

Progressive Scan CCD Camera

CV-M10 series (Rev.B)

Operation Manual

Applicable only for serial no.

CV-M10BX

EIA : E010201 ~

CCIR : C010501 ~

CV-M10RS

EIA : E010601 ~

CCIR : C010731 ~



DECLARATION OF CONFORMITY

AS DEFINED BY THE COUNCIL DIRECTIVE 89/336/EEC

EMC(ELECTROMAGNETIC COMPATIBILITY)

**WE HEREWITH DECLARE THAT THIS PRODUCT
COMPLIES WITH THE FOLLOWING PROVISIONS APPLYING TO IT.**

EN-50081-1

EN-50082-1

ENGLISH VERSION



The lighting flash with arrowhead symbol, within an equilateral triangle, is intend to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



The slash within a circle is intended to alert the user to the presence of prohibition of any kind of operation, maintenance and storage.



The abstraction within a circle is intended to alert the user to presence of prohibition to disassemble the product's.



The abstraction within a circle is intended to alert the user to power off the product's and to take off the plug.



The abstraction within a circle intended alert the user to presence of prohibition to expose the product's to rain, moisture or any kind of wet place.

CV-M10

Precautions



Do not attempt to disassemble this camera.



To prevent electric shock, do not remove cover. There are no user-serviceable parts inside. Refer servicing to qualified service personnel.



Do not expose this camera to rain or moisture.



Do not face this camera towards the sun, extreme bright light or light reflecting objects. Even when this camera is not in use, put the supplied shade-cap on the camera head.



Handle this camera with the maximum care.



Operate this camera only from the type of power source indicated on the camera.



Power off the camera during any modification such as changes of jumper-line and jumper-register.

USER'S RECORD

The production serial number are shown on the bottom of camera

Model Name :

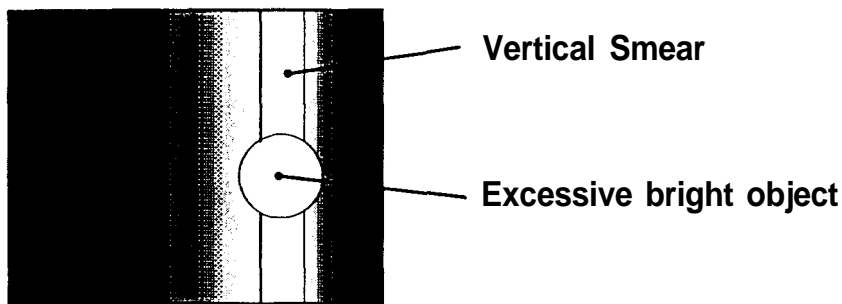
Serial No. :

Typical CCD Characteristics

The following effects may be observed on the video monitor screen do not indicate any fault of the CCD camera, but do associate with typical CCD characteristics.

✕ V. Smear

Due to an excessive bright object such as electric lighting, sun or strong reflection, vertical smear may be visible on the video monitor screen. This phenomenon is related to the characteristics of Interline Transfer System employed in the CCD.



Video monitor screen

✕ V. Aliasing

When the CCD camera shoots stripes, straight lines or similar patterns, jagged image on the monitor may be appeared.

✕ Blemishes

An array of individual sensor elements (pixel) in the CCD image sensor may consist of blemish, although it is not a problem in practical operation.

✕ Patterned Noise

When the CCD camera shoots a dark object at high temperature, fixed pattern noise (dots) may be appeared over the entire area of the video monitor screen.

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1. General

The CV-M10 series (Rev.B) is a newly designed machine vision camera equipped with a progressive scanning CCD image sensor. With top features as progressive scanning and square shaped pixels, the CV-M10 series offers a superb image quality in versatile applications such as machine visions, high speed video capturing, pattern recognition, etc.

Model Designation

- * *CV-M10BXE/RSE* EIA (VGA corresponded) versions are available with the following features.
 - *CV-M10BXE* is the basic progressive scan camera with full functions.
 - *CV-M10RSE* is the extended version with digital setup function via RS232C serial control.
- * *CV-M10BXC/RSC* CCIR versions are available with the following features.
 - *CV-M10BXC* is the basic progressive scan camera with full functions.
 - *CV-M10RSC* is the extended version with digital setup function via RS232C serial control.

2. Main features

- * Progressive Scan CCD sensor of 1/2" format, interline-transfer type
- * Square Pixel
- * High Speed Shutter
 - *CV-M10BXE/RSE*: up to 1/800,000 sec.
 - *CV-M10BXC/RSC* : up to 1/917,000 sec.

(High speed shutter in CCIR version is in function only at Random trigger shutter mode.
Without random trigger, it works up to 1/10000 sec.)

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* Random Trigger Shutter

- *CV-M10BXE/RSE* up to 1/800,000 sec.
- *CV-M10BXC/RSC* up to 1/917,000 sec.

* High Resolution

- *CV-M10BXE/RSE* H. 530 and V. 400 TV lines (effective pixel elements 659H x 494V)
- *CV-M10BXC/RSC* H. 550 and V. 400 TV lines (effective pixel elements 782H x 582V)

* VGA Format

The effective elements of CV-M10BXE/BXC correspond to VGA specifications, besides it produces video signal according to EIA TV Standards.

* Electronics are accommodated in the durable housing of compact size.

* Digital set up via RS232C serial control (*CV-M10RSE/RSC* only)

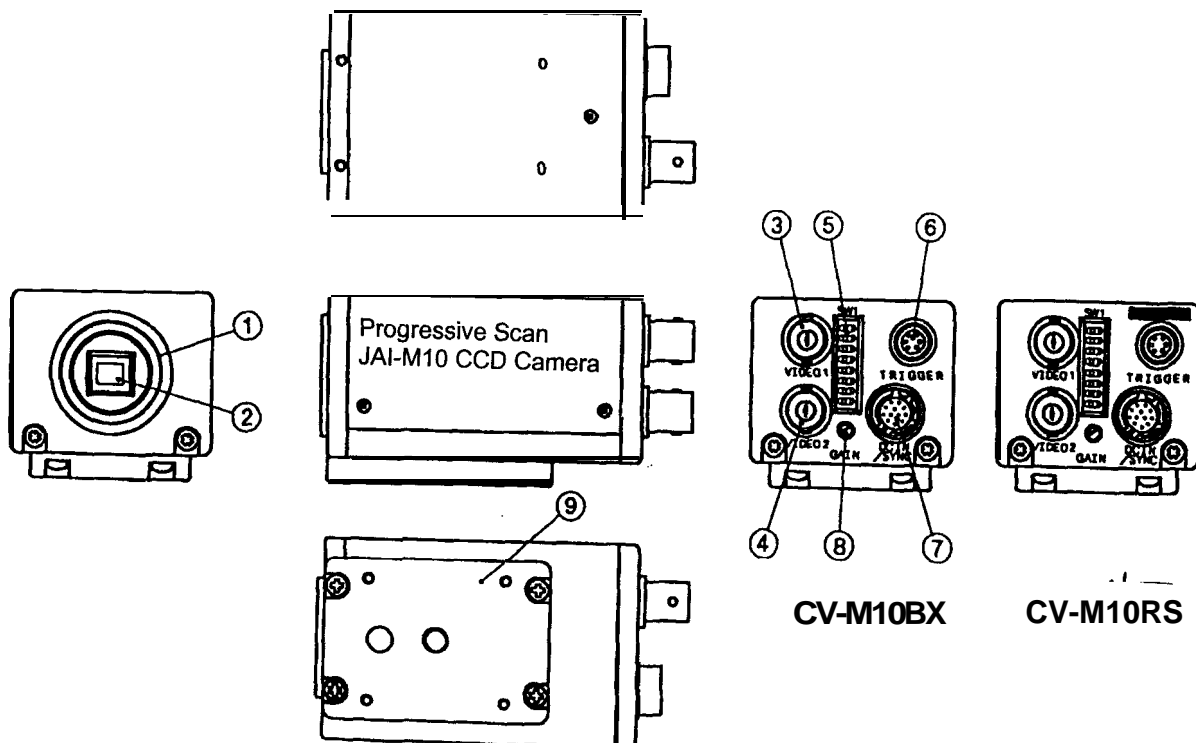
Pixel clock output (User's option)

