dust or stains in optical system	No dust or stain shall be detected on the testing screen with setting the camera aperture at F16.	
(10) Power requirements	DC+12V $\pm$ 10% with 12pins circular connector	
(11) Power consumption	6.1W (Full Configuration mode, Full frame scan output): Factory settings 8.0W (10Tap Configuration mode, Partial scan 100 lines output)	
(12) Dimensions	Refer to overall dimension drawing. (H:65mm W:65mm D:50mm excluding projection)	
(13) Weight	Approx. 270g	
(14) Lens mount	M42 Mount * Refer to overall dimension drawing.	
(15) Optical axis accuracy	Refer to drawing for CMOS Optical Axis Accuracy.	
(16) Gain variable range	0dB ~ +12dB (Guaranteed range)	
(17) Shutter speed variable range	OFF ~ 1/34000s (at Trigger mode and 10Tap Configuration)	
(18) Trigger shutter mode	Fixed Shutter Trigger Mode/ Pulse Width Shutter Trigger Mode	
(19) Partial Scan	Full frame scan ~2 lines(2 lines/step)	
(20) Safety/Quality standards	UL: Conform to UL Standard including materials and others. CE: EN55022:2010(ClassA) for Emission EN61000-6-2:2005 for Immunity RoHS: Conform to RoHS.	
(21) Durability	Vibration	Acceleration : 98m/s ² (10G) Frequency : 20~200 Hz Direction : X,Y, and Z 3 directions Testing time : 120min for each direction
	Shock	No malfunction shall be occurred with 980m/s ² (100G) for $\pm$ X, $\pm$ Y, and $\pm$ Z, 6 directions. (without package)

(22) Operation environment	Temperature	Performance guaranteed temperature: -5°C~+40°C Camera operation guaranteed temperature: -5°C~+45°C ※ All the specifications specified in this manual is guaranteed under performance guaranteed temperature. ※All the camera functions operate normally under operation guaranteed temperature.
	Humidity	RH 20~80% with no condensation.
(23) Storage Environment	Temperature	-25°C~+60°C
	Humidity	RH 20~80% with no condensation.

5.2. Camera Output Signal Specification

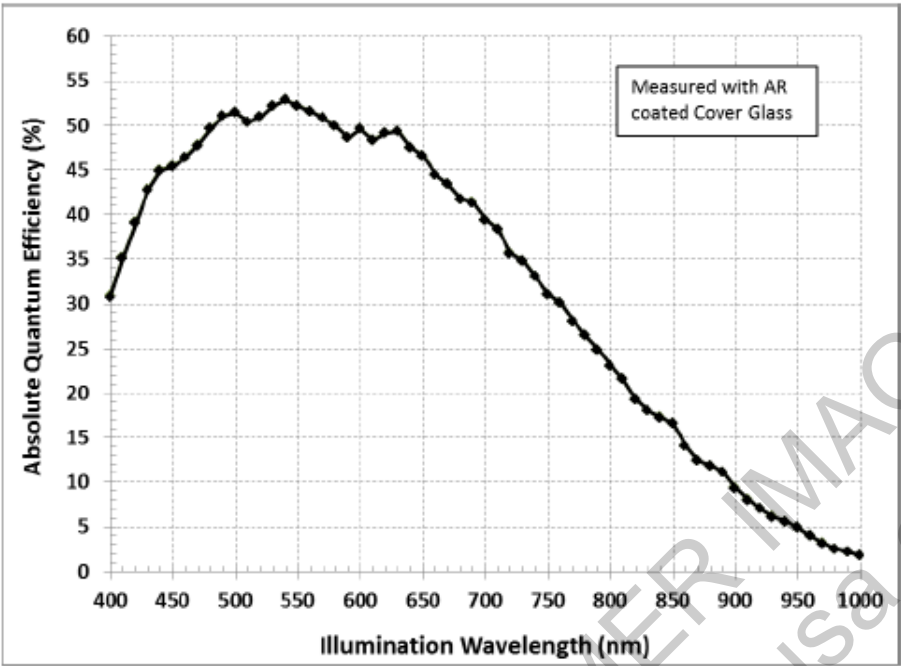
(1) Video output data	Effective Video Output	4000(H) × 3000(V)	At full frame scan mode
(2) Sync. Signal output	LVAL :Pin No.6 FVAL :Pin No.7 DVAL :Pin No.10 EXPOSURE :Pin No.9	12pins Circular Connector (LVTTTL Output)	
	LVAL FVAL DVAL SP	Camera Link output (LVDS):	Exposure pulse
(3) Trigger Input	Polarity	Positive/Negative (selectable)	Polarity is selectable at Address 11
	Pulse Width	Approx. 14HD (min.) ~ Approx. 2 frames •Medium Configuration Mode Min. 66.7us •Full , 8Tap10bit Configuration Mode Min. 33.3us •10Tap Configuration Mode Min. 29.4us Functionally, no upper limitation is set but noises such as dark noises and shadings might be noticeable at long time exposure.	
	Trigger Input Select :CC1 : Pin No.11	Camera Link input (LVDS) 12pin circular connector (LVTTTL)	
(4) Serial Communication	SerTC (Serial to Camera)	Camera Link input (LVDS)	
	SerTFG (Serial to Frame Grabber)	Camera Link output (LVDS)	
(5) Video Signals	White Clip Level	At Digital 8bit : FFh	
	Setup Level	At Digital 8bit : 01±01h (Condition: Gain 0dB)	
	Dark Shading	At Digital 8bit : Both horizontal and vertical should be under ±04h.(Condition: Gain 0dB)	

※ 3 seconds shall be waited after turning on power to get proper camera operation.



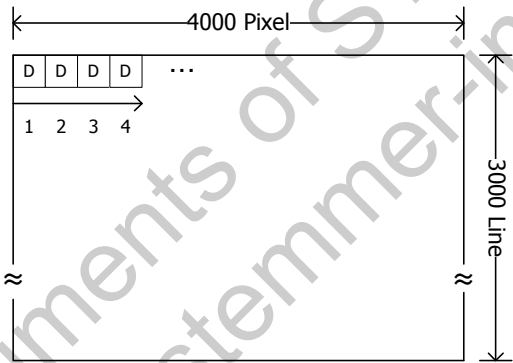
5.3 spectral sensitivity characteristic

※the lens characteristic and the illuminant characteristic are excluded.

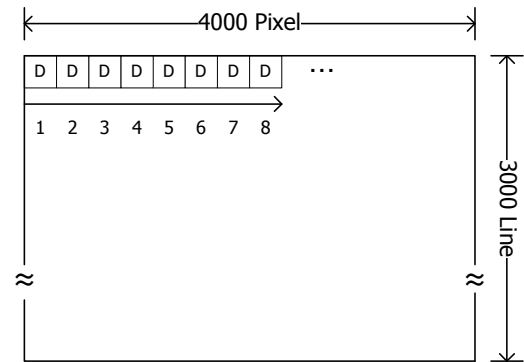


5.4 Video Output Format

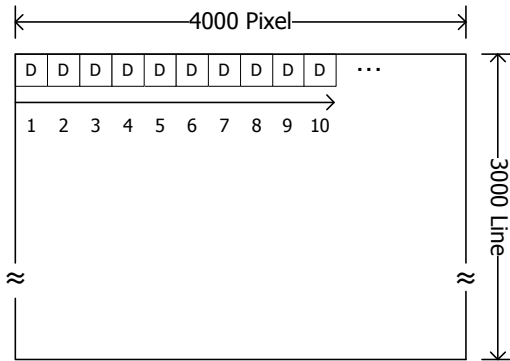
(1) Medium Configuration Mode : 22fps



(2) Full , 8Tap10Bit Configuration Mode : 43fps (Factory settings)



(3) 10Tap Configuration Mode : 54fps



6. Function Settings

(Camera functions can be set with serial communications.)

