
5Mega CMOS Camera

ID5MB-CL (B/W)

ID5MC-CL (COLOR)

Technical Manual

iDule Corporation

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1. Product Outline

ID5MB-CL/ID5MC-CL is a Camera Link interfaced and 5Mega resolution camera module. 5Mega pixels CMOS sensor with diagonal length mm is utilized. Entire pixels can be read out within 1/35.7s at 3Tap Base Configuration output.

Features

- Global Shutter CMOS sensor is utilized.
- Camera Link Base Configuration is supported.
- Fixed trigger shutter mode, pulse width trigger shutter mode are operable.
- Full frame rates are as follows.

| | | |
|-------------------------|---------|------------------|
| 2Tap Base Configuration | 32.8fps | 8bit/10bit/12bit |
| 3Tap Base Configuration | 35.7fps | 8bit |

2. Handling Precautions

The camera must not be used for any nuclear equipment or aerospace equipment 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.

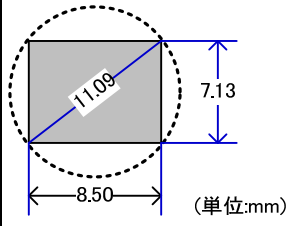
Our warranty does not apply to damages or malfunctions caused by neglecting these precautions.

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°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.
 - 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±10% shall be within ±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. Specification

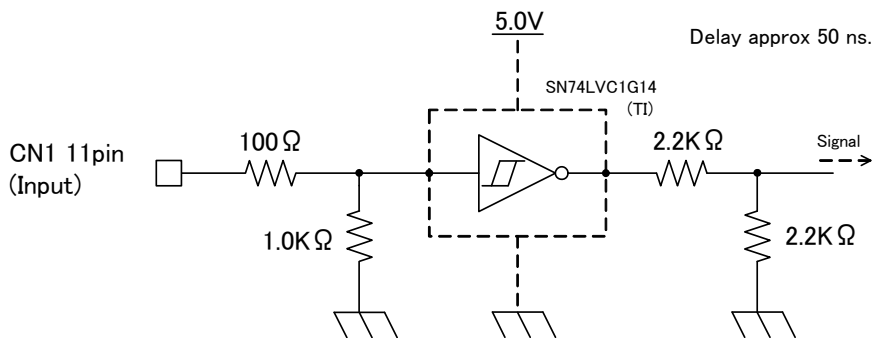
3.1.General Specification

| | | | | |
|---|--|---|-----------------------------------|--|
| (1) Image Sensor | Type | Diagonal length 11.1mm Global Shutter (SONY IMX264) | | |
| | Effective Pixel Number | 2464(H) x 2066(V) | | |
| | Cell Size | 3.45 μ m(H) x 3.45 μ m(V) | | |
| | Image Circle | Φ 11.09mm | | |
|  | | | | |
| (2) Video Output Frequency | Pixel CLK | 85MHz (2Tap) / 66MHz (3Tap) | | |
| | Output effective pixel number | 2464(H) x 2056(V) | | |
| | 2Tap Base Configuration | 32.8fps | 1238(H) x 2089(V) : with Blanking | |
| | 3Tap Base Configuration | 35.6fps | 886(H) x 2089(V) : with Blanking | |
| (3) Video Output | 2Tap Base Configuration 3Tap Base Configuration | | | |
| (4) Output Format | Sensor AD | 12bit | | |
| | Camera Link | 8bit / 10bit / 12bit (3Tap Base Configuration : 8bit fixed) | | |
| (5) Sensitivity | B/W | F11 | 2000lx | |
| | Color | F8 | 2000lx | |
| (at shutter speed 1/32.8s(OFF), Gain 0dB) | | | | |
| (6) Minimum Illumination | B/W | F1.4 | 4lx | |
| | Color | F1.4 | 8lx | |
| (at shutter speed 1/32.8s(OFF), Gain +12dB) | | | | |
| (7) Power Requirements | DC+12V \pm 10% (12pin / PoCL) | | | |
| (8) Power Consumption | typ 2.0 W max 2.5 W | | | |
| (9) Dimensions | H:29.0mm W:29.0mm D:29.0mm excluding projection | | | |
| (10) Weights | Approx. 50g | | | |
| (11) Lens Mount | C Mount | | | |
| (12) Gain | 0dB ~ +12dB | | | |
| (13) Shutter Speed | OFF(1/32.8s) ~ 1/35000s (2Tap) / OFF(1/35.7s) ~ 1/37000s (3Tap) | | | |
| (14) Trigger Mode | Fixed Trigger Shutter Mode, Pulse Width Shutter Trigger Mode | | | |
| (15) Partial Scan | Full Frame ~ 4 Line (4Line/Step) | | Partial Area : 1area | |
| (16) Safety/ Quality Standards | CE To be applied for EN55022:2006 Class B for Emission 06 To be applied for EN61000-6-2:2005 for Immunity | | | |
| | RoHS: Conform to RoHS | | | |
| (17) Durability | Vibration | 20~200 Hz, 98m/s ² (10G), X,Y and Z directions (120 min for each direction) | | |
| | Shock | No malfunction shall be occurred with 980m/s ² (100G) for \pm X, \pm Y, \pm Z, 6 directions. (without package) | | |
| (18) Environment | Operation | -5 $^{\circ}$ C ~ +50 $^{\circ}$ C Humidity 0 ~ 90%RH | | |
| | Storage | -25 $^{\circ}$ C ~ +65 $^{\circ}$ C Humidity 0 ~ 90%RH | | |

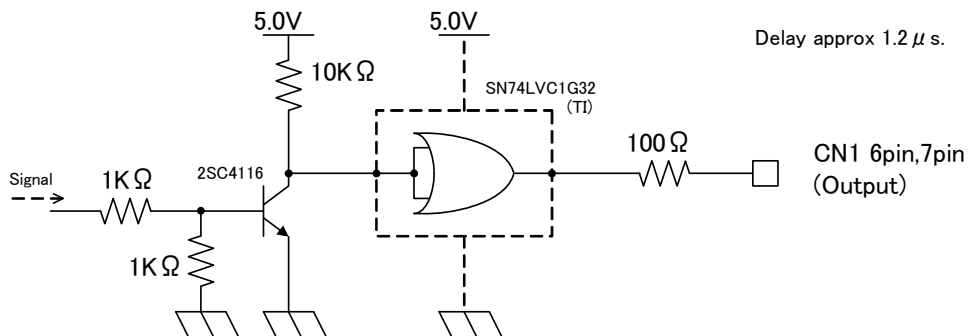
3.2.Camera Output Signal Specification

| | | | |
|--------------------------------|---------------------------|---|---------------------------|
| (1)Video Output Data | Effective Video Output | 2464(H) × 2056(V) | (at Full Frame Scan Mode) |
| (2)Sync Signal Output | LVAL FVAL DVA SP | Camera Link (LVDS) | |
| (3)Camera Control Signal Input | CC2·CC3·CC4 | Camera Link Input(LVDS) | |
| (4)Trigger Input | Polarity | Positive/Negative Selectable | (Address 05) |
| | Pulse Width | 1HD(Min:14.586us) ~Approx 2 frames | |
| | CC1 | Camera Link Input (LVDS) | (Address 06: ↔CN1) |
| (5)Serial Communication | SerTC | Camera Link (LVDS) | (Serial to Camera) |
| | SerTFG | | (Serial to Frame Grabber) |
| (6)Video Signals | White Clip Level | FFEh | (at Gain 0dB, 12bit) |
| | Setup Level | under 060h | |
| | Dark Shading | Both horizontal and vertical should be under 00Fh | |
| (7)Trigger in CN1 | CN1 : 11 pin | Low1.4V(max),High3.3V~5.0V | |
| (8)Exposure out CN1 | CN1 : 6 pin | Low0.55V(max),High3.8V(min) | |
| (9)FVAL out CN1 | CN1 : 7 pin | Low0.55V(max),High3.8V(min) | |