3. Standard Composition

- | | |
|------------------------|-----|
| 1) Camera main body | x 1 |
| 2) 12P Multi connector | x 1 |
| 3) 6P Multi connector | x 1 |
| 4) Tripod mount plate | x 1 |
| 5) Operation manual | x 1 |

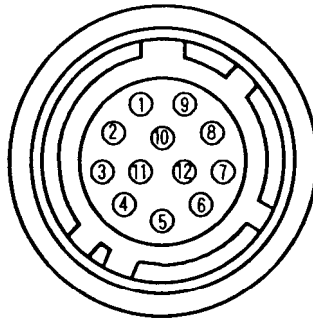
4. Locations

- | | |
|--|---|
| ① Lens Mount | : C-mount type |
| Note : Rear protrusion on the C-mount lens must be less than 7mm (0.28 inch approx.) | |
| ② CCD sensor | : Interline-transfer type CCD with On-chip lens |
| ③ Video output 1 | : VS1 .0Vp-p output |
| ④ Video output 2 | : VS1 .ovp-p output |
| ⑤ SW1 switch | : Switch on the rear panel to set shutter speed and other function modes |
| ⑥ 6 Pin connector | : Input of external trigger (WEN output) and In/Output of communication signals |
| ⑦ 12 Pin connector | : Input of 12VDC power, external sync signals and output of Video signal |
| ⑧ GAIN | : Adjusting Gain level of the video output 1 |
| ⑨ Tripod mount plate | : Fixing the camera head on tripod or others |



5. Pin Assignment

1) 12P Multi connector (DC-IN / SYNC)



HA10A-1 0P-12S Hirose

| Pin no | Ext. HD/VD Input Mode (Factory Pre-set) | Ext.Trigger Mode | | Int. HD/VD output Mode |
|--------|---|----------------------|--------------------|---------------------------|
| | | Random Trigger | Long Time Exposure | |
| 1 | GND | GND | | GND |
| 2 | DC+12V Input | DC+12V Input | | DC+12V Input |
| 3 | GND | NC | | NC |
| 4 | Video-1 output | Video-1 output | | Video-1 output |
| 5 | GND | GND | | GND |
| 6* | Ext HD Input (75 Ω) | Ext HD Input | | Int HD output |
| 7* | Ext VD Input (75 Ω) | * See note.3 | Ext VD Input | Int VD output |
| 8 | GND | GND | | GND |
| 9* | Video-2 output or NC | Video-2 output or NC | | Video-2 output or NC |
| 10 | GND | GND | | GND |
| 11 | DC+12V Input | DC+12V Input | | DC+12V Input |
| 12 | GND | GND | | GND |

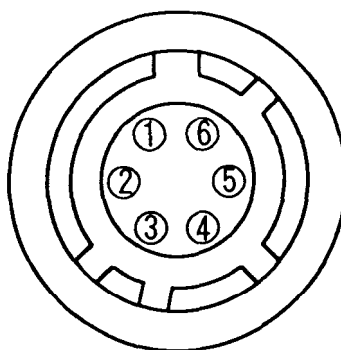
* Note : 1. To change the signal output on pin no. 6,7 and 9, it is necessary to make jumper setting.
See 8. Ext/Int HD/VD Operation and Pixel Clock Output for more information.

| Pin No. | Factory Pre-set | Others |
|---------|-----------------|--------------------|
| 6 | Ext HD input | Int HD output |
| 7 | Ext VD input | Int VD output |
| 9 | Video-2 output | Pixel clock output |

2. Video-2 output on pin no. 9 is effective only at 2:1 interlace mode.
3. Do not input Ext. VD signal at pin no.7 of 12P Multi connector, as it causes a failure in random trigger mode operation.

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2) 6P Multi connector (TRIGGER)



HA10A-1 0p-6S Hirose

| Pin no. | CV-M10BX | CV-M10RS |
|---------|--------------------|--------------------|
| 1 | NC | TXD |
| 2 | NC | RXD |
| 3 | GND | GND |
| 4 | NC | NC |
| 5 | Ext. Trigger Input | Ext. Trigger input |
| 6 | WEN pulse output | WEN pulse output |

Note :
CV-M10 series camera generates and output WEN (Write ENable pulse at pin no.6 of 6P Multi connector when ext. trigger pulse is input at pin no.5 of 6P Multi connector.

WEN pulse indicates a duration time of effective video signal generated by the operation in Random Trigger Mode and Long Time Exposure Mode, and it is useful to set a timing with frame grabber and other image processing equipment.

6. Functions

1) Progressive Scan

Progressive scanning CCD employed in CV-M10 series was developed to produce Full Frame Output in shutter mode, enabling to make the vertical resolution doubled and higher dynamic resolution compared with the conventional field output images, and thus it gives you a great advantage and best solution in the critical image processing field. The standard scanning camera, being set to shutter mode produces picture only in the field output gives you a limited resolution.

2) Output Signal in Random Trigger Mode & Long Time Exposure Mode

A. 2:1 Interlace image in field accumulation

2:1 interlaced image in field accum. with two 252.5 lines (EIA), 312.5 lines (CCIR) in 1/60 sec. (EIA), 1/50 sec. (CCIR) are simultaneously available from Video Output (1) and Video Output (2).

EIA/CCIR Timing Charts (2:1 Interlace) are described on the following pages.

- Video Output (1) is the output in ODD-EVEN-ODD sequence.

- Video Output (2) is the output in EVEN-ODD-EVEN sequence.

These two Interlaced image output in field accumulation shall be mixed together in a video capture board, which has to be bought at a frame grabber supplier.

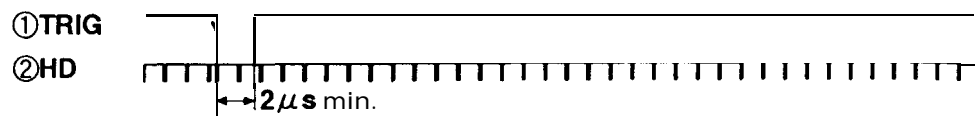
B. Non-interlace

Non-interlaced image with full 525 lines in 1/30 sec. (EIA) and 625 lines in 1/25 sec. (CCIR) are available in shutter mode from Video Output (1) connector. EIA/CCIR Timing Charts (Non-interlace) are described on the following pages.

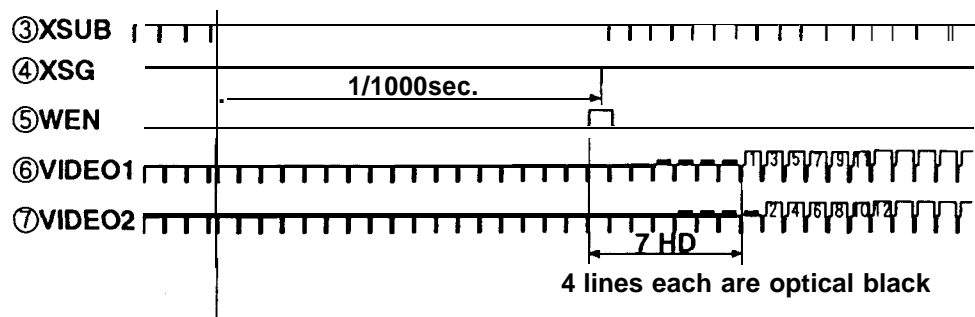
A. 2:1 interlace in field accumulation

A-1. EIA (HD:63.56 μ sec. VD:16.7msec.)