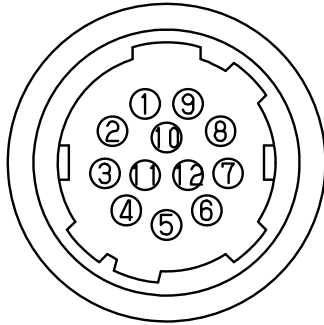
Function	Address	Data
Gain	1	0: 0 dB : Fixed Gain 1: + 6 dB : Fixed Gain 2: + 1 dB : Fixed Gain 2 4 Manual Gain: 0~+12dB (Refer to Address 5) 5: AGC
Shutter Normal Shutter Mode Preset value differs between at Trigger OFF and at Fixed Trigger Mode	2	Normal Shutter Mode (Trigger OFF) Medium Configuration Full , 8Tap10Bit 10Tap Configuration Mode Configuration Mode Mode 0: 1/22s(OFF) 1/43s(OFF) 1/54s(OFF) 1: 1/60s 1/60s 1/60s 2: 1/100s 1/100s 1/100s 3: 1/120s 1/120s 1/120s 4: 1/150s 1/150s 1/150s 5: 1/200s 1/200s 1/200s 6: 1/250s 1/250s 1/250s 7: 1/500s 1/500s 1/500s 8: 1/1000s 1/1000s 1/1000s 9: 1/2000s 1/2000s 1/2000s 10: 1/5000s 1/5000s 1/5000s 11: 1/10000s 1/10000s 1/10000s 12: 1/18000s 1/20000s 1/15000s 13: 1/35000s 1/35000s 1/25000s 14: 1/35000s 1/70000s 1/40000s 15: 1/35000s 1/70000s 1/85000s Fixed Trigger Shutter Mode Medium Full , 8Tap10Bit 10Tap Configuration Configuration Configuration Mode Mode Mode 0: 1/22s(OFF) 1/43s(OFF) 1/54s(OFF) 1: 1/60s 1/60s 1/60s 2: 1/100s 1/100s 1/100s 3: 1/120s 1/120s 1/120s

		4: 1/150s 1/150s 1/150s 5: 1/200s 1/200s 1/200s 6: 1/250s 1/250s 1/250s 7: 1/500s 1/500s 1/500s 8: 1/1000s 1/1000s 1/1000s 9: 1/2000s 1/2000s 1/2000s 10: 1/5000s 1/5000s 1/5000s 11: 1/10000s 1/10000s 1/10000s 12: 1/15000s 1/15000s 1/15000s 13: 1/15000s 1/20000s 1/20000s 14: 1/15000s 1/30000s 1/30000s 15: 1/15000s 1/30000s 1/34000s 16: Manual Shutter (Refer to Address 9) 17: AE
Trigger Shutter Mode	4	0: Normal Shutter Mode (Trigger OFF) 1: Fixed Trigger Shutter Mode (Shutter speed can be set with address 2.) 2: Pulse Width Trigger Shutter Mode (Shutter speed can be set with trigger pulse width.)
Manual Gain	5	0~511: 0:0dB ~511:+12dB
Manual Shutter	9	2~3000: 2 Line/Step Normal Medium Configuration Mode: Shutter Mode Shutter Speed = 14.028us (1HD) x setting value min.value 2: 28.1us, max.value 3000:42.1ms Full , 8Tap10Bit Configuration Mode: Shutter Speed = 7.222us (1HD) x setting value min.value 2: 14.4us, max.value 3000:21.7ms 10Tap Configuration Mode: Shutter Speed = 5.778us(1HD) x setting value min.value 2: 11.6us, max.value 3000:17.3ms The minimum value at Fixed Trigger Shutter Mode is set to 14, and the shutter speed at that time comes to the fastest value of the address 2. ex:Min. exposure time at 10Tap Configuration: (14 - 9) × 1H = 28.89us ※Set the data of Address 2 to 16
Targeting AE Level	10	0~100: Targeting level at AGC and AE ON 0~100%
Trigger Polarity	11	0: Positive 1: Negative
Trigger Input	12	0: Camera Link (CC1) Input 1: 12pin Connector(11pin) Input
Output Data Selection	13	0: 8bit Output 1: 10bit output (10bit cannot be output at 10Tap Full Configuration mode.) 2: 12bit output (12bit cannot be output at 8Tap/10Tap mode)
Reflection of partial scan setting value	14	1: Check a setting error of each partial scan area and execute the partial scan without error.
Partial Scan Mode	15	0: Full Frame Scan Mode 1: Partial Scan Mode

Function	Address	Data
Vertical flip	20	0: OFF 1: ON
Horizontal flip	21	0: OFF 1: ON
Gamma correction	23	0: OFF (1.0) 1: ON (0.45)
Binarization	24	0: OFF 1: ON (Standard) 2: ON (Barcode) 3: ON (manual threshold setting)
Threshold value of binarization	25	0~1023: Threshold value of binarization (10bit)
Shading correction	26	0: OFF 1: ON
Start calculation of shading correction data	27	1: Start calculating the shading correction data
Correction of defective pixels	30	0: OFF 1: ON
Camera Mode	31	1: Medium Configuration Mode (22fps) 2: Full , 8Tap10Bit Configuration Mode(43fps) 3: 10Tap Configuration Mode(54fps)
Cursor display ON/OFF	32	0: OFF 1: ON
Cursor X Address	33	0~3999: 0~3999 Horizontal 4000 pixels
Cursor Y Address	35	0~2999: 0~2999 Vertical 3000 lines
Partial Scan Start Position 1	40	0~2998:
Partial Scan Start Position 2	41	0~2998:
Partial Scan Start Position 3	42	0~2998:
Partial Scan Start Position 4	43	0~2998: ※Set the data of Address 15 to 1. ※Odd setting is not acceptable
Partial Scan Effective lines 1	44	2~3000:
Partial Scan Effective lines 2	45	2~3000: Set 0 when not in use.
Partial Scan Effective lines 3	46	2~3000: Set 0 when not in use.
Partial Scan Effective lines 4	47	2~3000: Set 0 when not in use. ※Set the data of Address 15 to 1. ※Odd setting is not acceptable
Baud rate	61	0: 9600bps (factory-configurable) 1: 115200bps (factory-configurable)
Factory Settings	62	Input 68 to set back to factory settings.
Data Save	63	Input 83 to save the data to EEP-ROM.

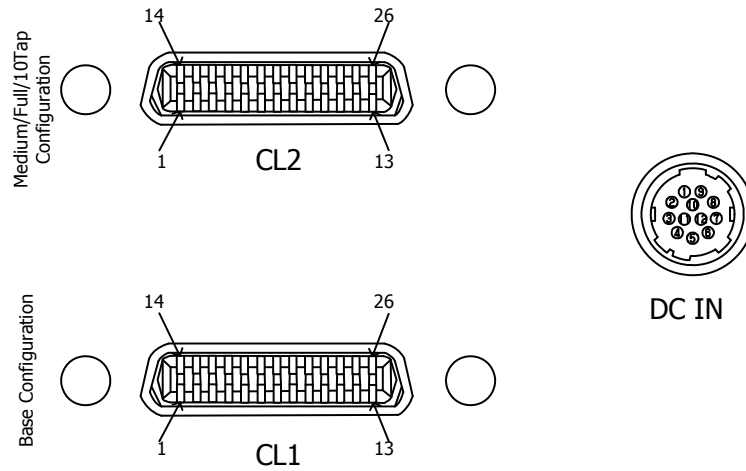
7. External Connector Pin Assignment

7.1. 12 pins Circular Connector HR10-10R-12PA (HIROSE) equivalent



Pin No.	
1	GND
2	Power Input (DC+12V)
3	GND
4	GND
5	GND
6	LVAL Output
7	FVAL Output
8	GND
9	EXPOSURE Output
10	DVAL Output
11	Trigger Input
12	GND

7.2. Camera Link Connector 12226-1100-00PL (SUMITOMO 3M)



Connector (CL1)

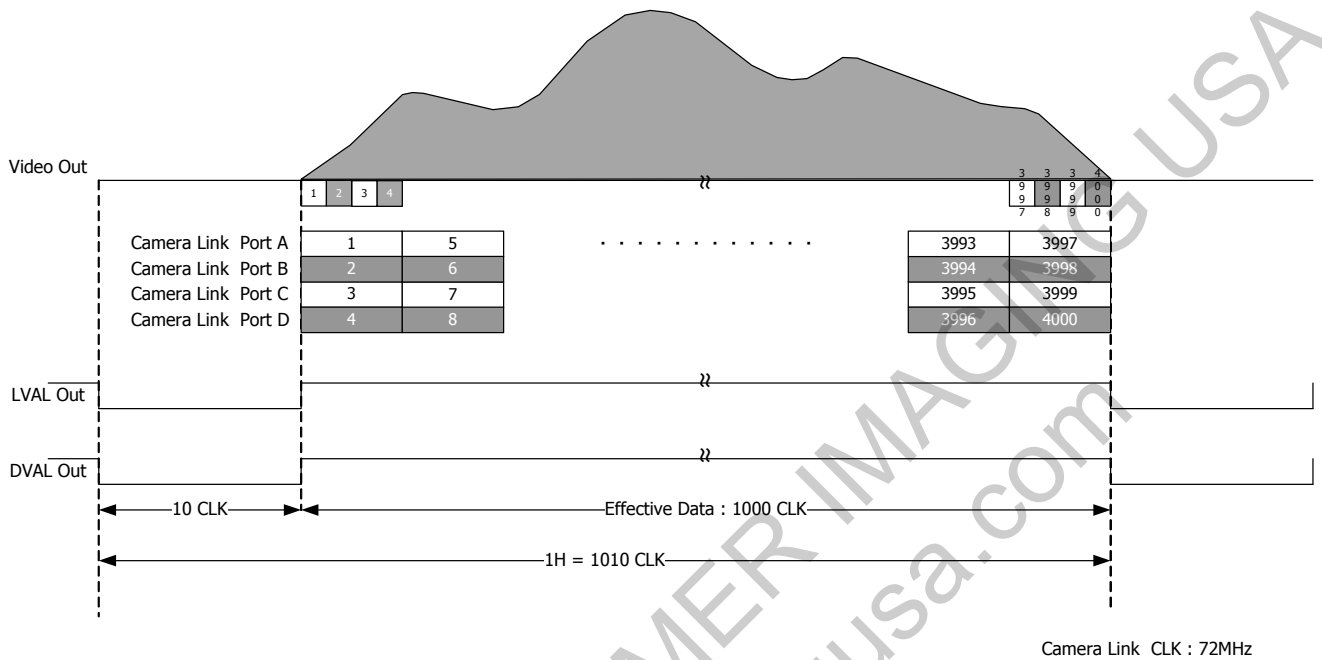
Pin No.		Pin No.	
1	GND	14	GND
2	X0-	15	X0+
3	X1-	16	X1+
4	X2-	17	X2+
5	Xclk-	18	Xclk+
6	X3-	19	X3+
7	SerTC+	20	SerTC-
8	SerTFG-	21	SerTFG+
9	CC1- (Trigger IN -)	22	CC1+ (Trigger IN +)
10	100 Ω	23	Terminated
11	100 Ω	24	Terminated
12	100 Ω	25	Terminated
13	GND	26	GND