Trigger in CN1

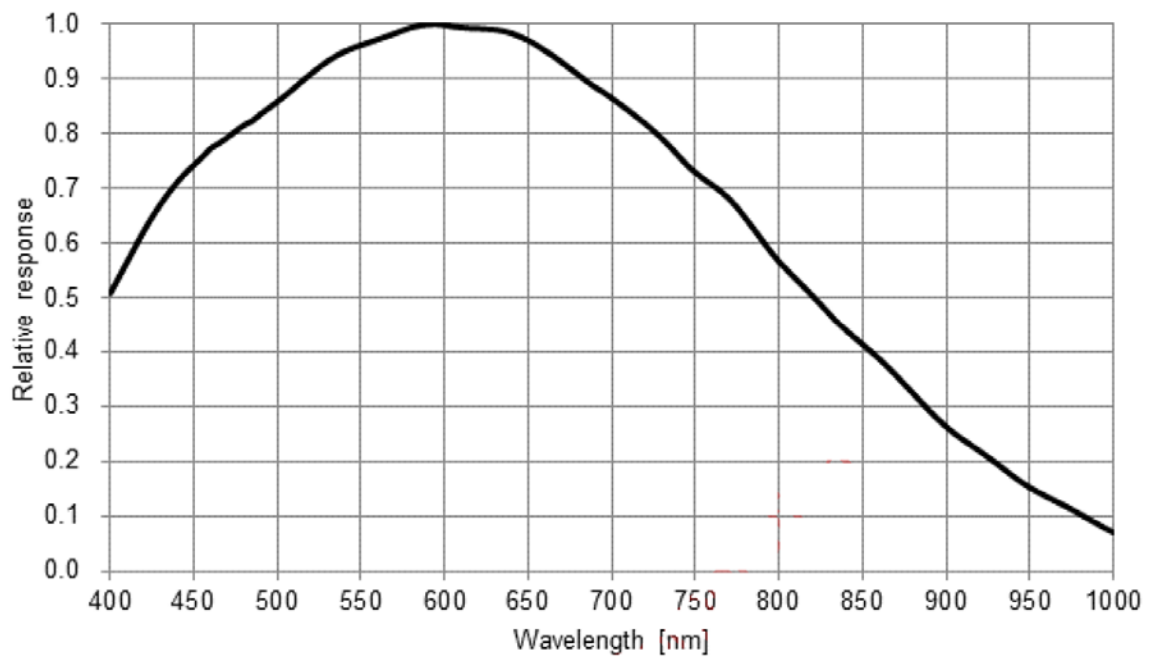


Exposure / FVAL out CN1

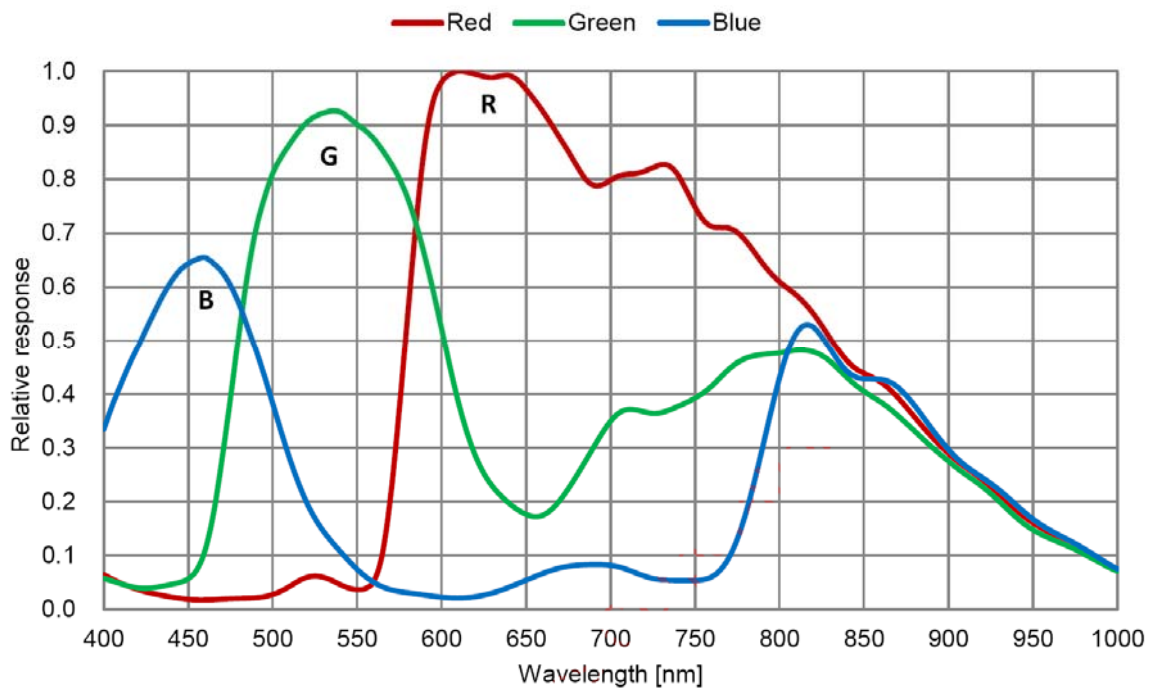


3.3.Spectral Response (Representative Value)

ID5MB-CL (B/W)

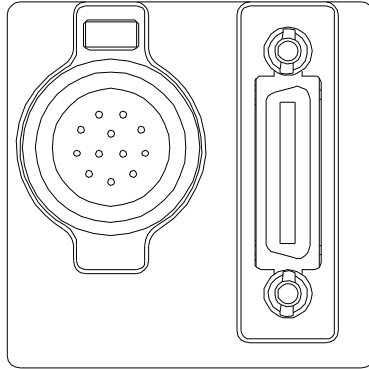


ID5MC-CL (Color)



4. Connector

4.1.Camera Link 12226-1100-00PL(SUMITOMO3M)



Connector (P1)

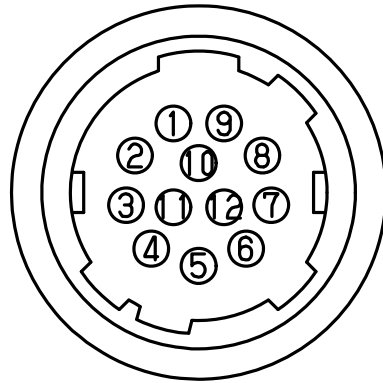
| PIN NO | | PIN NO | |
|--------|---------------------|--------|---------------------|
| 1 | +12V(PoCL) | 14 | GND |
| 2 | X0- | 15 | X0+ |
| 3 | X1- | 16 | X1+ |
| 4 | X2- | 17 | X2+ |
| 5 | Xclk- | 18 | Xclk+ |
| 6 | X3- | 19 | X3+ |
| 7 | SerTC+ | 20 | SerTC- |
| 8 | SerTFG- | 21 | SerTFG+ |
| 9 | CC1- (Trigger IN -) | 22 | CC1+ (Trigger IN +) |
| 10 | CC2+ | 23 | CC2- |
| 11 | CC3- | 24 | CC3+ |
| 12 | CC4+ | 25 | CC4- |
| 13 | GND | 26 | +12V(PoCL) |

4.2.Power LED

Camera turns on LED light, when it is supplied electricity from the frame Grabber board.