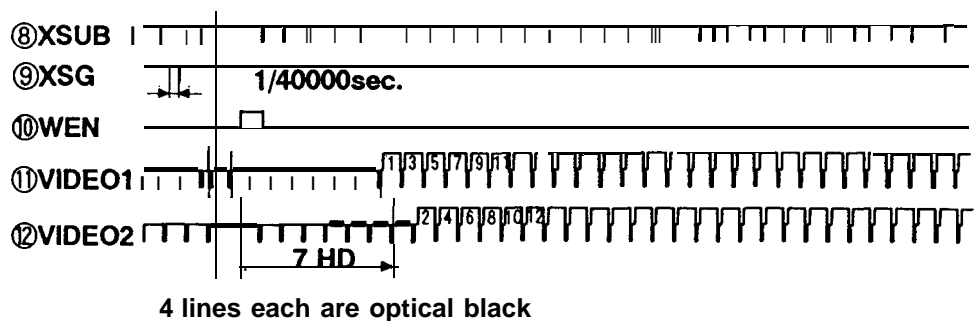
(1) Random trigger mode



Normal shutter (e.g. 1/1000sec.)

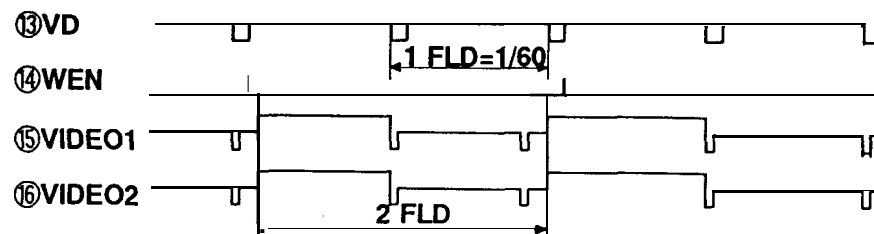


High speed shutter (e.g. 1/40000sec.)



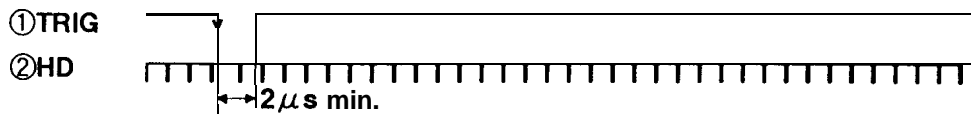
(2) Long-time Exposure mode (e.g. 2FLD)

This mode does not work at Random Trigger mode.

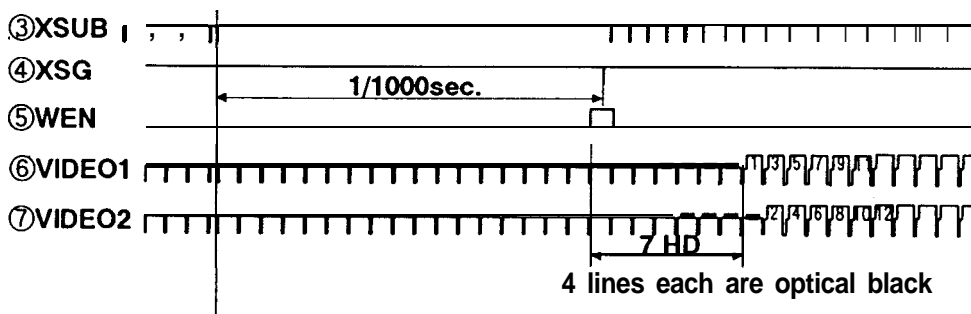


A-2. CCIR (HD:64.0 μ sec. VD:20msec.)

(1) Random trigger mode

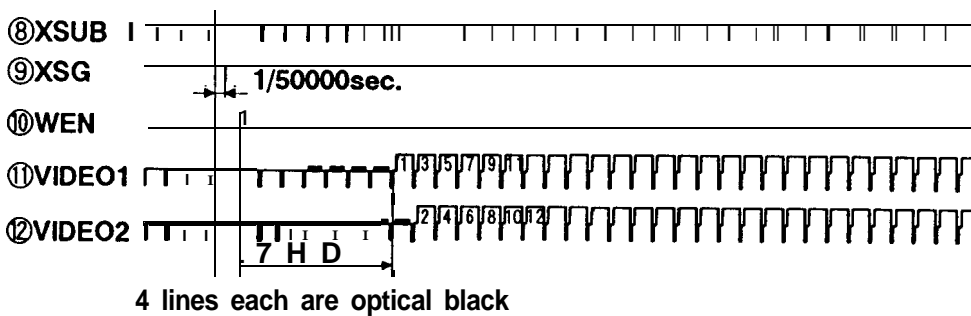


Normal shutter (e.g. 1/1000sec.)



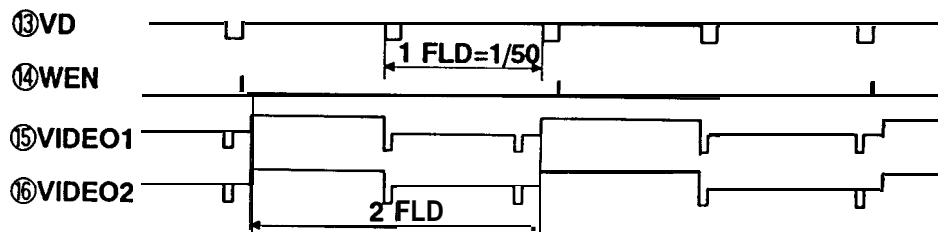
High speed shutter (e.g. 1/50000sec.)

High speed shutter (1/25000~1/917000sec.) works only at Random Trigger mode.



(2) Long-time Exposure mode (e.g. 2-FLD)

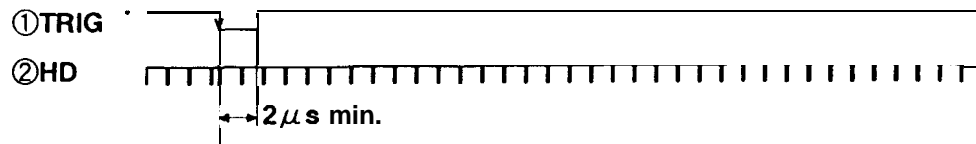
This mode does not work at Random Trigger mode.



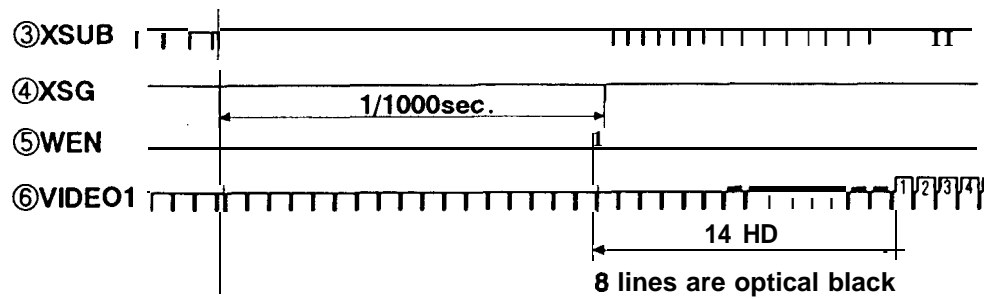
B. Non-interlace

B-I. EIA (HD:63.5 μ sec. VD:33.4msec.)