Connector (CL2)

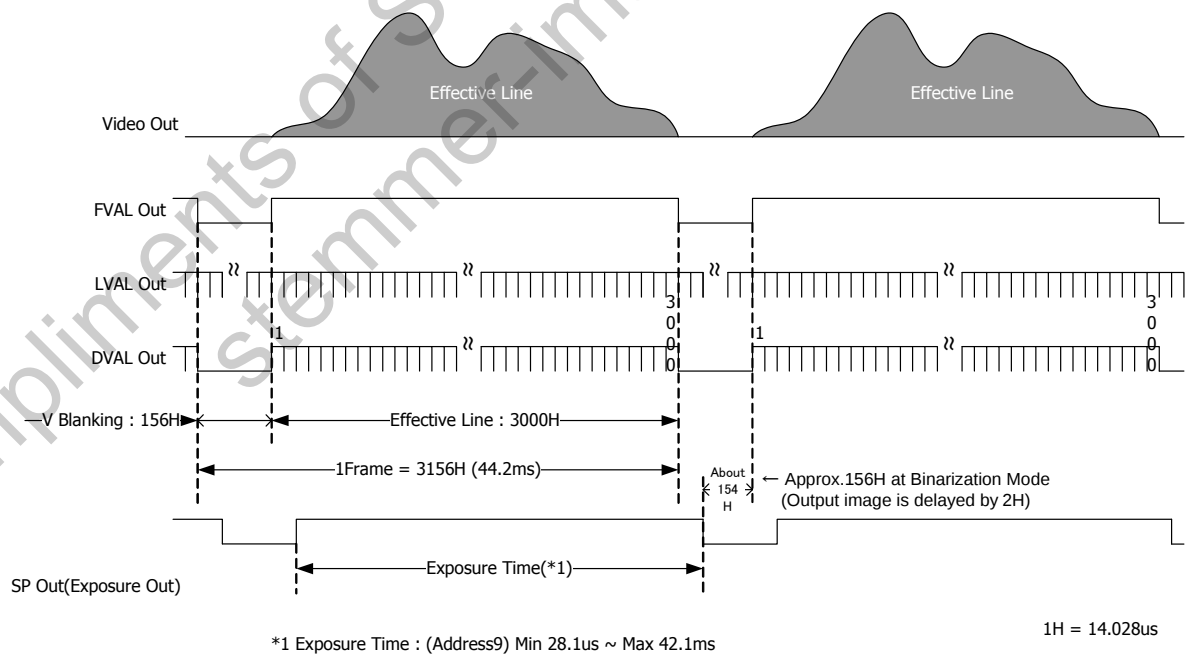
Pin No.		Pin No.	
1	NC	14	GND
2	Y0-	15	Y0+
3	Y1-	16	Y1+
4	Y2-	17	Y2+
5	Yclk-	18	Yclk+
6	Y3-	19	Y3+
7	100 Ω	20	Terminated
8	Z0-	21	Z0+
9	Z1-	22	Z1+
10	Z2-	23	Z2+
11	Zclk-	24	Zclk+
12	Z3-	25	Z3+
13	GND	26	NC