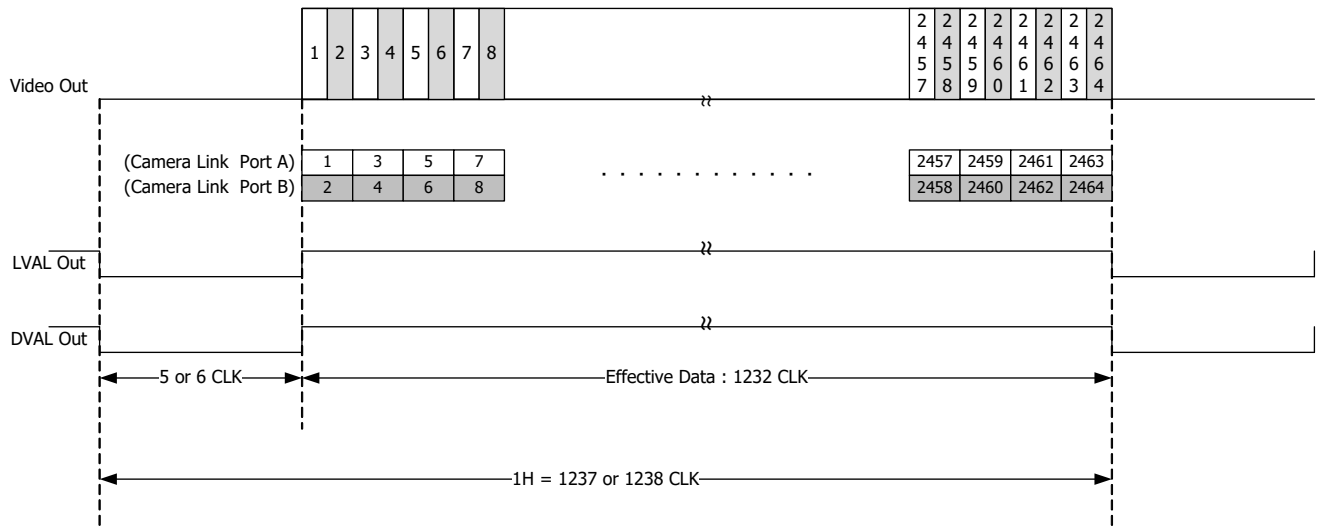
4.3.12pin Connector HR10A-7R-6PB(74) HIROSE

| PIN NO | |
|--------|----------------------|
| 1 | GND |
| 2 | Power Input (DC+12V) |
| 3 | GND |
| 4 | NC |
| 5 | GND |
| 6 | FVAL out |
| 7 | Exposure out |
| 8 | GND |
| 9 | NC |
| 10 | NC |
| 11 | Trigger in |
| 12 | GND |



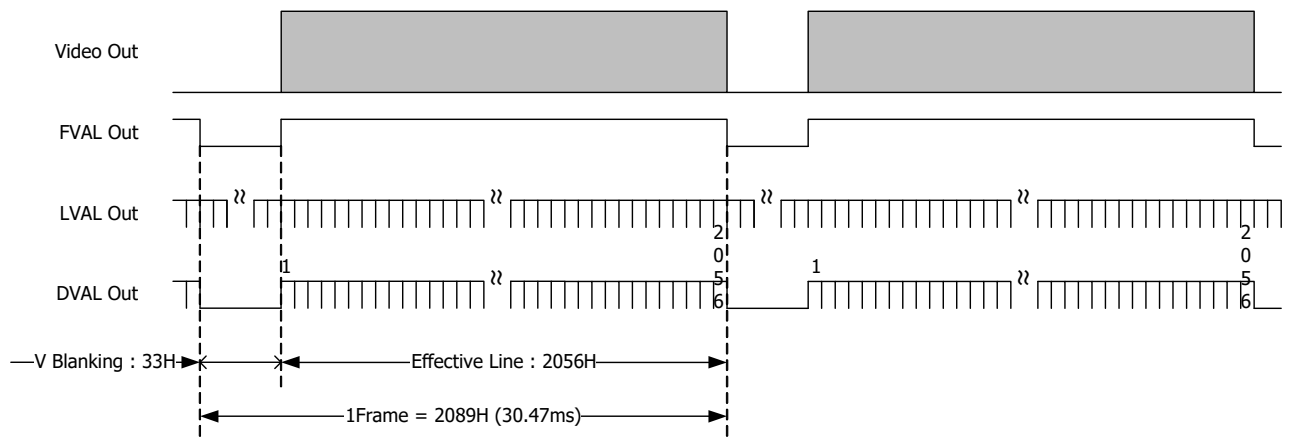
5. Timing Chart

5.1. Horizontal Synchronous Signals Timing (2Tap Base Configuration)



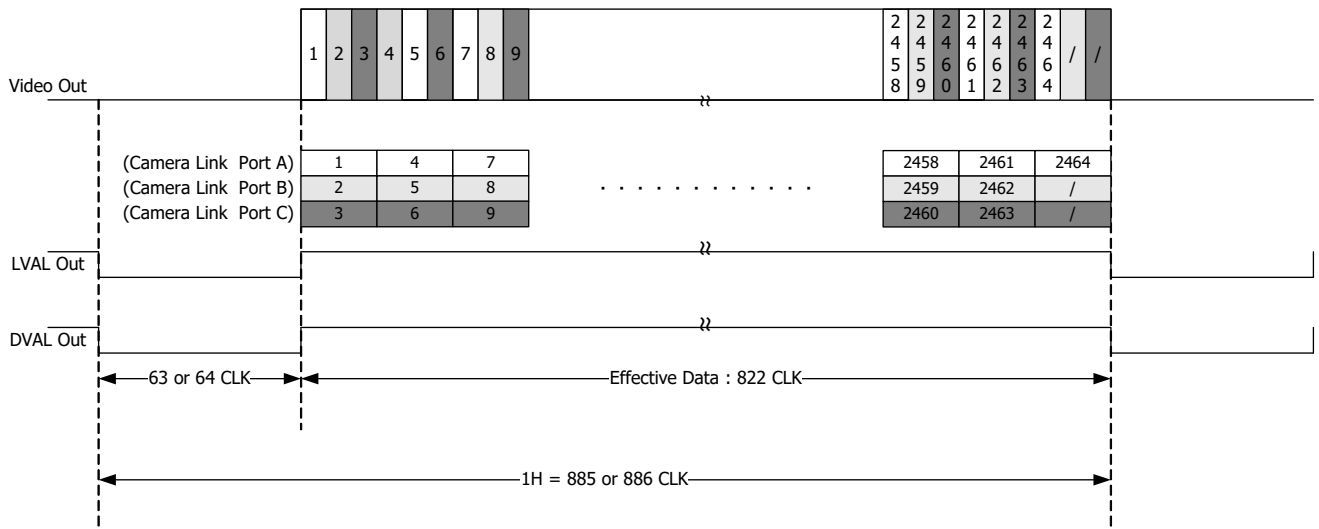
Camera Link CLK : 84.857143MHz
(Clock count per 1frame : 2585585)