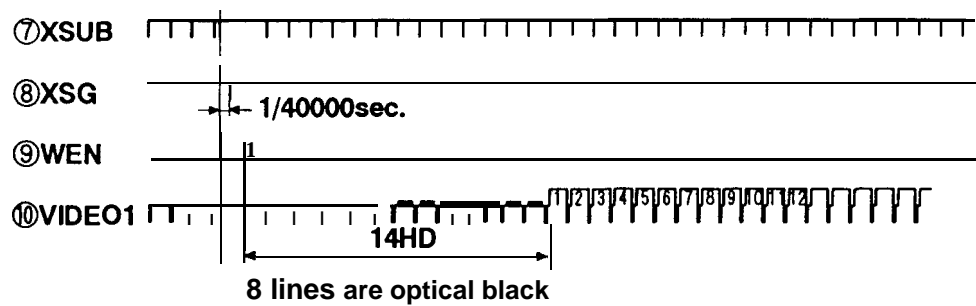
(1) Random trigger mode



Normal shutter (e.g. 1/1000sec.)

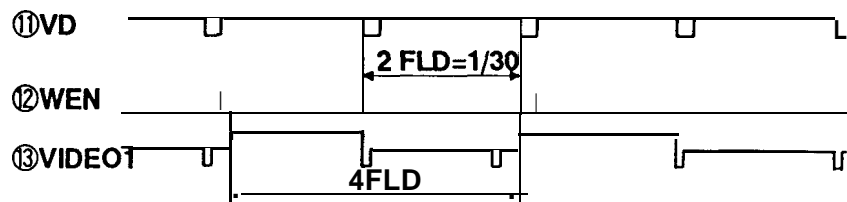


High speed shutter (e.g. 1/40000sec.)



(2) Long-time Exposure mode (e.g. 4-FLD)

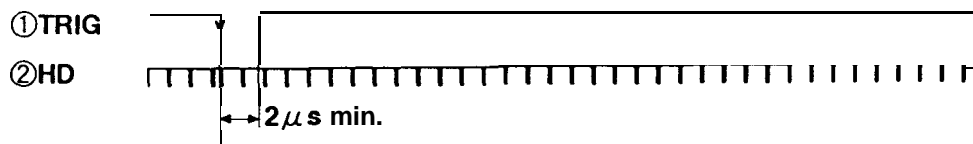
This mode does not work at Random Trigger mode.



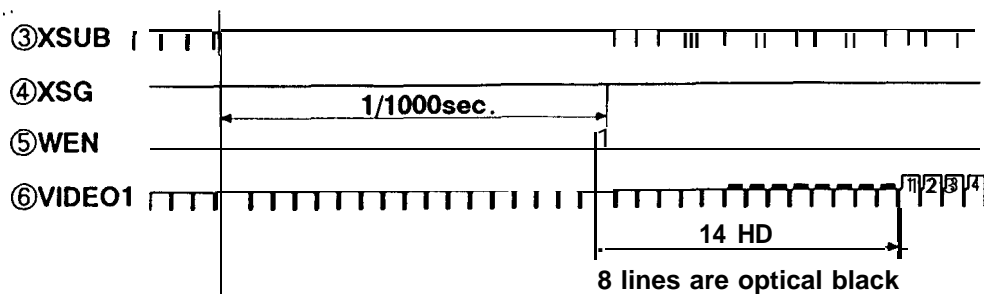
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B-2. CCIR (HD:64.0 μ sec. VD:40msec.)

(1) Random trigger mode

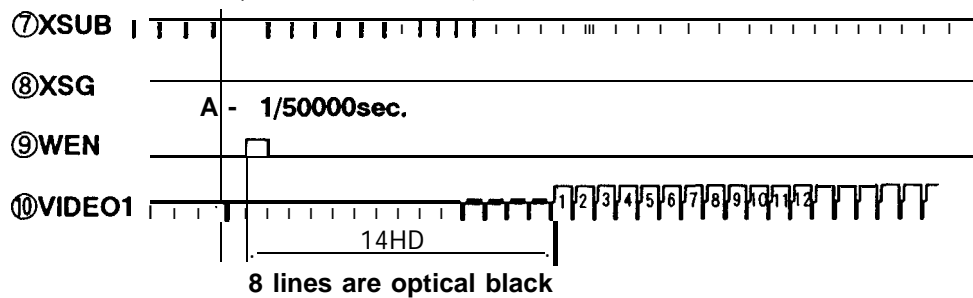


Normal shutter (e.g. 1/1000sec.)



High speed shutter (e.g. 1/50000sec.)

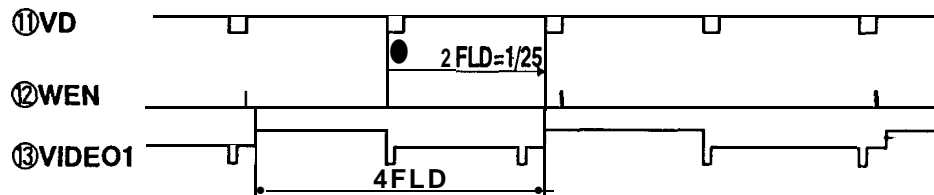
High speed shutter (1/25000~1/917000sec.) works only at Random Trigger mode.



(2) Long-time Exposure mode

(e.g. 4-FLD)

This mode does not work at Random Trigger mode.



3) **VGA Format**

The pixel of *CV-M10 series* (EIA : 659H x 494C, CCIR : 782H x 582V) offers capability to meet the VGA format which is internationally utilized for computer display applications having 640H x 480V numbers of pixels, besides it produces standard video signals according to EIA.

4) **Analog Output**

CV-M10 series produces analog output only. There is no A/D converter at output stage, nor video memory in the camera main body.

5) **Scan Speed**

CV-M10 series camera makes scanning with the frequencies according to the conventional TV Standards.

H. frequency 15.734KHz and V. frequency 60Hz (CV-M10BXE/RSE)

H. frequency 15.625KHz and V. frequency 50Hz (CV-M10BXC/RSC)

6) **Random Trigger Shutter (asynchronous)**

CV-M10 series is equipped with the asynchronous random trigger shutter up to 1/800,000 sec. for *CV-M10BXE/RSE*, and up to 1/917,000 sec. for *CV-M10BXC/RSC*.

7) **RS-232C Serial Control (available on CV-M10RSE/RSC only)**

Camera set-up functions such as GAMMA, GAIN, WHITE CLIP, SET-UP LEVEL, SCAN MODE, TRIGGER MODE, SHUTTER- SPEED, RANDOM TRIGGER through RS-232C Digital Serial Control are provided as standard on the *CV-M10RSE/RSC* model.

7. Operation and Mode Setting

SW1 switch on PK8080 located inside the camera and SW1 DIP switch on the rear panel are provided for mode settings such as shutter function, Random trigger, Gain, Gamma and Interlace and Non-Interlace scanning.

A. SW1 DIP switch on the rear panel (Factory setting : Normal Shutter Mode)

| | | | | |
|-----|-------------------------------------|-------------------------------------|----|--|
| OFF | <input checked="" type="checkbox"/> | | ON | #1 Shutter speed D2 |
| | <input checked="" type="checkbox"/> | | | #2 Shutter speed D1 |
| | <input checked="" type="checkbox"/> | | | #3 Shutter speed D0 |
| | | <input checked="" type="checkbox"/> | | #4 Random trigger shutter (ON: Normal mode) |
| | <input checked="" type="checkbox"/> | | | #5 Interlace system(ON:Non-interlace/OFF: Interlace) |
| | <input checked="" type="checkbox"/> | | | #6 Gamma (OFF: 1.0) |
| | <input checked="" type="checkbox"/> | | | #7 AGC |
| | <input checked="" type="checkbox"/> | | | #8 Gain |

Note : #4 See table on page 16.