8. Timing Chart

8.1. Horizontal Synchronous Signals Timing (Medium Configuration Mode : 22fps) *Factory settings

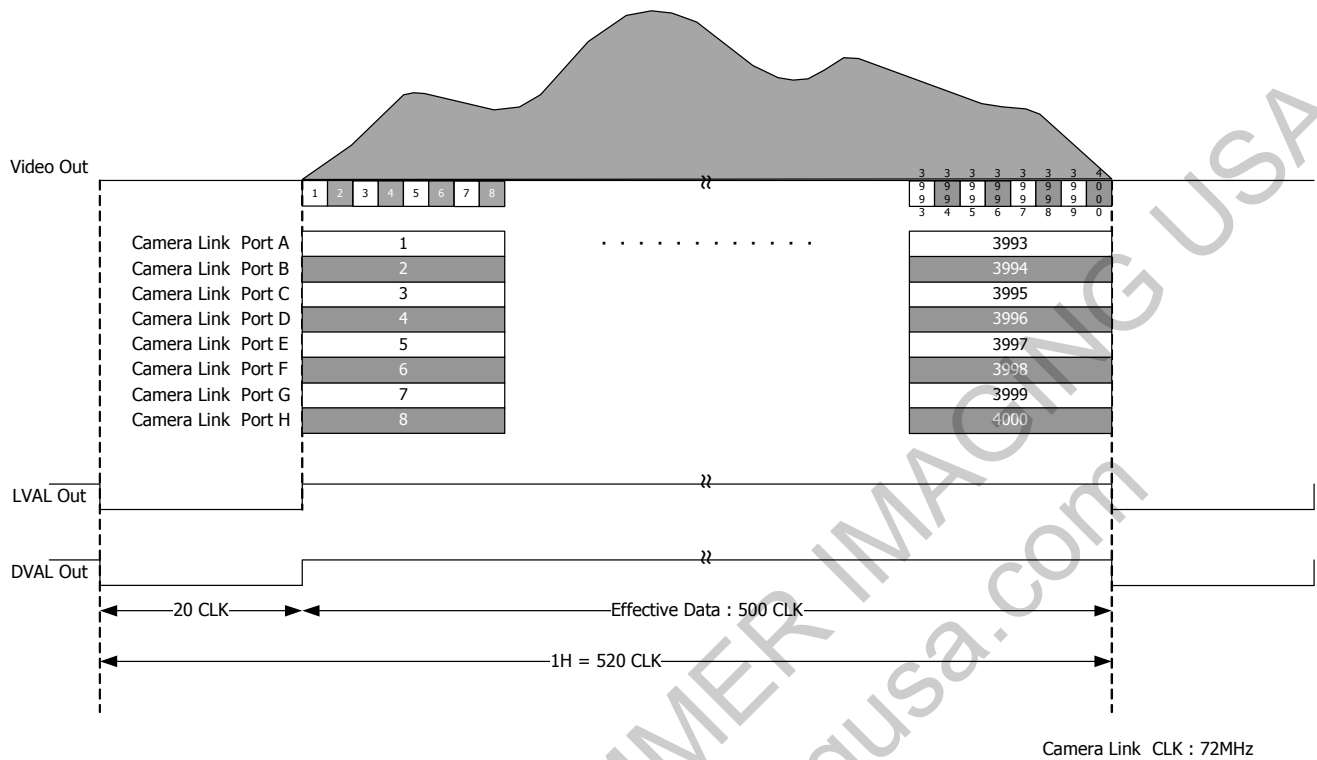


8.2. Vertical Synchronous Signals Timing (Medium Configuration Mode : 22fps)

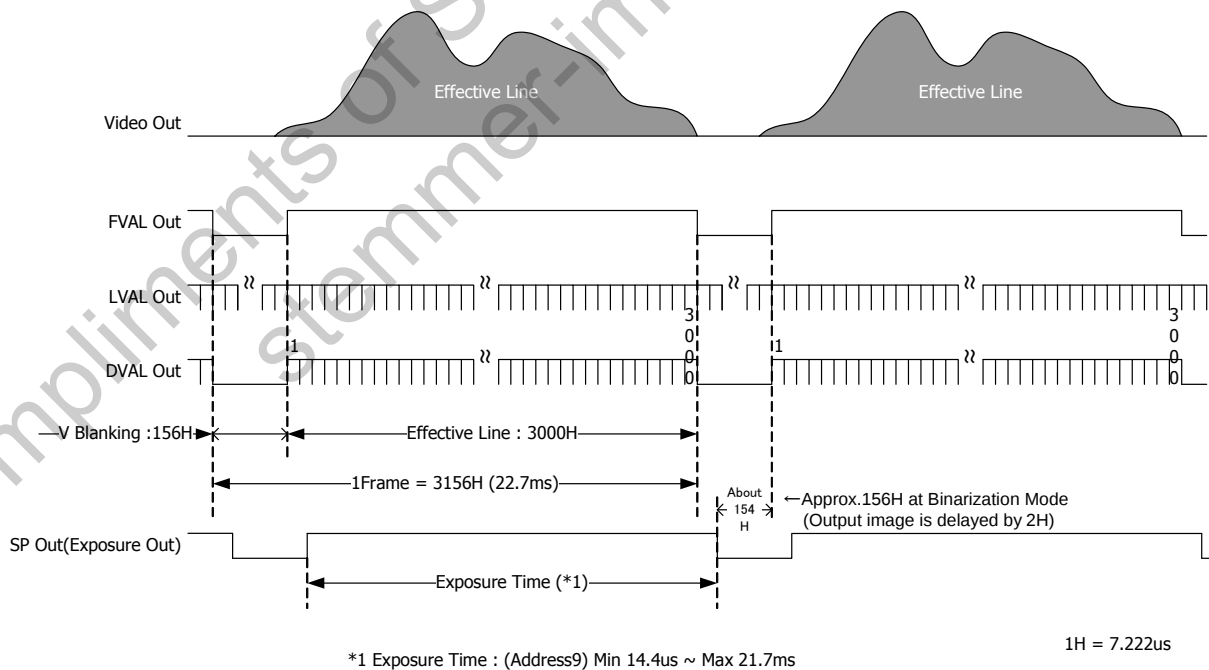


4Tap Medium Configuration Output 22.6fps ㊦㊦

8.3. Horizontal Synchronous Signals Timing (Full , 8Tap10Bit Configuration Mode : 43fps)

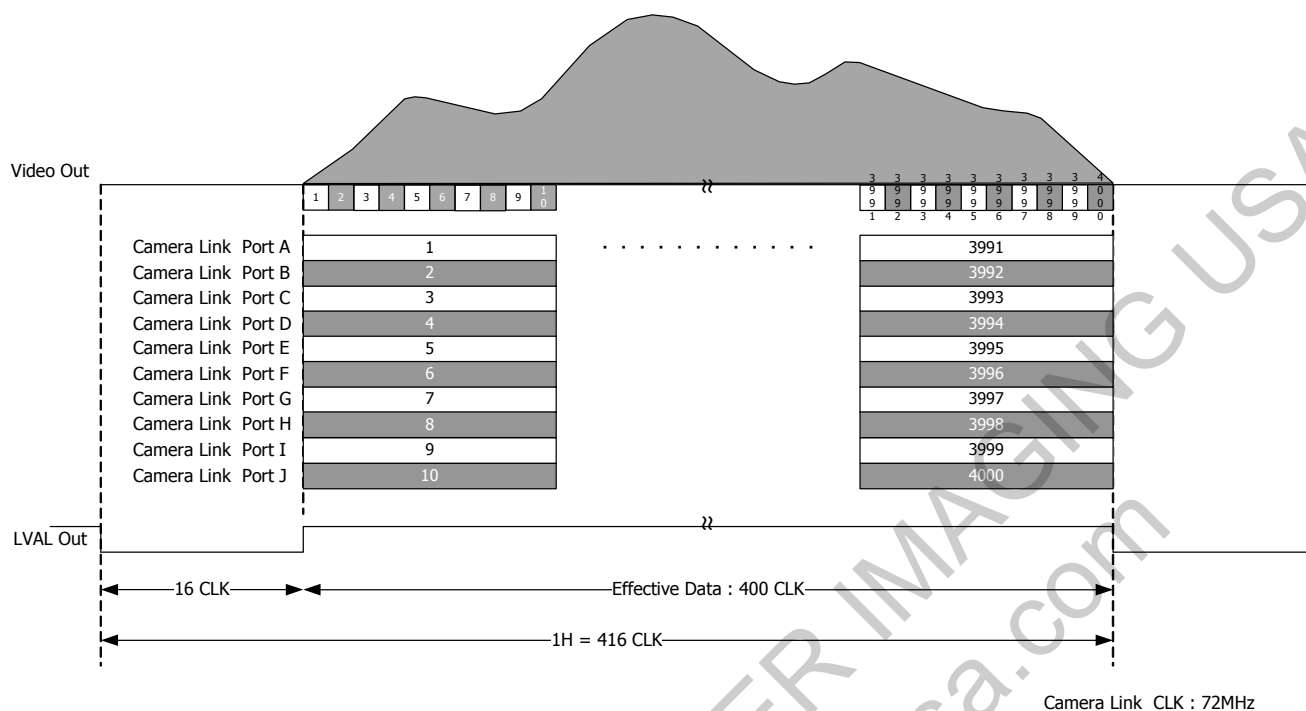


8.4. Vertical Synchronous Signals Timing (Full , 8Tap10Bit Configuration Mode : 43fps)

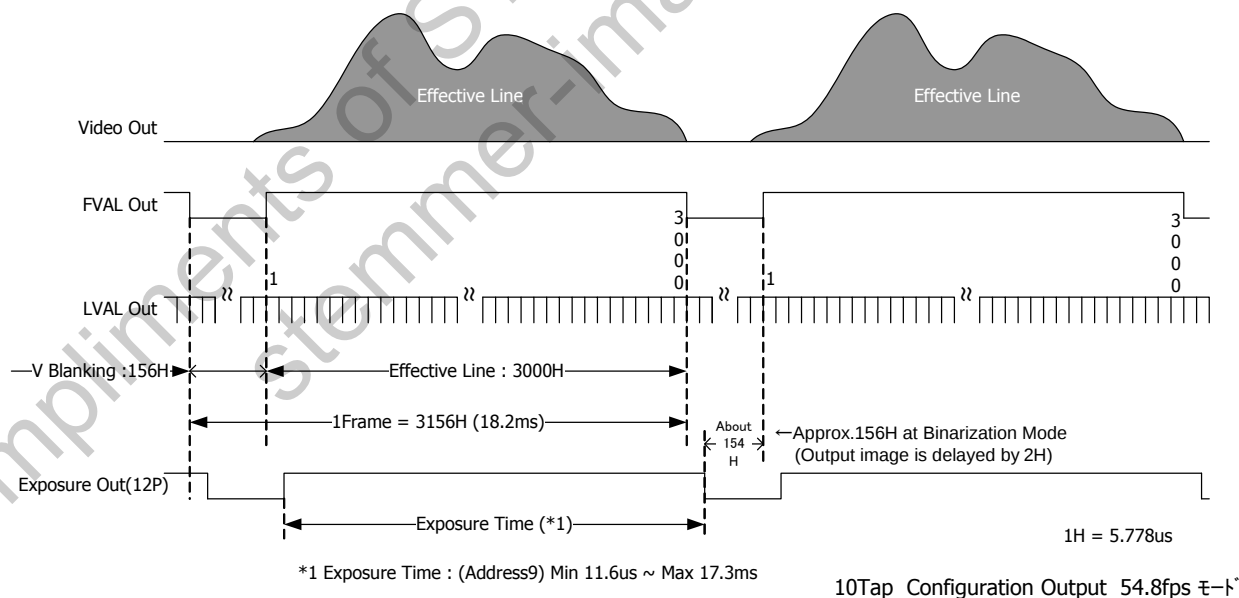


8Tap Full Configuration Output 43.9fps ㊦

8.5. Horizontal Synchronous Signals Timing (10Tap Configuration Mode : 54fps)



8.6. Vertical Synchronous Signals Timing (10Tap Configuration Mode : 54fps)



8.7. Fixed Trigger Shutter Mode

- This is the mode to start exposure with external input trigger signals, and set the exposure time with serial commands.

- Trigger operation is Clock-sync and H/V-sync Restart system. The delay time (Exposure Time Delay) from detecting trigger edge in the camera to starting exposure is as follows.

Medium Configuration Mode	Approx. 170us
Full , 8Tap10Bit Configuration Mode	Approx. 90us
10Tap Configuration Mode	Approx. 72us

- The minimum settable value in this mode is 14.