5.2. Vertical Synchronous Signals Timing (2Tap Base Configuration)



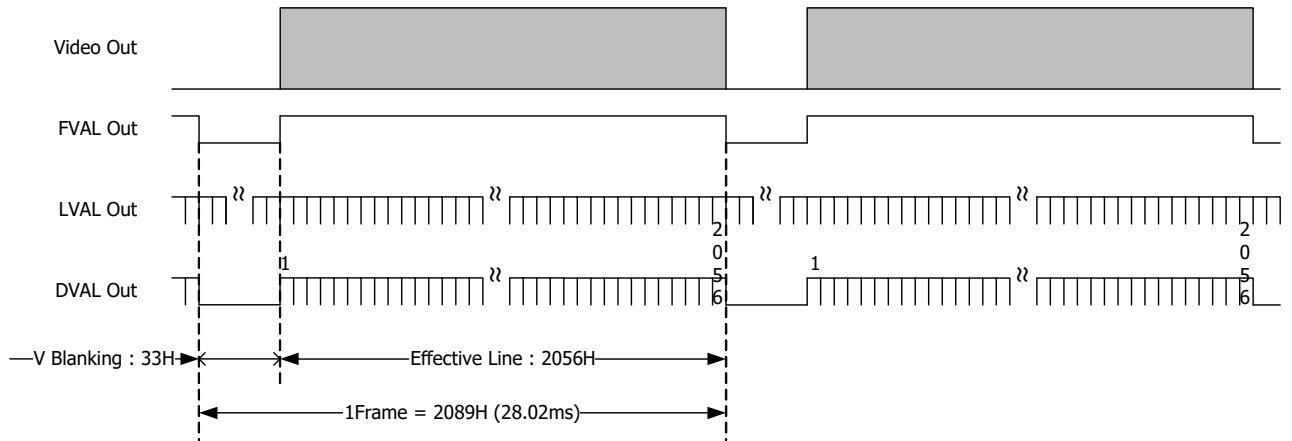
1H = 14.586 us

5.3. Horizontal Synchronous Signals Timing (3Tap Base Configuration)



Camera Link CLK : 66.00MHz
 (Clock count per 1frame : 1849461)

5.4. Vertical Synchronous Signals Timing (3Tap Base Configuration)

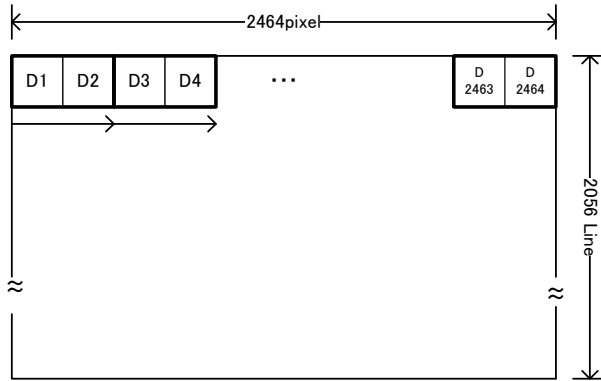


1H = 13.414 us

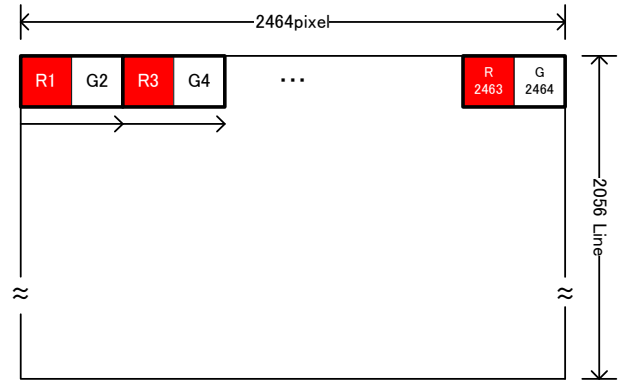
5.5. Output Format

2Tap Base Configuration

ID5MB-CL

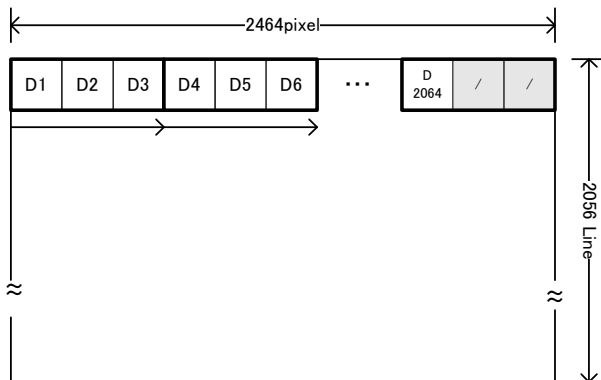


ID5MC-CL

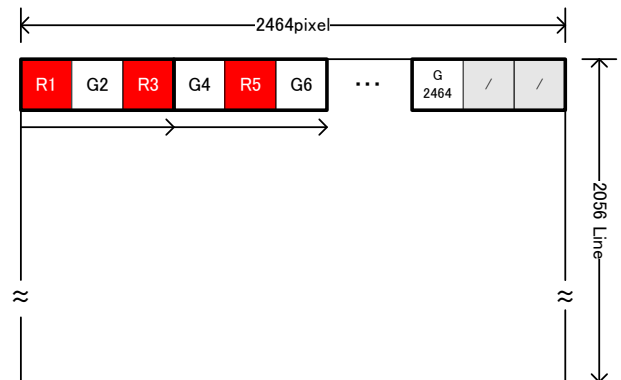


3Tap Base Configuration

ID5MB-CL

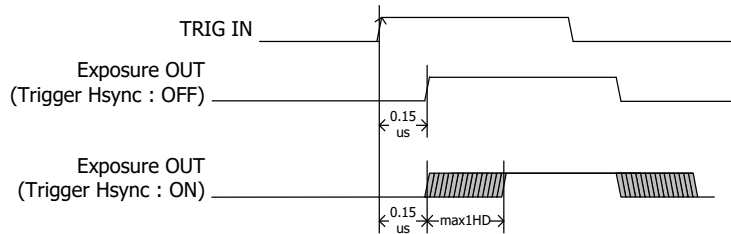


ID5MC-CL



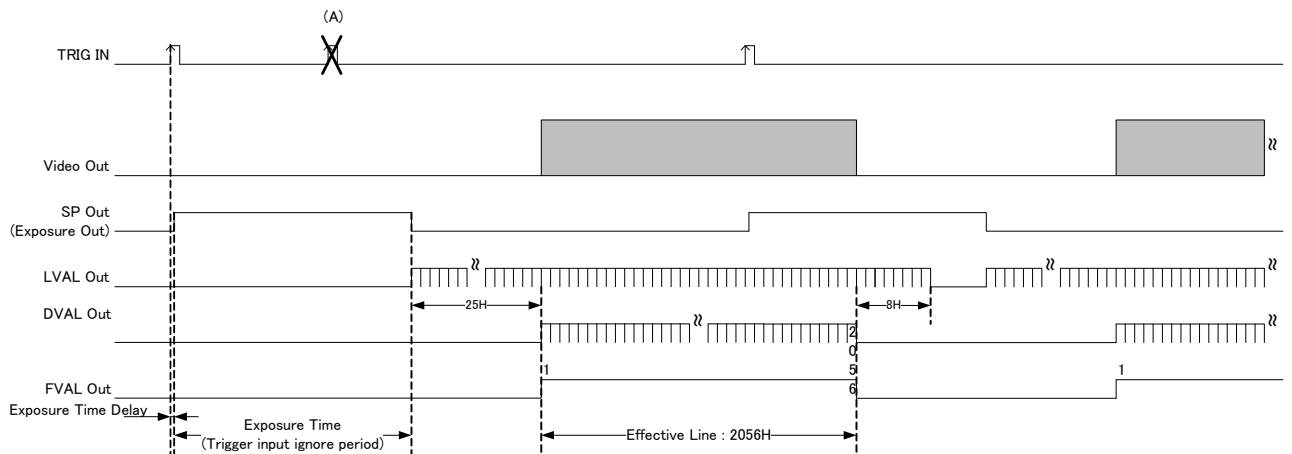
5.6.Fixed Trigger Shutter Mode

- This is the mode to start exposure with external input trigger signals, and set the exposure time with serial commands.
- Delay time (Exposure Time Delay) from detecting trigger edge in the camera to starting exposure is as below.