#5 ON : Non-interlace output Video 1 only, OFF : Interlace output Video 1 & 2

B. SW1 * on PK8080 board inside camera available only on CV-M10BXE/BXC

- O N - (Factory setting : Normal Shutter Mode)

| | | | | |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | #1 Shutter mode : MD0 (OFF : up to 1/10000 sec. ON : up to 1/20000 sec. for EIA 1/25000 sec. for CCIR) |
| | | | | #2 NC |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | #3 Shutter mode : MD1 |
| | | | | #4 Shutter mode : MD2 |

-OFF-

#1 #2 #3 #4

Note : SW1 switch on PK8080 located inside the camera is provided only for shutter modes of “Shutter OFF”, “Normal Speed”, “High Speed” and “Long Time Exposure”. Do not touch this SW1 for the other purposes other than the settings of these shutter modes.

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1) Shutter “OFF”

Use SW1 switch on PK8080 board located inside camera.

| Mode | Pos. #1 | Pos. #2 | Pos. #3 | Pos. #4 |
|-------------|---------|---------|---------|---------|
| Shutter off | OFF | OFF | OFF | OFF |

Note 1 : In this “Shutter OFF” condition, the camera can not accept External Trigger. When you use External Trigger, refer to the following item 2) for Normal Speed Shutter “ON”, and set this SW1 to the original factory setting (Pos. #1, #2, #4 to OFF, and #3 to ON).

Note 2 : “Shutter OFF” condition can also be set by SW1 DIP switch on the rear panel. Refer to the following item 2) for Normal Speed Shutter "ON" and set Pos. #1, #2, #3 of SW1 DIP switch on the rear panel to OFF positions to make shutter speed 1/60 (EIA) or 1/50 (CCIR) which gives the same condition as “Shutter OFF”.

Shutter speed at “Shutter OFF”

| | Interlace [sec.] | Non-Interlace [sec.] |
|------|------------------|----------------------|
| EIA | 1/60 | 1/30 |
| CCIR | 1/50 | 1/25 |

#Random trigger does-not work at this mode.

2) Normal Speed Shutter “ON”

Use SW1 switch on PK8080 board located inside camera.

| Mode | Pos. #1 | Pos. #2 | Pos. #3 | Pos. #4 |
|---------|---------|---------|---------|---------|
| Shutter | OFF | OFF | ON | OFF |

To select the shutter speed, use SW1 DIP switch on the rear panel.

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| Shutter speed | | Pos.#1 | Pos.#2 | Pos.#3 |
|---------------|------|--------|--------|--------|
| EIA/VGA | CCIR | | | |
| 1/60 | 1/50 | OFF | OFF | OFF |
| 1/125 | | OFF | OFF | ON |
| 1/250 | | OFF | ON | OFF |
| 1/500 | | OFF | ON | ON |
| 1/1000 | | ON | OFF | OFF |
| 1/2000 | | ON | OFF | ON |
| 1/4000 | | ON | ON | OFF |
| 1/10000 | | ON | ON | ON |

3) High Speed Shutter “ON”

Use SW1 switch on PK8080 board located inside camera.

| MODE | Pos. #1 | Pos. #2 | Pos. #3 | Pos. #4 |
|--------------------|---------|---------|---------|---------|
| High Speed Shutter | ON | OFF | ON | OFF |

Note : CCIR version works in the mode of Random Trigger Shutter up to 1/917,000 sec. speed. Without random trigger, it works up to 1/10,000 sec. speed.

To select the shutter speed, use SW1 DIP switch on the rear panel.

| Shutter Speed | | Pos. #1 | Pos. #2 | Pos. #3 |
|---------------|----------|---------|---------|---------|
| EIA/VGA | CCIR | | | |
| 1/20000 | 1/25000 | OFF | OFF | OFF |
| 1/40000 | 1/50000 | OFF | OFF | ON |
| 1/60000 | 1/70000 | OFF | ON | OFF |
| 1/80000 | 1/90000 | OFF | ON | ON |
| 1/100000 | 1/125000 | ON | OFF | OFF |
| 1/200000 | 1/250000 | ON | OFF | ON |
| 1/400000 | 1/459000 | ON | ON | OFF |
| 1/800000 | 1/917000 | ON | ON | ON |

Note : It will take approx. 10 sec. until High Speed Shutter is in function.

4) Long Time Exposure “ON”

Use Swl switch on PK8080 board located inside camera.

| MODE | Pos. #1 | Pos. #2 | Pos. #3 | Pos. #4 |
|--------------------|---------|---------|---------|---------|
| LONG TIME EXPOSURE | OFF | OFF | OFF | ON |

To select the exposure time, use SW1 DIP switch on the rear panel.

| EXPOSURE TIME | Pos. #1 | Pos. #2 | Pos. #3 |
|---------------|---------|---------|---------|
| 2 FLD | OFF | OFF | OFF |
| 4 FLD | OFF | OFF | ON |
| 6 FLD | OFF | ON | OFF |
| 8 FLD | OFF | ON | ON |
| 10 FLD | ON | OFF | OFF |
| 12 FLD | ON | OFF | ON |
| 14 FLD | ON | ON | OFF |
| 16 FLD (max.) | ON | ON | ON |

1 FLD = EIA : 1/60 sec.
CCIR : 1/50 sec.

Note : The exposure-duration is indicated as “FLD” in the above list.
Setting to higher number of FLD by SW1 DIP switch on the rear panel leads to gain higher sensitivity.

Please note that Long-time Exposure does not work at Random Trigger mode.

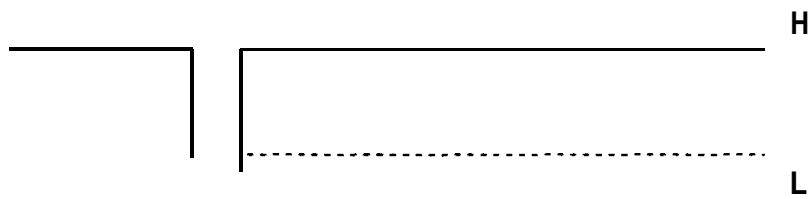
5) Random Trigger Mode

Use position # 4 on SW1 DIP switch on the rear panel to accept asynchronous random trigger shutter up to 1/800,000 sec. for EIA, and up to 1/917,000 sec. for CCIR

Note : Do not input Ext. VD signal at pin no.7 of 12P Multi connector, as it causes a failure in random trigger mode. (See 5. Pin Assignment)

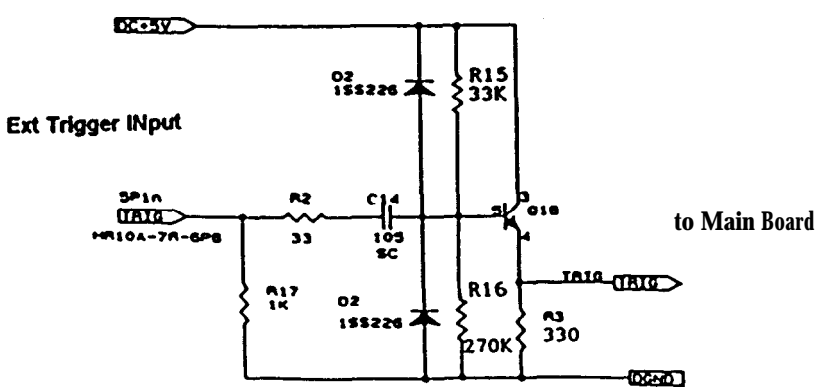
| MODE | Pos. #4 |
|---------------------|---------|
| NORMAL MODE | ON |
| RANDOM TRIGGER MODE | OFF |

- * Make sure that the input signal of Random Trigger has the following specifications.
- "LOW LEVEL" duration of the external trigger signal has to be more than 2 μ sec., and less than 1m sec. The random trigger is in function at the falling edge.



- The input level has to be at 4.0Vp-p \pm 1.0V.

(Input Circuit at camera side is described as follows.)