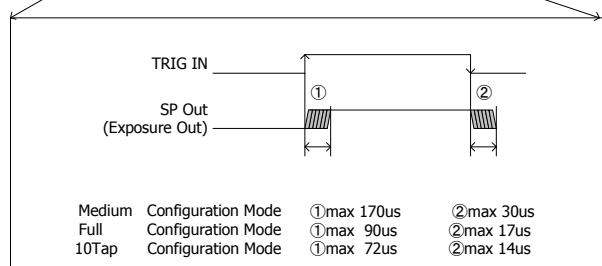
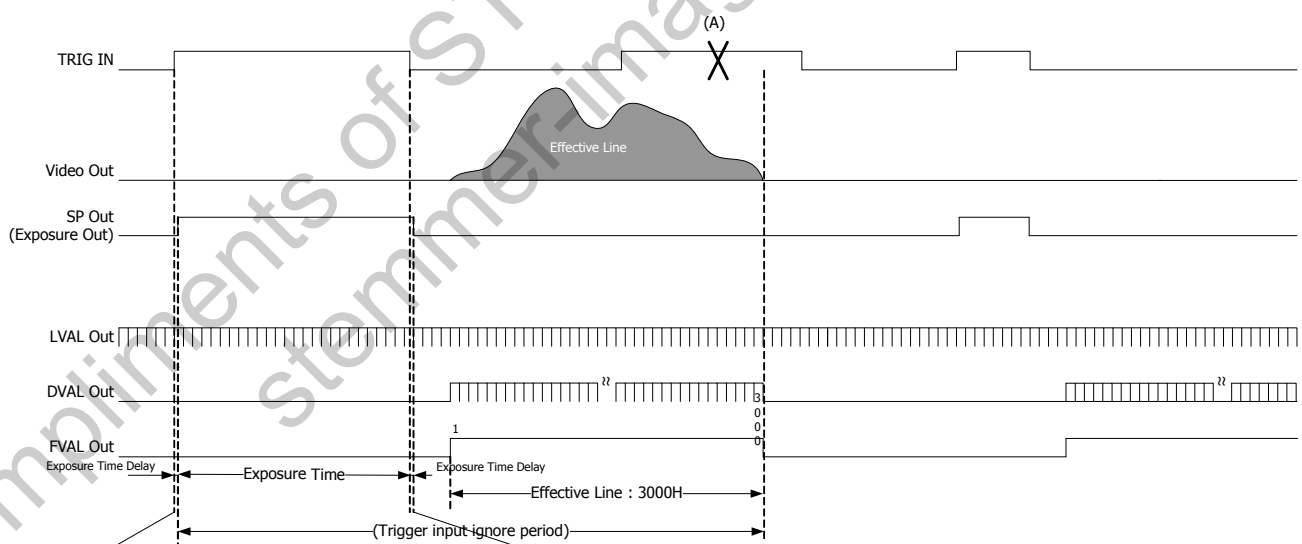
Medium Configuration Mode	Approx. 1/15000s
Full , 8Tap10Bit Configuration Mode	Approx. 1/30000s
10Tap Configuration Mode	Approx. 1/34000s

- Triggers cannot be accepted during the Exposure Time and Outputting images. *Refer to (A) in the drawing below.

- The exposure time is (Shutter setting value – 9 <fixed value>) x 1HD.

- When you switch between Full Frame Scan Mode and Partial Scan Mode or when you change Partial setting, the first output image is subject to be unstable.

*Input the first as dummy trigger and use the trigger from the second onward as actual video signal.



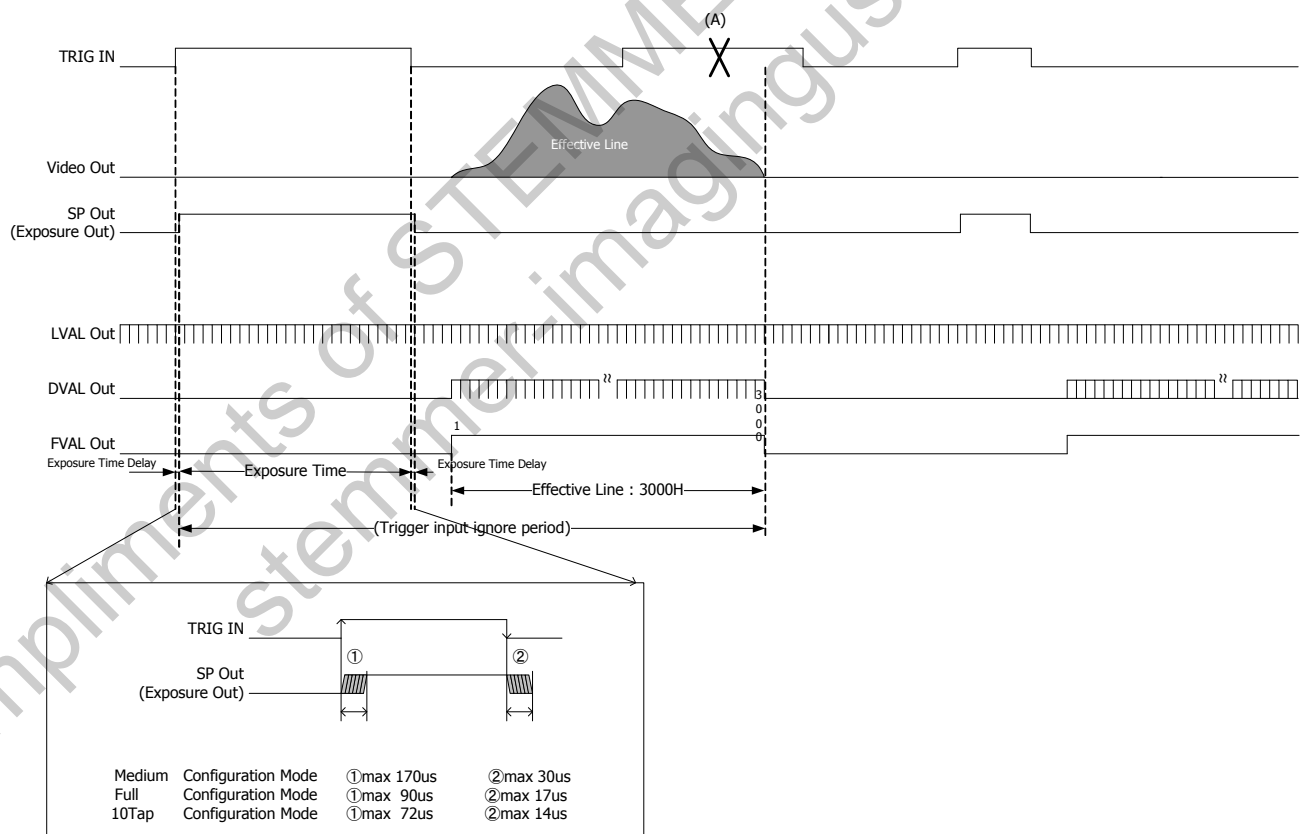
8.8. Pulse Width Trigger Shutter Mode

- This is the mode to start exposure with external input trigger signals, and set the exposure time with pulse width of the trigger signals.
- Trigger operation is Clock-sync and H/V-sync Restart system. The delay time (Exposure Time Delay) from detecting trigger edge in the camera to starting exposure is as follows.

Medium Configuration Mode	Approx. 170us
Full , 8Tap10Bit Configuration Mode	Approx. 90us
10Tap Configuration Mode	Approx. 72us

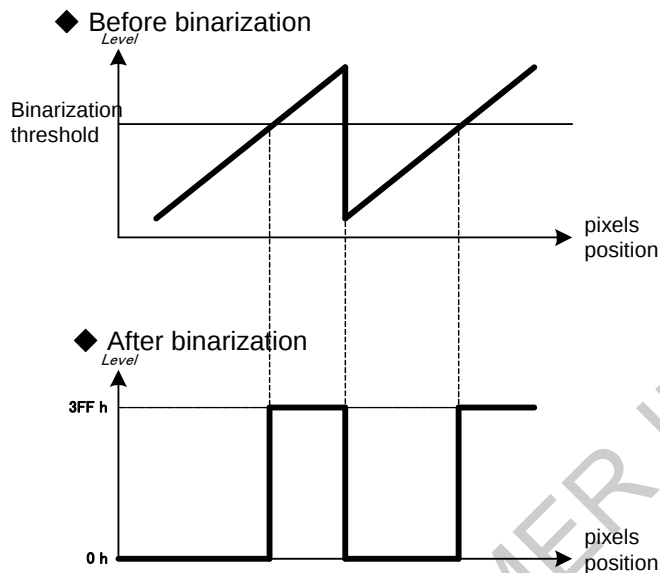
- Pulse width is min. 14HD to approx. 2 frames. Functionally, there is no upper limitation, but noises such as dark noises shadings may be noticeable at long time exposure.
- Triggers cannot be accepted during the Exposure Time and Outputting images.
- When you switch between Full Frame Scan Mode and Partial Scan Mode or when you change Partial setting, the first output image is subject to be unstable.

*Input the first as dummy trigger and use the trigger from the second onward as actual video signal.



9. Binarization

Camera output level can be binarized. When the brightness is low against the binarization threshold value, the signal level of 0h is output. When the brightness is high, the signal level of 3FFh is output. (The value is at 10bit output mode.)