- (1) Trigger Hsync Mode OFF : 0.15 us fixed
 - (2) Trigeer Hsync Mode ON : 0.15 us + max1HD
 - 2Tap Base Configuration
 - 3Tap Base Configuration
- $$0.15\text{us} + \begin{cases} \text{max 1HD (14.586us)} \\ \text{max 1HD (13.414us)} \end{cases}$$

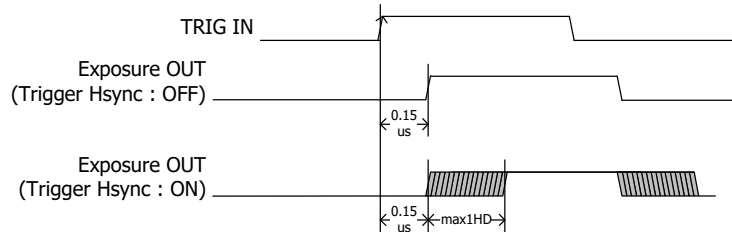
- Triggers can be accepted even when outputting video signals. However, trigger signals for exposure to start the next video output prior to the completion of video transmission for the prior video output signals can not be accepted.
- Trigger input during exposure time should be ignored. (Refer to the below A)



(Caution) Trigger Hsync Mode is available : Change the function ->SAVE->Camera restart

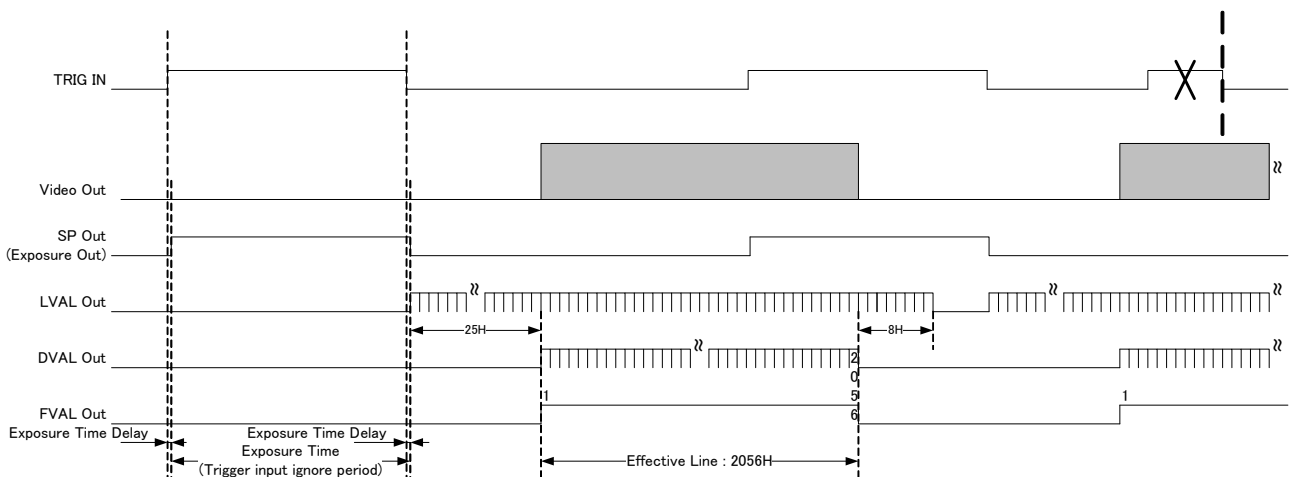
5.7.Pulse Width Trigger Shutter Mode

- This is the mode to start exposure with external input trigger signals, and set the exposure time with pulse width of the trigger signals.
- Delay time (Exposure Time Delay) from detecting trigger edge in the camera to starting exposure, and from detecting trigger end edge to completing exposure is as below.



- (1) Trigger Hsync Mode OFF : 0.15 us fixed
 - (2) Trigeer Hsync Mode ON : 0.15 us + max1HD
 - 2Tap Base Configuration
 - 3Tap Base Configuration
- $$0.15\text{us} + \begin{cases} \text{max 1HD (14.586us)} \\ \text{max 1HD (13.414us)} \end{cases}$$

- Pulse width is min. 1HD (min) to approx. 2 frames.
Functionally, there is no upper limitation, but noises such as dark noises and shadings may be noticeable at long time exposure.
- Triggers can be accepted even when outputting video signals.
However, trigger signals for exposure to start the next video output prior to the completion of video transmission for the prior video output signals can not be accepted.



(Caution) Trigger Hsync Mode is available : Change the function ->SAVE->Camera restart

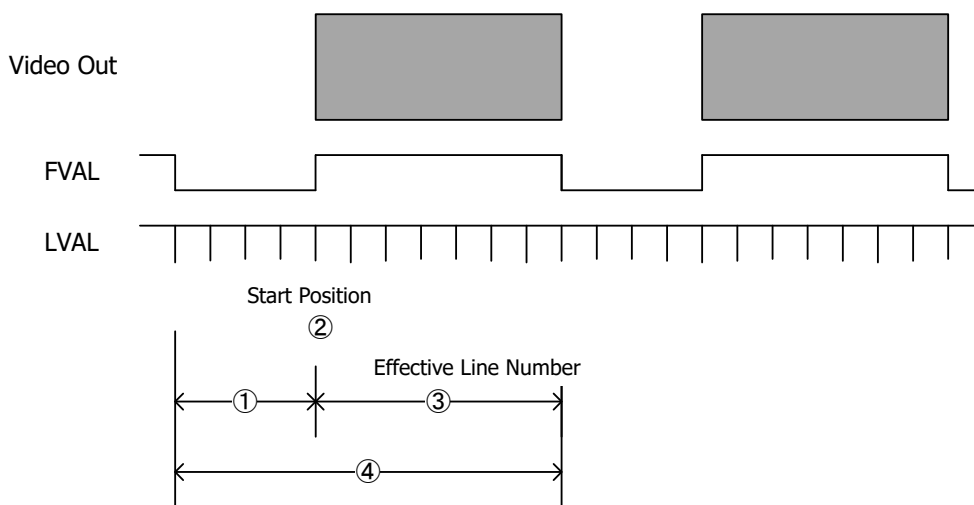
6. Partial Scan Mode

- 1 partial area can be set by serial commands.

Partial Scan Setting

Partial Scan Start Position Address : 40 - 41
 Partial Scan Effective Line Number Address : 50 - 51

Example



- | | |
|--|-------------|
| ① : V Blanking | : 33H fixed |
| ② : Partial Scan Start Position | : 120H |
| ③ : Partial Scan Effective Line Number | : 400H |
| ④ : Total Lines | : 433H(①+③) |

When setting several partial scan areas, please set the start position and effective lines ->**4 x n.**

Total Lines

= **V blanking line number (33H fixed)** + Partial Scan Effective line numbers

Note that "Sum total of partial effective line numbers (except V blanking lines) < **2056** should be met.