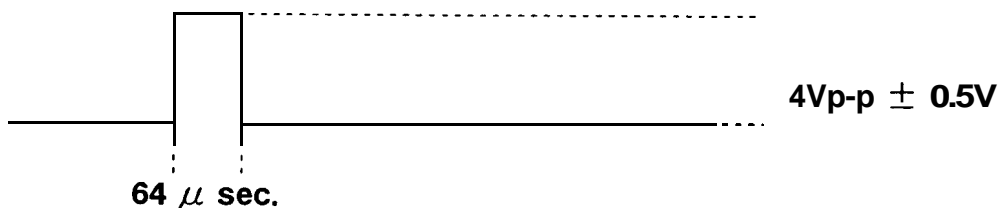
* WEN (VALID) Pulse Output

CV-M10 series camera generates and output WEN (Write ENable) pulse at pin no.6 of 6P Multi connector when ext. trigger pulse is input at pin no.5 of 6P Multi connector.

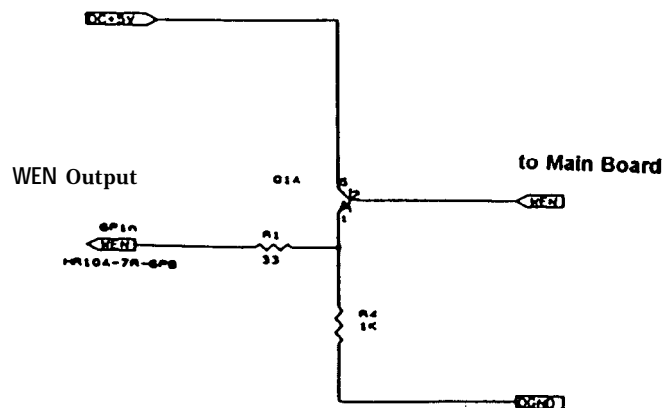
WEN pulse indicates a duration time of effective video signal generated by the operation in Random Trigger Mode and Long Time Exposure Mode, and it is useful to set a timing with frame grabber and other image processing equipment.

- At 2:1 interlace mode, the video signal will be output at VIDEO 1 after 7HD (ODD) and at VIDEO 2 after 8HD (EVEN) both from the rising edge of WEN pulse.

- At non-interlace mode, the video signal will be output after 14HD from the rising edge of WEN pulse.



(Output Circuite at camera side is described as follows.)



CV-M10

6) Gain Control

Use positions # 7 and # 8 on SW1 DIP switch on the rear panel.

| MODE | Pos. #7 | Pos. #8 |
|------------------------|---------|---------|
| FIX (Factory Preset) | OFF | OFF |
| Manual (on Rear Panel) | OFF | ON |
| AUTO | ON | OFF |

7) Interlace system

Use position # 5 on SW1 DIP switch on the rear panel.

| MODE | Pos. #5 |
|---------------|---------|
| INTERLACE | OFF |
| NON-INTERLACE | ON |

8) Gamma Correction

Use positions # 6 on SW1 DIP switch on the rear panel to set Gamma.

| MODE | Pos. #6 |
|--------------|---------|
| GAMMA=1.0 | OFF |
| GAMMA = 0.45 | ON |

Note : Above switching is effective only for Video 1.

Gamma is fixed with 1.0 for Video 2.

9) RS-232C Communication Mode (CV-M10RSE/RSC)

Use positions #7 & #8 on SW1 DIP switch on the rear panel to control with RS-232C.

| MODE | Pos. #7 | Pos. #8 |
|--------------------|---------|---------|
| Communication mode | ON | ON |

Note : Be sure to make the camera POWER OFF before the mode settings of Pos. #7 & #8. After setting SW1 DIP switch on the rear panel to ON positions, set the power ON to start the serial communication mode by RS-232C.

Any settings on SW1 on the rear panel will lose priority to the serial communication mode by RS-232C, except Gamma ON/OFF setting at Pos. #6.

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* Conditions of the serial communication are as follows.

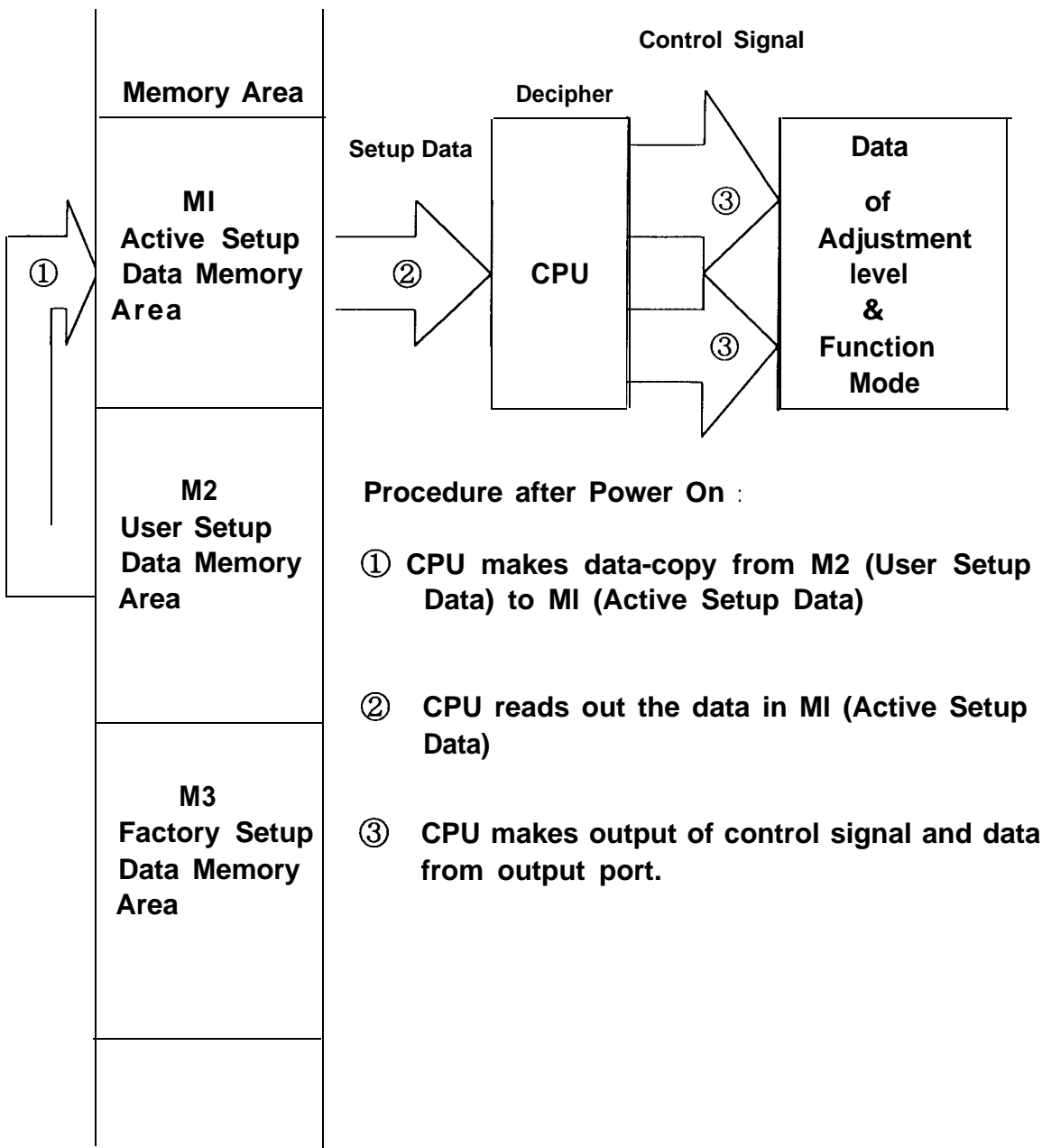
| | |
|---------------------------|----------|
| Communication Speed (B) : | 9600 |
| Data Bit (D) : | 8 |
| Parity Bit (P) : | none |
| Stop Bit (S) : | 1 |
| Flow Control (F) : | Xon/Xoff |