9.1. Binarization Threshold Value Mode

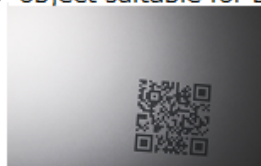
The below 3 types of binarization threshold value modes are selectable.

- Standard ... Based on the brightness distribution of image, the threshold value is calculated automatically inside a camera.
 - ※ Set a parameter of binarization threshold value (address 25) to 512d
- Barcode ... Based on the brightness distribution of edge areas in image, the threshold value is calculated automatically inside a camera.

The object which has a lot of edges such as barcode and character can be binarized with less influences of the fluctuation in flat areas and/or backgrounds. (Refer to the below drawing)

 - ※ Not effective when there is only horizontal edge.
 - ※ Set a parameter of binarization threshold value to 512d.
- Manual ... Based on a parameter of binarization threshold value, the binarization is performed.

◆ object suitable for barcode mode

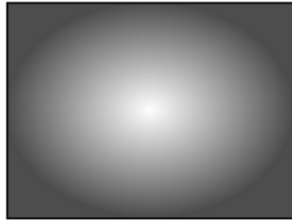


10. Shading Correction

It is a function which corrects the fall of peripheral brightness resulting from a lens etc.

After setting a shading correction data in advance, the correction is performed by setting ON a shading correction (address 26).

◆ before shading correction



◆ after shading correction



10.1. Calculating shading correction data

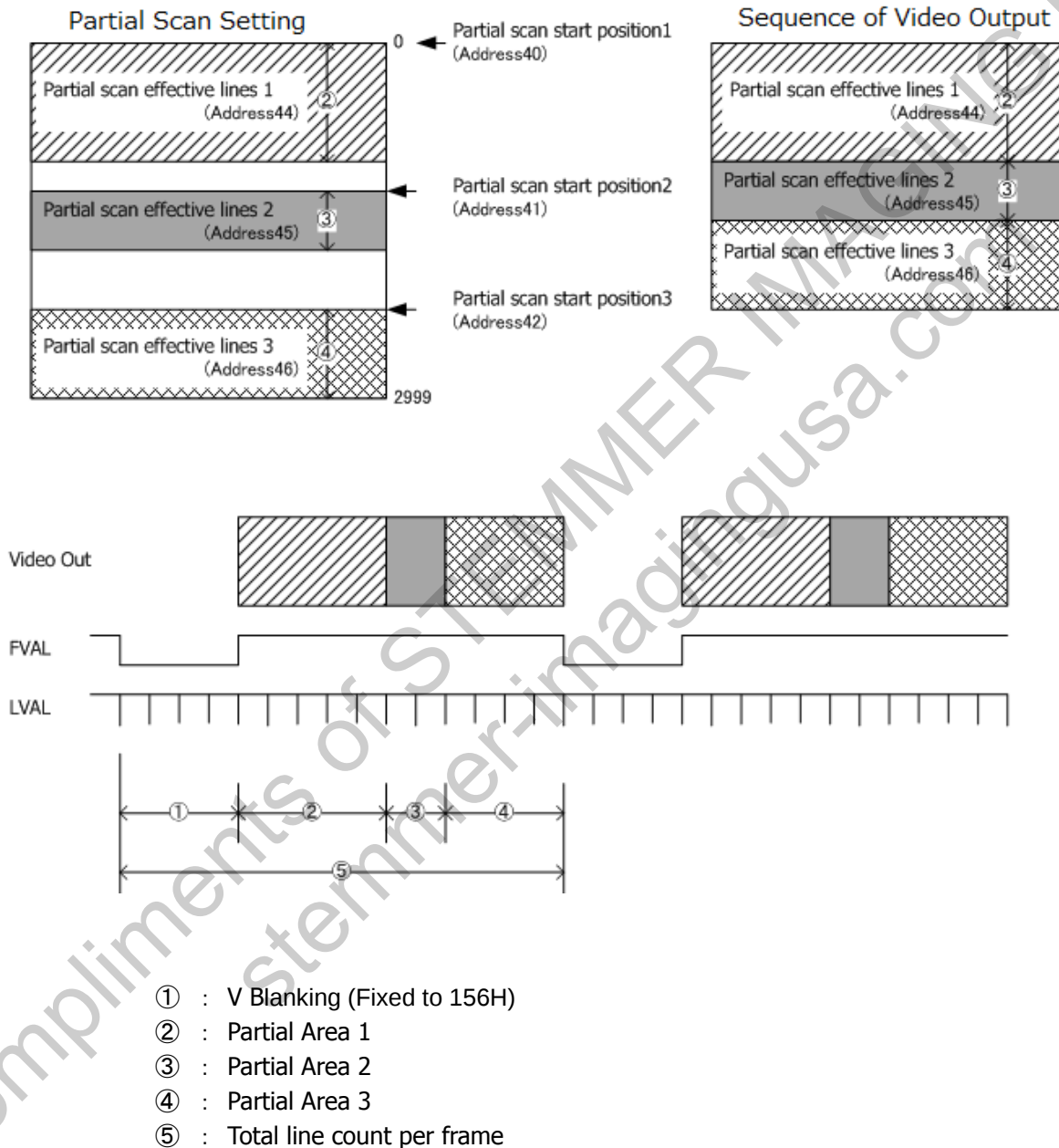
When the object with uniform levels, such as a pattern box, is imaged on the whole screen and a shading correction data calculation start (address 27) is set ON, the correction data is calculated inside a camera automatically and saved.

Start the shading correction data setting at full frame scan mode.

11. Partial Scan Mode

- Maximum 4 partial areas can be set by serial commands.

Example : 3 partial areas to be set.



- ☐ When setting several partial scan areas, please set the start position and effective lines trying not to overlap the areas.
- ☐ When setting several areas, please set the areas in the numerical order of start position.
- ☐ Total line count per frame = **V blanking lines** (fixed to 156H) +

Partial effective lines 1 + Partial effective lines 2 + ... + Partial effective lines 4

Note that Sum total of partial effective line numbers (except V blanking lines) has to be less than or equal to 3000.

- ☐ Frame rate = 1 / (Total line count per frame x Time for 1 line)

Time for 1 line

Camera Mode	Time for 1 Line
Medium Configuration Mode	14.028us
Full , 8Tap10Bit Configuration Mode	7.222us
10Tap Configuration Mode	5.778us

☐ Setting Examples

	Effective Lines	Entire frame lines	Frame Rate (Entire frame lines)		
			Medium Configuration Mode	Full , 8Tap10Bit Configuration Mode	10Tap Configuration Mode
2(Min.)	2 H	158H	451fps	876fps	1095fps
.	.	.	.	.	.
Vertical:VGA equivalent	480 H	636H	112fps	217fps	272fps
.	.	.	.	.	.
Vertical:XGA equivalent	768 H	940H	75fps	147fps	184fps
.	.	.	.	.	.
Vertical:SXGA equivalent	1024 H	1180H	60fps	117fps	146fps
.	.	.	.	.	.
Vertical:UXGA equivalent	1200 H	1356H	52fps	102fps	127fps
.	.	.	.	.	.
3000 (Max:Full Frame)	3000 H	3156H	22fps	43fps	54fps

- ☐ The line numbers at partial scan setting can be set from 2 lines.
- ☐ At partial scan setting, the gain(AGC) and the shutter(AE) turn to be OFF
- ☐ The effective line numbers of the manual shutter setting value at partial scan setting become the maximum.

- ☐ At partial scan setting, the gamma correction, the binarization and the shading correction turn to be OFF.
- ☐ At partial scan setting, the coordinates of a cursor are set to (0, 0).
- ☐ When you switch between Full Frame Scan Mode and Partial Scan Mode or when you change Partial setting, the setting may not be reflected as for the initial image after the change.

*Especially at fixed trigger shutter mode and pulse width trigger shutter mode, input the first as dummy trigger and use the trigger from the second onward as actual video signal.

12. Remote Communication Function

Via camera link cable, the camera can be controlled.

(1) The settings for RS232C

Baud rate	: 9600bps / 115200bps
Data	: 8bit
Stop bit	: 1bit
Parity	: None
XON/XOFF	: Not controlled

* Either of Baud rates is settable as factory setting.

(2) Control code

- The total control code conforms to ASCII code.
- A control code consists of command, parameter and CR (0x0d). The change and acquisition of setting parameters can be done by issuing commands from PC.

Command	Parameter 1	Parameter 2	Function
GU	Address	None	Obtain a setting information
SU	Address	Data	Change a camera setting

As for the address and the data, please refer to "5. Function settings".

(3) How to set a command

- Input a command in capital letters
 - Separate between a command and a parameter by one space.
 - From the head of input character to the linefeed code (CR) is analyzed as one command.
 - Input a remote controller data and a remote controller address by decimal.
- (Do not input the alphabet or decimal fraction)
- Refer to "6. Function settings" for address and data
 - Do not input values and letters other than the above command and those mentioned in "6. Function settings"

CR(0x0d)

Input CR(0x0d) at the end to recognize the last of a command

(4) Factory settings

Input data 68 into the address 62 to return to the factory settings. (Data is not saved to EEPROM at this moment.)