Frame Rate = 1 / Total lines

Time for 1 line = 14.586us(2Tap) / 13.414us(3Tap)

Example

| Effective line number | Total line | Frame rate | |
|-----------------------|------------|-------------------------|-------------------------|
| | | 2Tap Base Configuration | 3Tap Base Configuration |
| 4H(min) | 37H | 1852fps | 2014fps |
| . | | | |
| 12H | 45H | 1523fps | 1656fps |
| . | | | |
| 100H | 133H | 515fps | 560fps |
| . | | | |
| 400H | 433H | 158fps | 172fps |
| . | | | |
| 800H | 833H | 82.3fps | 89.4fps |
| . | | | |
| 1600H | 1633H | 41.9fps | 45.6fps |
| . | | | |
| 2056H(max) | 2089H | 32.8fps | 35.6fps |

7. Remote Communication

| Communication Settings | |
|------------------------|-----------------------------|
| Baud Rate | : 9600bps (Initial Setting) |
| Data | : 8bit |
| Stop bit | : 1bit |
| Parity | : None |
| XON / XOFF | : No Control |

- Send Command Format (Host to Camera)

If send a command, set the command and parameter between STX and ETX.

| STX (02H) | Command (2byte) | Parameter(ASCII code) (20H-7FH) | ETX (03H) |
|--------------|--------------------|------------------------------------|--------------|
|--------------|--------------------|------------------------------------|--------------|

- Return Command Format (Camera to Host)

Normally, a camera returns a control code which is ACK or NAK.

If return value has a text message, the message is between STX and ETX.

| | |
|--------------|-------------|
| ACK (06H) | ... Succeed |
|--------------|-------------|

| | |
|--------------|----------|
| NAK (15H) | ... Fail |
|--------------|----------|

| STX (02H) | command (2byte) | parameter(ASCII code) (2FH- 7FH) | ETX (03H) | ... return message |
|--------------|--------------------|-------------------------------------|--------------|--------------------|
|--------------|--------------------|-------------------------------------|--------------|--------------------|

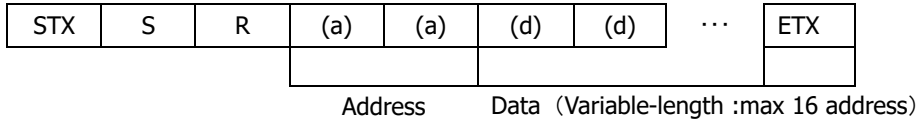
- Command list

| Command | Function |
|---------|-----------------------------------|
| SR | Set some values of resister |
| GR | Get some values of resister |
| SU | Set a user's data |
| GU | Get a user's data |
| CS | Save all configurations |
| CR | Restore all configurations |
| QM | Get a model name |
| QS | Get a serial number |
| QV | Get a firmware version |
| QE | Get a detail of error information |

7.1.Command Specifications

1) Set some values of resister

【Command】 Set : Resister

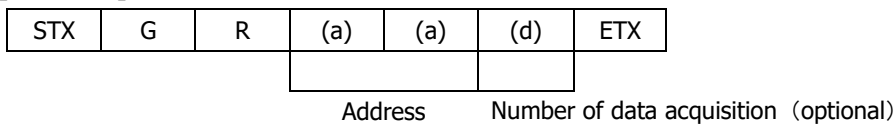


【Return Value】

| | | |
|---------|-----|-----|
| Succeed | ... | ACK |
| Fail | ... | NAK |

2) Get some value of resister

【Command】 Get : Resister



【Return value】

| | | | | | | | | |
|---------|-----|--|---|---|-----|-----|-----|-----|
| Succeed | ... | STX | A | R | (d) | (d) | ... | ETX |
| | | | | | | | | |
| | | Data (Data length depends on the number of acquisitions) | | | | | | |
| Fail | ... | NAK | | | | | | |

【Remarks】

The command gets some value of register of the specified address. The number of the acquisition is between '0' and 'F' (Hexadecimal).

If appoint '0' at the address, the command send data of 16 address. If the command is omitted at the address, the command send an address.

3) Set User's data

【Command】 Set : User's data

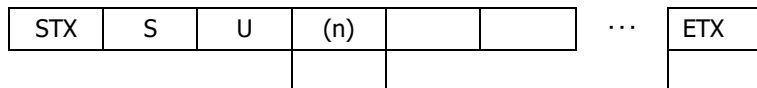
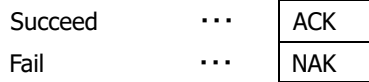


Table No. User's data (fixed length :16byte)
(0~3)

【Return Value】



【Remarks】

The commands, sets free data on the specified register, and can use 4 tables (1 table : 16 characters).

4) Get User's data

【Command】 Get : User's data

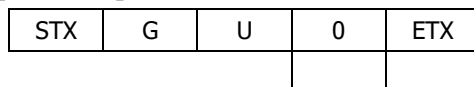
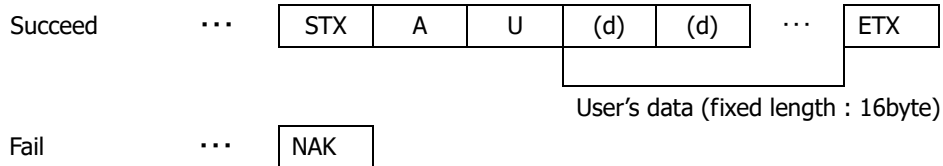


Table No.
(0~3)

【Response】



5) Save all configurations

【Command】 Configuration : Save

| | | | |
|-----|---|---|-----|
| STX | C | S | ETX |
|-----|---|---|-----|

【Return Value】

| | | |
|---------|-----|-----|
| Succeed | ... | ACK |
| Fail | ... | NAK |

6) Restore all configurations

【Command】 Configuration : Restore

| | | | |
|-----|---|---|-----|
| STX | C | R | ETX |
|-----|---|---|-----|

【Return Value】

| | | |
|---------|-----|-----|
| Succeed | ... | ACK |
| Fail | ... | NAK |

7) Get a model name

【Command】 Query : Model name

| | | | |
|-----|---|---|-----|
| STX | Q | M | ETX |
|-----|---|---|-----|

【Return Value】

| | | | | | | | | |
|---------|-----|-----|---|---|-----------------------------------|-----|-----|-----|
| Succeed | ... | STX | R | M | (d) | (d) | ... | ETX |
| | | | | | Model name (Fixed length: 16byte) | | | |
| Fail | ... | NAK | | | | | | |

8) Get a serial number

【Command】 Query : Serial number

| | | | |
|-----|---|---|-----|
| STX | Q | S | ETX |
|-----|---|---|-----|

【Return Value】

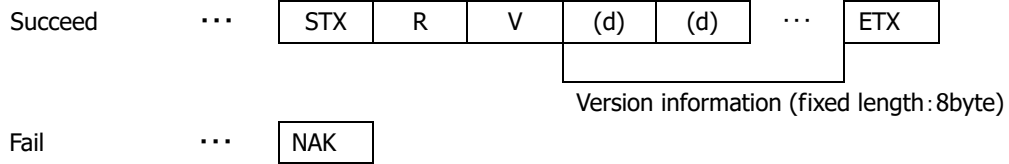
| | | | | | | | | |
|---------|-----|-----|---|---|------------------------------------|-----|-----|-----|
| Succeed | ... | STX | R | S | (d) | (d) | ... | ETX |
| | | | | | Serial Number(Fixed length: 8byte) | | | |
| Fail | ... | NAK | | | | | | |