* Concept of Data Memory Area

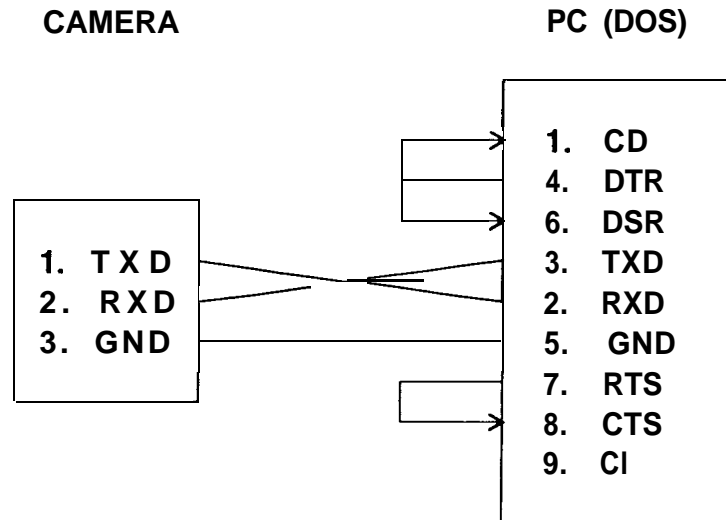
Micro processor installed in CV-M10RSE/RSC consists of the following 3 data memory area.

| Memory Area | |
|--|---|
| MI Active Setup Data Memory Area | MI Active setup data is temporarily memorized in MI when the camera is in function. Such data in MI controls the camera’s function. It will be erased when the camera’s power is “Off ”. |
| M2 User Setup Data Memory Area | M2 Memory area M2 where the user can implement the requested setup data. (Non-volatile memory) |
| M3 Factory Setup Data Memory Area | M3 Memory area M3 where the factory made implementation of the setup data. (Non-volatile memory) |
| | |

* Concept of Data Read-out at Power On.



* Connection with RS-232C



8. Ext./Int. HD/VD Operation & Pixel clock output

1) Change of HD/VD input impedance

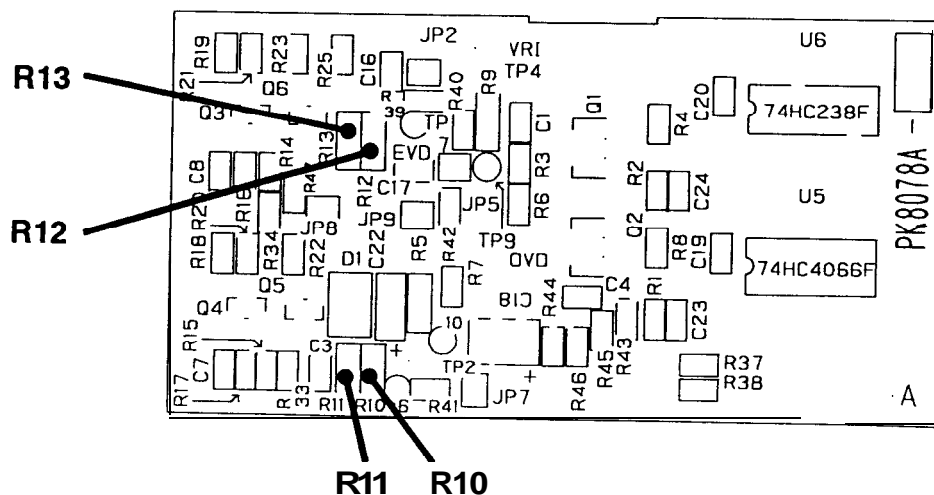
To change the input impedance, make the following modifications on PK8078 module.

- 75 Ω Termination Input (Factory setting) :

Mount 150 Ω register between R10 and R11 (HD input), and between R12 and R13 (VD input).

- TTL Input :

Dismount 150 Ω register between R10 and R11 (HD input), and between R12 and R13 (VD input).



2) Internal HD/VD output Mode

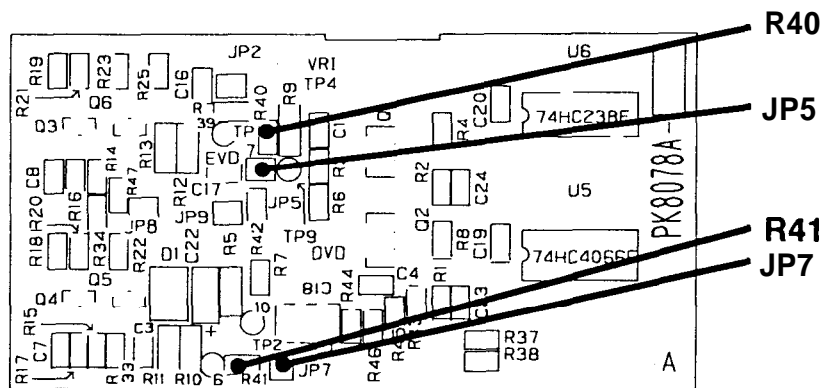
To change the Internal Sync Input Mode to Output Mode, make the following modifications on PK8078. (Factory setting is at the external sync input mode.)

- HD Output :

Make the jumper register at R41 opened, and the jumper at JP7 short-circuited.

- VD Output :

Make the jumper register at R40 opened, and the jumper at JP5 short-circuited. (VD Output)



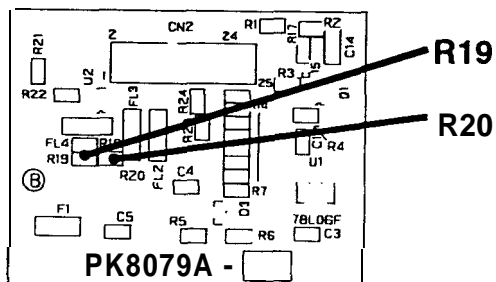
3) Pixel clock output

To use pixel clock output (4.0Vp-p), make the jumpers R19 short-circuited and R20 to open-circuited on PK8079 board. The position of jumper is described as follow.

Pixel clock pulse will be available at pin no.9 of 12P Multi connector. (see 5. Pin Assignment.)

Caution of Pixel clock output

1. Due to the output of pixel clock pulse, noise level may increase. Therefore, it is recommended to check the noise level at your system installation.
2. Video-2 output is not effective at this mode.



9. Adjustment of video signal output level

When the alignment of video output level is needed, take off the camera housing and adjust the potentiometers VR2 ~ VR8 located on the PK8080 board, measuring each levels at video output connector.

VR2 : To adjust the gain level of video output (1).

VR3 : To adjust the gain level of AGC of video output (1).

VR4 : To adjust the white level of video output (2).

VR5 : To adjust the white level of video output (1).

VR6 : To adjust the black level of video output (2).

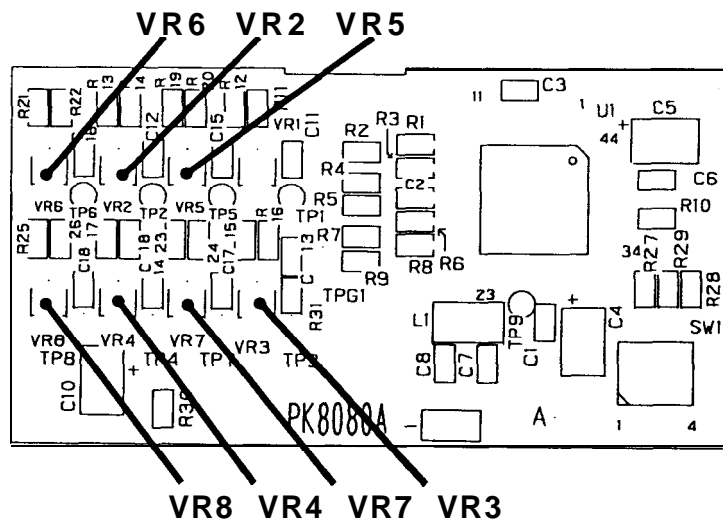
VR7 : To adjust the black level of video output (1).