(5) Data Save

Input data 83 into the address 63 to save the data to EEP-ROM.

(6) Setting examples

1. To set a shutter to AE

SU 2 17

2. To check a shutter setting

GU 2

(7) Responding from a camera

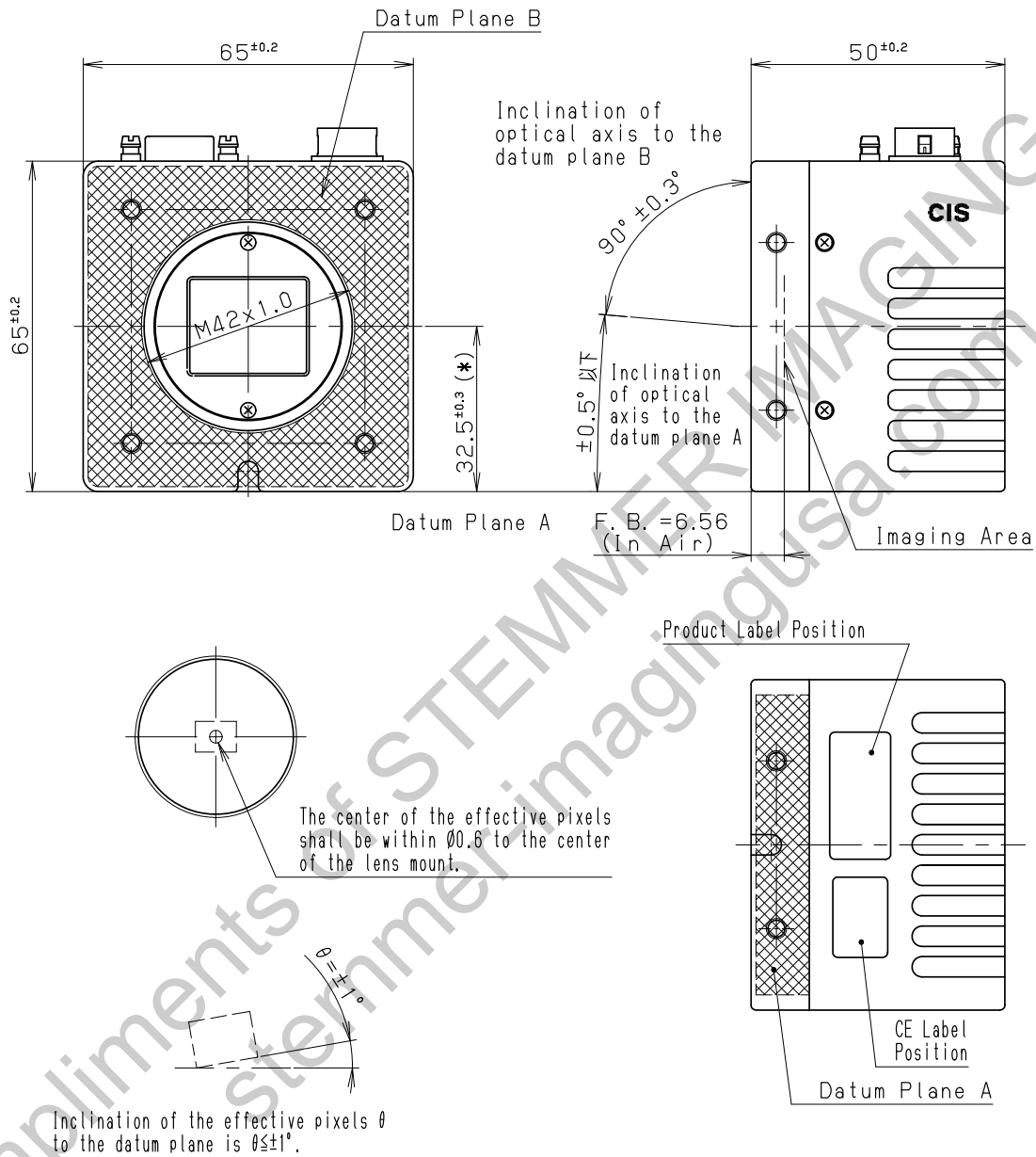
Linefeed Code from a camera is CR(0x0d)LF(0x0a).

This camera utilizes μ T-Kernel source code in accordance with μ T-License of T-Engine forum (www.t-engine.org).

13. Factory Settings

Function	Address	Data
Gain	1	0: 0dB
Shutter	2	0: 1/43s(OFF)
Trigger Shutter Mode	4	0: Normal Shutter Mode (Trigger OFF)
Trigger Polarity	11	0: Positive
Trigger Input	12	0: Camera Link(CC1) Input
Output Data Selection	13	0: 8bit Output
Partial Scan Mode	15	0: Full Frame Scan Mode
Vertical Flip	20	0: OFF
Horizontal Flip	21	0: OFF
Gamma Correction	23	0: OFF
Binarization	24	0: OFF
Shading Correction	26	0: OFF
Defective Pixel Correction	30	1: ON
Camera Mode	31	2: Full Configuration Mode

14. CMOS Optical Axis Accuracy

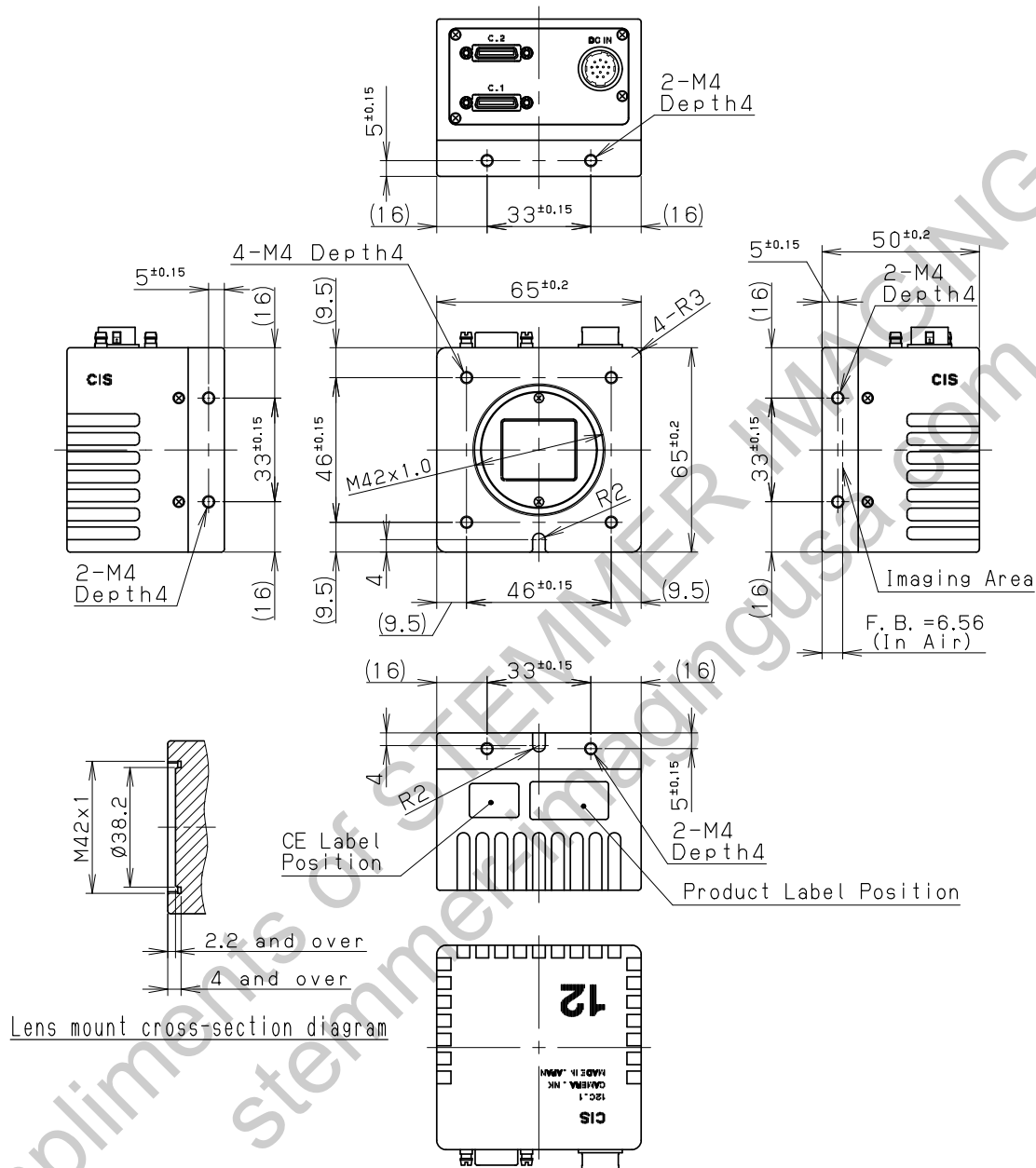


*) Dimensions from the datum plane A to the center of the lens Mount

937-0001-01
(Unit:mm)