9) Get a firmware version

【Command】 Query : Version

| | | | |
|-----|---|---|-----|
| STX | Q | V | ETX |
|-----|---|---|-----|

【Return Value】

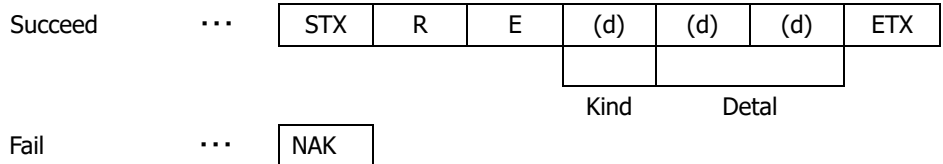


10) Get a detail of error information

【Command】 Query : Error

| | | | |
|-----|---|---|-----|
| STX | Q | E | ETX |
|-----|---|---|-----|

【Return Value】

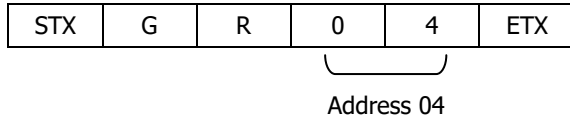


| Kind | | Detail | |
|------|------------------------------|--------|--|
| 0: | No Error | 00: | Normal result |
| 1: | Communication Protocol Error | 00: | The command is undefined. |
| | | 01: | The command length is more than defined. |
| | | 02: | The address is undefined. |
| | | 03: | The value of data is undefined. |
| | | 04: | The length is more than defined. |
| | | 05: | The table number is undefined. |
| | | 06: | The string of user data was abnormal. |
| 2: | Internal Control Error | 00: | Internal control is abnormal. |
| | | 01: | A read only address was written by the command. |
| | | 02: | A protected address was written by the command. |
| | | 03: | Out of range address was written by the command. |
| | | 04: | The selected table number is abnormal. |
| | | 05: | The value of the man acquisition area is abnormal. |
| | | 06: | A function is not implemented. |

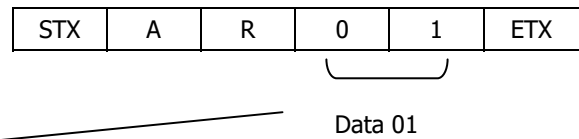
7.2.Control Example

1) How to check trigger shutter mode. (The command gets a value from address 04)

【Send Command】



【Return value form camera】

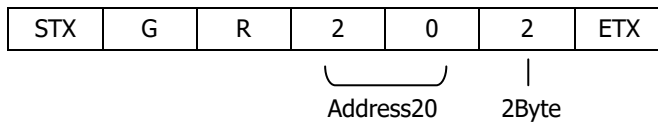


【Receive Return Value】

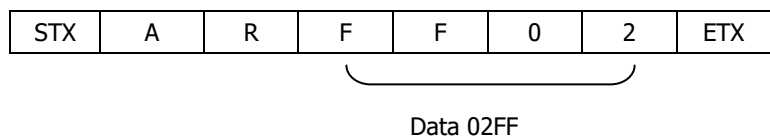
The camera is working with a trigger shutter mode, because the command received a 01 from the camera.

2) How to check trigger shutter mode. (The command gets consecutive 2 bytes values from address 20)

【Send Command】



【Receive return value】

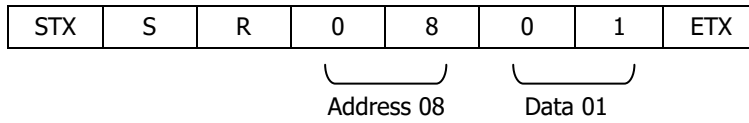


【Receive return value】

The shutter mode of camera is working +12dB, because the command received a 02FF(767) from the camera.

3) How to set partial scan mode. (The command sets 01 for address 08)

【Send Command】



【Return value form camera】

ACK

【Receive Return Value】

The command finished normally, because the command received ACK from the camera.

4) How to set 01FF for manual shutter. (The command set 01FF for address 24)

【Send Command】



【Return value form camera】

ACK

【Receive Return Value】

The command finished normally, because the command received ACK from the camera.

5) How to save configurations of a camera. (The command send CS)

【Send Command】



【Return value form camera】

| |
|-----|
| ACK |
|-----|

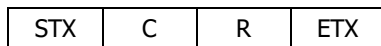


【Receive Return Value】

The command finished normally, because the command received ACK from the camera.

6) How to restore the camera to initial settings. (The command send CR)

【Send Command】



【Return value form camera】

| |
|-----|
| ACK |
|-----|



【Receive Return Value】

The command finished normally, because the command received ACK from the camera.

7) How to get detail of a communication error.

【Send Command】

| | | | | | |
|-----|---|---|---|---|-----|
| STX | G | R | @ | 0 | ETX |
|-----|---|---|---|---|-----|

Set the address invalid value

【Return value form camera】

NAK

【Receive return value】

The command finished abnormally, because the command received 'NAK' from the camera.
When the command did not finish normally, retry to send command or send to get detail of a detail error command.

【Send Command】

| | | | |
|-----|---|---|-----|
| STX | Q | E | ETX |
|-----|---|---|-----|

【Return value form camera】

| | | | | | | |
|-----|---|---|---|---|---|-----|
| STX | R | E | 1 | 0 | 2 | ETX |
|-----|---|---|---|---|---|-----|

Kind1 Detail 02

【Receive Return Value】

The 'GR' command accessed invalid address , because the error command received kind '1' and detail '02'.

8. Function Setting

| Function | address(Hex) | Data(Hex) | | |
|--------------------------------|-----------------------|-----------|--|-------------------------|
| Shutter | 01 | | 2Tap Base Configuration | 3Tap Base Configuration |
| | | 00: | 1/32.8s(OFF) | 1/35.6s(OFF) |
| | | 01: | 1/75s | 1/75s |
| | | 02: | 1/150s | 1/150s |
| | | 03: | 1/350s | 1/350s |
| | | 04: | 1/500s | 1/500s |
| | | 05: | 1/1000s | 1/1000s |
| | | 06: | 1/2500s | 1/2500s |
| | | 07: | 1/5000s | 1/5000s |
| | | 08: | 1/7500s | 1/7500s |
| | | 09: | 1/10000s | 1/10000s |
| | | 0A: | 1/14000s | 1/15000s |
| | | 0B: | 1/17000s | 1/19000s |
| | | 0C: | 1/23000s | 1/25000s |
| | | 0D: | 1/35000s | 1/37000s |
| 0E: | 1/35000s | 1/37000s | | |
| 0F: | Manual (Address24-25) | | | |
| White Balance (Color model) | 02 | 00: | THRU | |
| | | 01: | 3200K | |
| | | 02: | THRU(Spare) | |
| | | 03: | Manual | |
| Trigger Mode | 04 | 00: | Normal(Trigger OFF) | |
| | | 01: | Fixed Trigger Shutter Mode(Address01 -> Shutter Speed) | |
| | | 02: | Pulse Width Trigger Shutter Mode | |
| Trigger Polarity | 05 | 00: | Positive | |
| | | 01: | Negative | |
| Trigger Input | 06 | 00: | CC1 | |
| | | 01: | 11pin (Hirose 12pin connector) | |
| Slow Shutter | 07 | 0 - FF: | min:0(0H) - max:255(FFH) 0: OFF, 255: +255 frame time 1frame = 2Tap Base Configuration : 30.47ms 3Tap Base Configuration : 28.02ms | |
| Partial Scan | 08 | 00: | Full Frame | |
| | | 01: | Partial Scan | |
| Camera output Mode | 0A | 00: | 2Tap Base Configuration | |
| | | 01: | 3Tap Base Configuration | |
| Output bit rate | 0B | 00: | 8bit | |
| | | 01: | 10bit | |
| | | 02: | 12bit | |
| Baud rate | 10 | 00: | 9600bps | |
| | | 01: | 19200bps | |
| | | 02: | 38400bps | |
| | | 03: | 57600bps | |
| | | 04: | 115200bps | |