VR8 : To adjust the gain level of video output (2).

Caution

1. Do not touch these potentiometers unless such adjustment is absolutely needed, since it will not be automatically reset to the original factory setting.
2. Do not touch VR1 potentiometer as it is for the adjustment of VSUB.

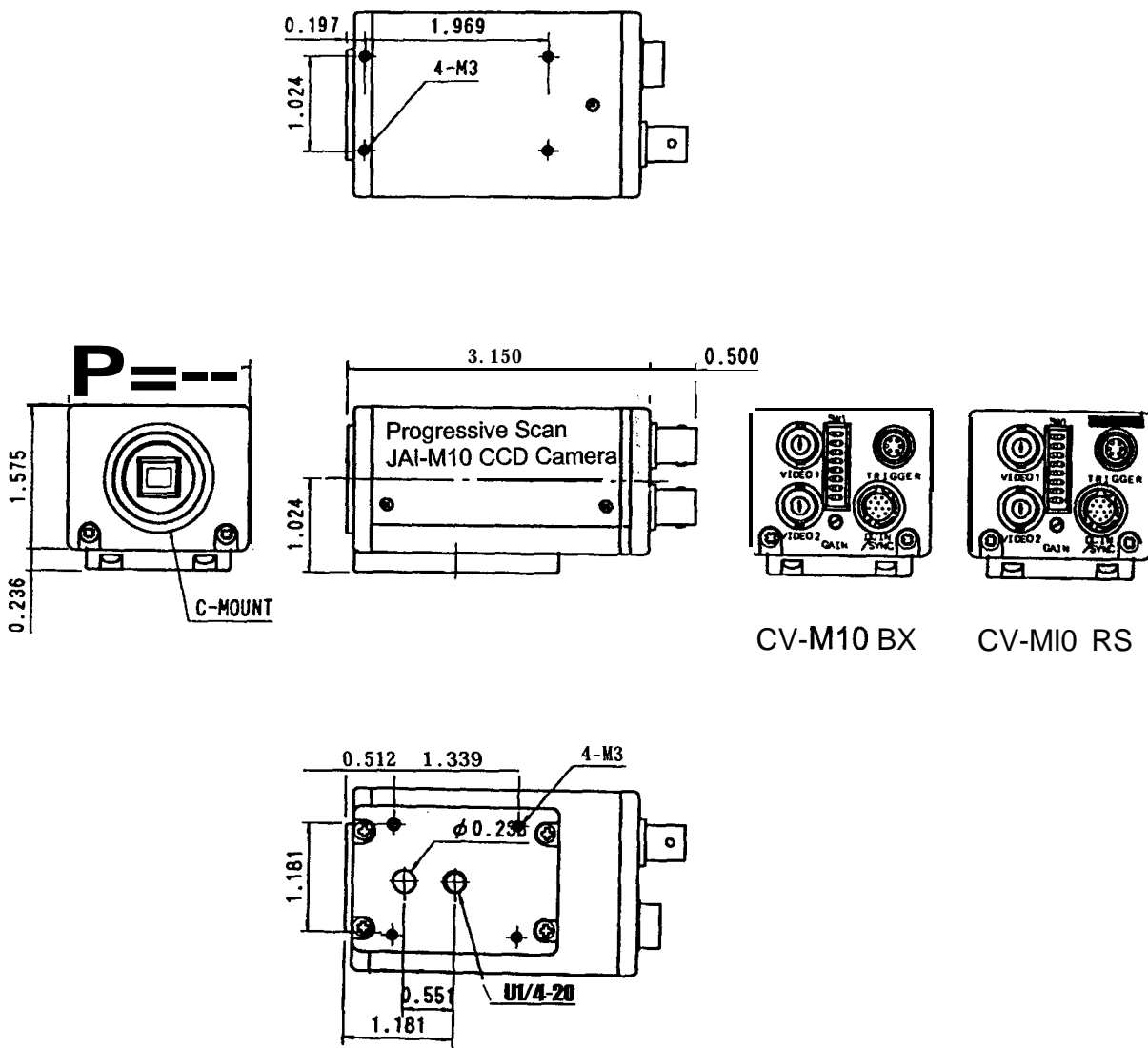
Position of VR2 ~ VR8 on PK8080 board is as follow.



JAI-M10

IO. External Appearance

(Unit : inch)



CV-M10 BX

CV-M10 RS

CV-M10

11. Specifications (CV-M10 series Rev.B)

| | |
|---|--|
| CCD Sensor | 1/2" Interline-Transfer Type |
| Number of Elements | 659 (H) x 494 (V) EIA/VGA corresponded 762 (H) x 562 (V) CCIR |
| Cell Size (Square) | EIA: 9.9 μ m(H) x 9.9 μ m(V) CCIR: 8.3 μ m(H)x8.3 μ m(V) |
| Chip size | EIA/CCIR : 6.10 x 6.33mm |
| Scanning Frequency | EIA : H 15.734KHz, V. 60Hz CCIR: H. 15.625KHz, V. 50Hz |
| Scanning System | 1) Non-interlace read-out to scan full 525 lines in 1/30 sec. In EIA 625 lines in 1/25 sec. in CCIR 2) Interlace read-out, dual channels, 1/60 sec. frequency in EIA 1/50 sec. frequency In CCIR 'OUTPUT 1" for Field image in ODD-EVEN-ODD sequence 'OUTPUT 2" for Field Image in EVEN-ODD-EVEN sequence |
| Resolution | EIA : H. 530 lines, V. 400 lines CCIR : H. 550 lines, V. 400 lines |
| S/N Ratio | EIA : 56dB or more (AGC OFF, Gamma=1.0) CCIR: 55 dB or more (AGC OFF, Gamma=1.0) |
| Synchronization | 1) Ext HD/VD input (4.0Vp-p \pm 1.0V, 75 Ω terminated) 2) Ext. trigger Input (4.0Vp-p \pm 1.0V) 3) int. HD/VD output (4.0Vp-p \pm 1.0V, 75 Ω terminated) |
| Electronic Shutter | Normal speed : EIA 1/60 ~ 1/10,000 CCIR 1/50 ~ 1/10,000 High speed : EIA 1/20,000 ~ 1/800,000 Long-time exposure : 2 FLD ~ 16 FLD max.(1FLD=1/60 or 1/50 sec.) |
| Random Trigger Shutter | Normal speed : EIA 1/60 ~ 1/10,000 CCIR 1/50 ~ 1/10,000 High speed : EIA 1/20,000 ~ 1/800,000 CCIR 1/25,000 ~ 1/917,000 |
| Digital Serial Control (JAI-M10RSE/RSC only) | RS-232C Digital Serial Communication to control functions such as Gain, White Clip, Shutter, Random Trigger, etc. |
| Environment | Temperature : -10 $^{\circ}$ C ~ +50 $^{\circ}$ C (14 $^{\circ}$ F ~ 122 $^{\circ}$ F) Humidity : 20 ~ 80 % (Non-condensed) |
| Power Requirement | +12VDC \pm 10% JAI-M10BX = 2.2W, JAI-M10RS = 2.5W |
| Lens Mount | C-Mount |
| Weight | 245g (0.547lbs approx) |
| Dimensions | 50Wx 40H x 80Dmm (1.97"x1.57"x3.15"approx.) |

Note : Above specifications are subject to change without notice.

Memo :

Printed in Japan

PJM10 12971 B(E)