15. Dimensions

《VCC-12CL1M-Tx (TOP)》

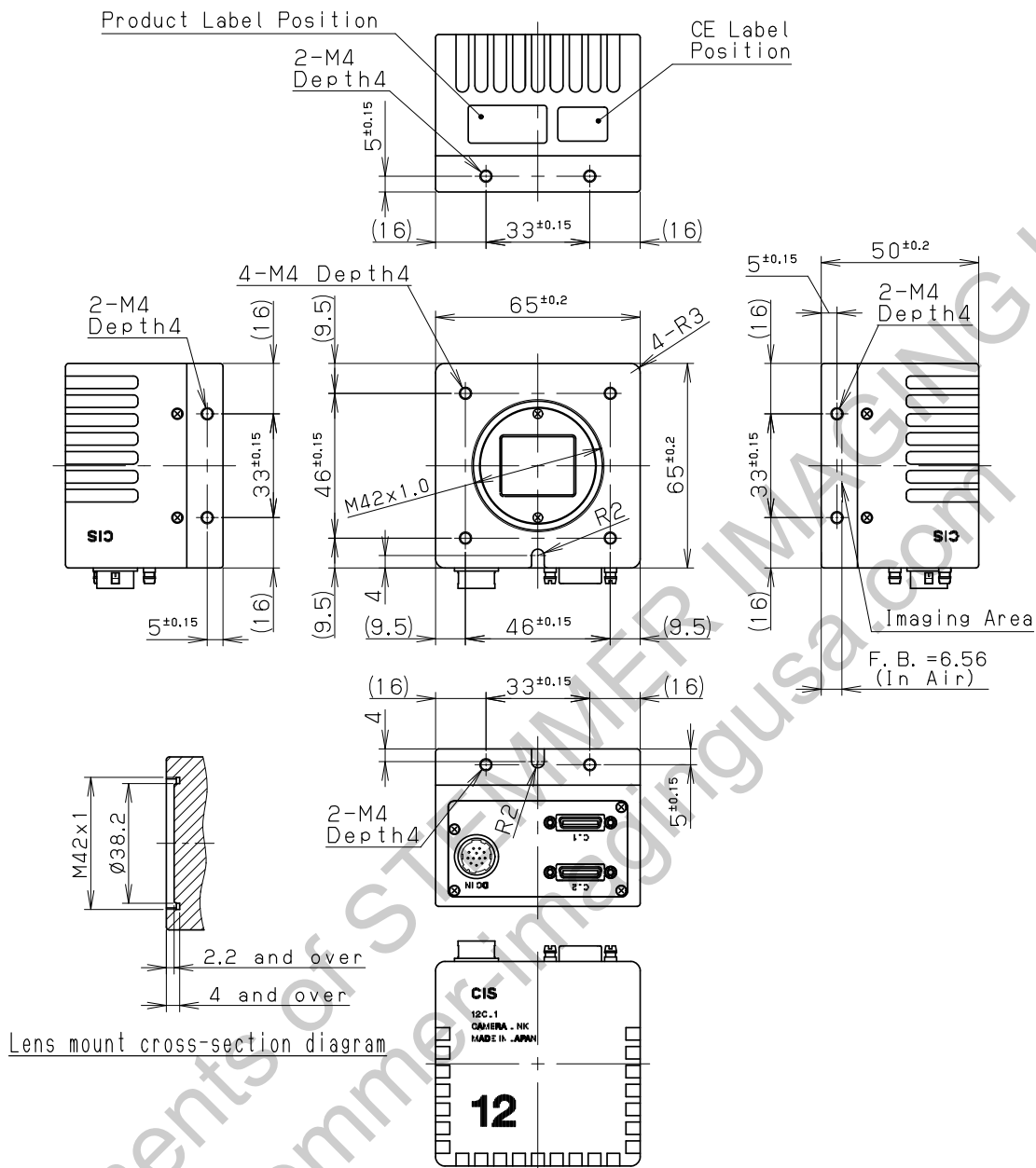


Note 2) Lens mount screw complies with M4x1.0-6H. Please refer to ISO 68-1, 965-1.

Note 1) Please make sure the protrusion portion does not interfere with the lens selected.
Refer to the Lens mount cross-section diagram for the details.

935-0005-01
(Unit:mm)

《VCC-12CL1M-Bx (BOTTOM)》



Note 2) Lens mount screw complies with M42x1.0-6H. Please refer to ISO 68-1, 965-1.

Note 1) Please make sure the protrusion portion does not interfere with the lens selected.

Refer to the Lens mount cross-section diagram for the details.

935-0005-01

(Unit:mm)

[illegible]

Refer to the Lens mount cross-section diagram for the details.

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Technical drawing of the lens mount assembly, showing multiple views and dimensions:

- Top View:** Shows the overall dimensions of the lens mount. Key dimensions include:
 - Overall width: 65 ± 0.2
 - Overall height: 65 ± 0.2
 - Mounting hole pattern: 4-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: M42x1.0, R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- Bottom View:** Shows the underside of the lens mount. Key dimensions include:
 - Mounting hole pattern: 2-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- Side View:** Shows the profile of the lens mount. Key dimensions include:
 - Overall height: 50 ± 0.2 .
 - Mounting hole pattern: 2-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- Cross-section Diagram:** Shows the lens mount cross-section. Key dimensions include:
 - Mounting hole pattern: 2-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- Product Label Position:** Shows the location of the product label on the lens mount. Key dimensions include:
 - Overall width: 65 ± 0.2 .
 - Overall height: 65 ± 0.2 .
 - Mounting hole pattern: 4-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: M42x1.0, R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- CE Label Position:** Shows the location of the CE label on the lens mount. Key dimensions include:
 - Overall width: 65 ± 0.2 .
 - Overall height: 65 ± 0.2 .
 - Mounting hole pattern: 4-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: M42x1.0, R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- Imaging Area:** Shows the location of the imaging area on the lens mount. Key dimensions include:
 - Overall width: 65 ± 0.2 .
 - Overall height: 65 ± 0.2 .
 - Mounting hole pattern: 4-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: M42x1.0, R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .
- F. B. = 6.56 (In Air):** Indicates the focal length of the lens mount.
- Other Dimensions:**
 - Mounting hole pattern: 2-M4 Depth 4, spaced at 33 ± 0.15 and 46 ± 0.15 .
 - Central feature: R2.
 - Side view dimensions: 5 ± 0.15 , 33 ± 0.15 , 46 ± 0.15 , 4 , 9.5 , 16 .

Refer to the Lens mount cross-section diagram for the details.

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16. Cases for Indemnity (Limited Warranty)

The term of warranty of this product is within 3 years after shipping out from our factory

We shall be exempted from taking responsibility and held harmless for damage or losses incurred by the user in the following cases.

- In case damage or losses are caused by fire, earthquake, or other acts of God, acts by third party, deliberate or accidental misuse by the user, or use under extreme operating conditions.
- In case indirect, additional, consequential damages (loss of business interests, suspension of business activities) are incurred as result of malfunction or non-function of the equipment, we shall be exempted from responsibility for such damages.
- In case damage or losses are caused by failure to observe the information contained in the instructions in this product specification & operation manual.
- In case damage or losses are caused by use contrary to the instructions in this product specification & operation manual.
- In case damage or losses are caused by malfunction or other problems resulting from use of equipment or software that is not specified.
- In case damage or losses are caused by repair or modification conducted by the customer or any unauthorized third party (such as an unauthorized service representative).
- Expenses we bear on this product shall be limited to the individual price of the product.

17. CMOS Pixel Defect

CIS compensates the noticeable CMOS pixel defects found at the shipping inspection prior to our shipment. On very rare occasions, however, CMOS pixel defects might be noted with time of usage of the products. Cause of the CMOS pixel defects is the characteristic phenomenon of CMOS itself and CIS is exempted from taking any responsibilities for them. Should you have any questions on CMOS pixel defects compensation, please contact us.

18. Product Support

When defects or malfunction of our products occur, and if you would like us to investigate on the cause and repair, please contact your distributors you purchased from to consult and coordinate.

19. Ordering Information

Model Name	Connector Position	Baud Rate(bps)
VCC-12CL1M-T1	TOP	115200
VCC-12CL1M-T9	TOP	9600
VCC-12CL1M-B1	BOTTOM	115200
VCC-12CL1M-B9	BOTTOM	9600
VCC-12CL1M-L1	LEFT	115200
VCC-12CL1M-L9	LEFT	9600
VCC-12CL1M-R1	RIGHT	115200
VCC-12CL1M-R9	RIGHT	9600