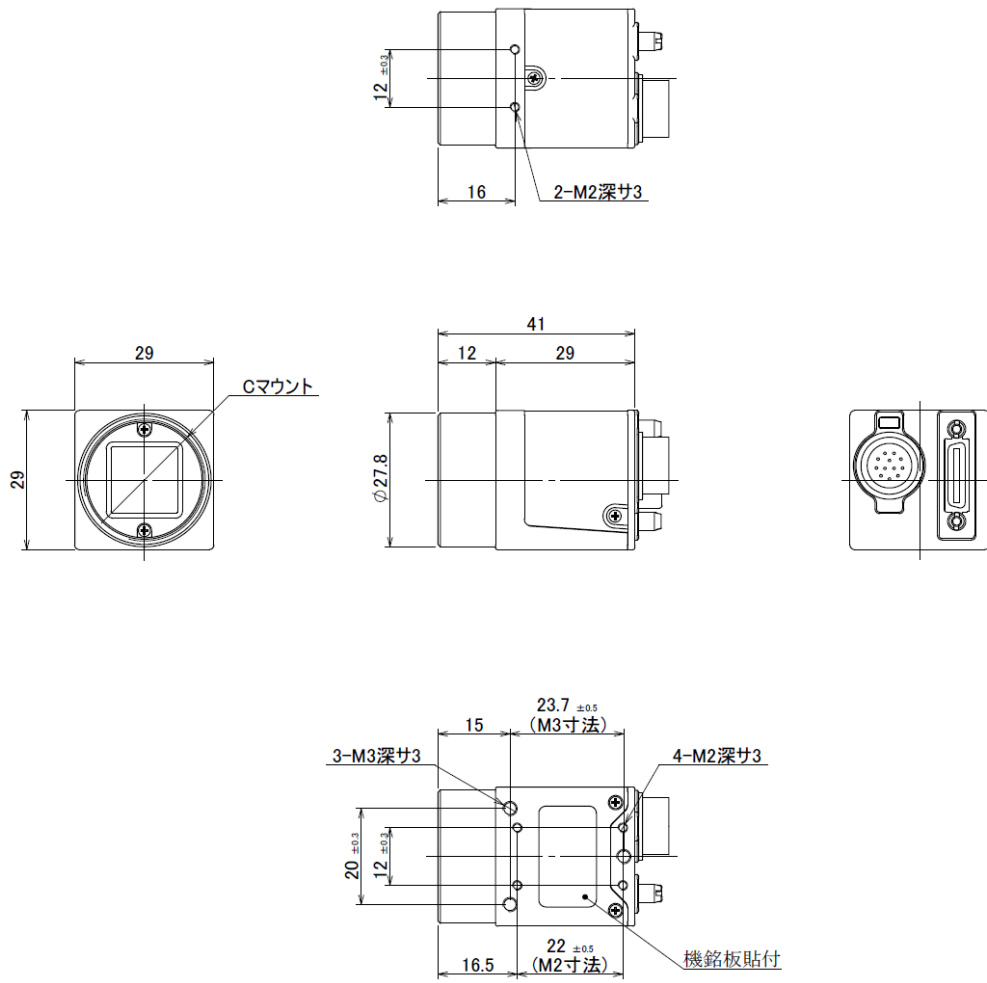
| Function | Address(Hex) | Data(Hex) | |
|---|--------------|-----------|--|
| Flip / Reverse | 18 | 00: | Normal |
| | | 01: | Flip |
| | | 02: | L-R Reverse |
| | | 03: | Flip & L-R Reverse |
| LED ON/OFF | 1B | 00: | OFF |
| | | 01: | ON |
| Manual Gain | 20-21 | 0 - 78: | min:0(0H) - max:120(78H) 0: x1(0dB), 120: x4(+12dB) |
| Manual Shutter | 24-25 | LLHH: | min:0(0H) - max:2079(81FH) 2Tap Base Configuration Shutter time = 13.73us + (2080 - (setting value))×14.586us min:0=30.35ms(1/32.8s) , max:2079=28.32us(1/35000s) 3Tap Base Configuration Shutter time = 13.73us + (2080 - (setting value))×13.414us min:0=27.92ms(1/35.6s) , max:2079=27.14us(1/37000s) |
| | | | |
| Manual White Balance R (Color model) | 28-29 | LLHH: | min:0(0H) - max:767(2FFH) 0: x1(0dB), 767: x4(+12dB) |
| Manual White Balance G (Color model) | 2A-2B | LLHH: | min:0(0H) - max:767(2FFH) 0: x1(0dB), 767: x4(+12dB) |
| Manual White Balance B (Color model) | 2C-2D | LLHH: | min:0(0H) - max:767(2FFH) 0: x1(0dB), 767: x4(+12dB) |
| Partial Scan Start Position | 40-41 | LLHH: | min:0(0H) - max:2052(804H) ※Setting value : 4 x n |
| Partial Scan Effective line number | 50-51 | LLHH: | min:4(4H) - max:2056(808H) |

※ LLHH : The data set with 2 Byte shall be set with Low Byte first, then set with High Byte.

< Example > Manual Gain(Address 24-25) ->767(02FFH)

STX SR 24 FF 02 ETX

8. Dimensions



(単位:mm)

9. Initial Setting

| Function | Address | Data | |
|--------------------------------------|---------|-------|-------------------------|
| Shutter | 01 | 00: | 1/32.8s(OFF) |
| White Balance (Color model) | 02 | 01: | 3200K |
| Trigger Mode | 04 | 00: | Normal (Trigger OFF) |
| Trigger Polarity | 05 | 00: | Positive |
| Trigger Input | 06 | 00: | CC1 |
| Slow Shutter | 07 | 00: | OFF |
| Partial Scan Mode | 08 | 00: | Full Frame |
| Camera Output Mode | 0A | 00: | 2Tap Base Configuration |
| Output Data Selection | 0B | 00: | 8bit |
| Baud Rate | 10 | 00: | 9600bps |
| Output Image Flip | 18 | 00: | Normal |
| LED ON/OFF | 1B | 01: | ON |
| Manual Gain | 20-21 | 0000: | 0dB |
| Manual Shutter | 24-23 | 0000: | Shutter(OFF) |
| Manual White Balance R (Color model) | 28-29 | 0000: | 0dB |
| Manual White Balance G (Color model) | 2A-2B | 0000: | 0dB |
| Manual White Balance B (Color model) | 2C-2D | 0000: | 0dB |
| Partial Scan Start Position | 40-41 | 0000: | Start Position 0 |
| Partial Scan Effective Lines | 50-51 | 0808: | Effective lines 2056 |

10. Cases for Indemnity (Limited Warranty)

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).

11. CMOS Pixel Defect

IDULE 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 IDULE is exempted from taking any responsibilities for them. Should you have any questions on CMOS pixel defects compensation, please contact us.

12. 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.