

High resolution progressive scan monochrome CCD camera
(Frame shutter)

KP-F100UV

Specifications (preliminary)

1. Outline

Hitachi's KP-F100UV is a 1/2-inch size black and white CCD camera designed for high resolution and versatile functions. And this camera has sensitivity in an ultra violet region. (230nm~380nm) Progressive scan with full pixel independent readout and full frame shutter provide images of unparalleled quality at 15 frames per second non-interlaced output.

Effective picture elements number 1.45 million, while the broad array of functions includes digital output, multi-step electronic shutter, HD/VD external sync and frame on demand

2. Outstanding features

(1) High resolution

High grade CCD with 1392 (H) × 1040 (V) effective pixels.

(2) High gain

It can be set up to 24dB (maximum) by RS-232C control. . . . (Rough 18dB, Fine 50)
Factory setting is 18dB.

(3) Frame shutter

The frame shutter function improves vertical resolution of moving objects..

(4) Multistep electronic shutter

The shutter speed can be selected in 8 steps from 1/30th to 1/50,000th of a second.

(5) Frame on demand

An external trigger signal input can be used to capture an image at a desired timing for instant view or processing. The capture time can be adjusted by the trigger and shutter.

(6) The self-contained CPU permits using RS-232C control for setting each function.

The functions can also be set from rear panel switches.

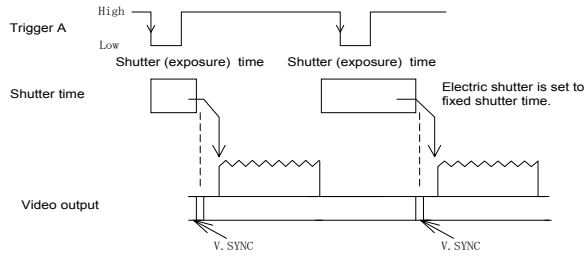
(7) Digital output

An EIA-644 digital output is provided.

3. Specifications

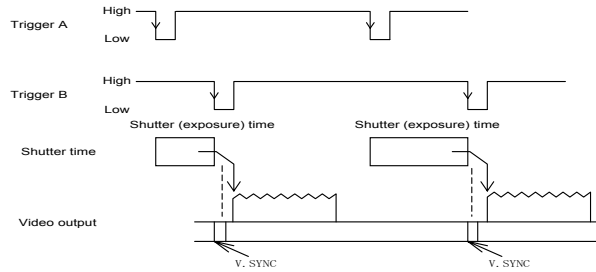
(1) Pickup element	1/2-inch interline CCD
Total pixels	1434 (H) × 1050(V)
Effective pixels	1392 (H) × 1040 (V)
Pixel pitch	4.65 (H) × 4.65 (V) μ m (square lattice)
(2) Imaging area	7.60 (H) × 6.20 (V) mm
(3) Scanning system	Non-interlaced
(4) Aspect ratio	4 :3
(5) Frame rate	15frames/second (full pixel readout) 60fps (4× accelerated mode) Factory setting is 15 fps. Selected by rear panel switch.
(6) Horizontal scanning frequency	15.998 kHz
(7) Vertical scanning frequency	15 Hz
(8) Synchronization	Internal/external (automatic switching)
(9) Lens mount	C mount
(10) Flange focal distance	17.526 mm
(11) Video output	Digital output or analog output for image checking Analog output (option)
Digital output	EIA-644
Note: Maximum digital out cable length is 2 meters.	Data : single channel 10 bits, 28.636 MHz
(12) External sync input	HD/VD negative Level: see page 11(External signal level) Input impedance: 1 k Ω Frequency deviation: \pm 1%
(13) Electronic shutter speed	Selectable by external switches: Off (frame rate), 1/30, 1/125, 1/250, 1/1000, 1/2000, 1/4000, 1/10000 1/50000 second. Off: Normal exposure (frame rate) Set by external switch; factory setting is off (1/15 second).
(14) Gamma compensation	$\gamma = 1$
(15) Frame on demand	External switch setting on/off and modes (fixed shutter two trigger and one trigger). Factory setting is all off.

Fixed shutter mode



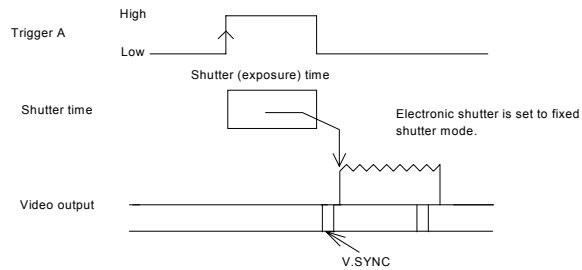
Fixed shutter mode

Two trigger mode



Two trigger mode

One trigger mode



(16) Power supply voltage

12 ± 1 VDC

(17) Current consumption

Approx. 350 mA

(18) Ambient, operating
Ambient, storage

0 to + 40 °C(+32 to ; 104 F), less than 90 % RH
-10 to + 50 °C(+14 to +122 F), less than 70 % RH

Note: If operated continuously, be sure to use at less than +40 °C(104 F) for long term stable performance.

(19) Vibration endurance

29.42 m/s² (3 directions, 30 minutes each)

(20) Shock endurance

294.2 m/s² (vertical, horizontal, once each face)

(21) External dimensions

44 (W) × 44 (H) × 78 (D) mm

(22) Mass

Approx. 180 g

(23) RS-232C control

(a) Signal system

Control system	Start-stop synchronization system
Transmission rate	9600 bps
Data length	8 bits
Start bit	1
Stop bits	2
Parity	None
Bit transfer	LSB first

(b) Communications control system

Full control by remote control software, data send/receive by text data transfer to camera microprocessor (BSC system handshake)

(c) Control items

1. Shutter speed (1/30, 1/125, 1/250, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second)
2. FD (frame on demand) On/off
3. Mode Fixed shutter, two trigger, one trigger
4. V-binning On/off
5. Gain
ROUGH 0,9,18dB
FINE Variable in 50 steps
6. Black level Variable in 50 steps
7. Input trigger Negative/Positive

4. Composition

- (1) Camera (with infrared blocking filter)
- (2) Operating instructions

5. Optional accessories

- (1) Tripod adaptor TA-M1
- (2) 12 pin plug HR10A-10P-12S(01)
- (3) D. OUT connector (26 pins) DX30AM-26P or equivalent
- (4) Junction box JU-M1A JU-F1*

- (5) Dummy glass (AR coated) ARC1214
- (6) Camera cable

	Molded type	Assembly type	Shield type
2 m	C-201-KSM	C-201KS	C-201KSS
5 m	C-501KSM	C-501KS	C-501KSS
10 m	C-102KSM	C-102KS	C-102KSS

Note : Assembly type made to order

In Europe, use the Shield type

* 12-pin connector output pin differences

Pin	JU-F1	KP-F100UV output
4	VIDEO 1	VIDEO
6	HD/TRIG-B	EXTHD
9	VIDEO 2	TRIG-B

6. DC input and sync connections

(1) Connections to DC IN and SYNC

Pin No.	Int. sync	Ext. sync			
		Ext. HD/VD	Frame on demand		
			Fixed shutter	Two trigger	One trigger
1	GND	GND	GND	GND	GND
2	+12V	+12V	+12V	+12V	+12V
3	GND	GND	GND	GND	GND
4	VIDEO	VIDEO	VIDEO	VIDEO	VIDEO
5	_____	EXTHD (GND)	_____	_____	_____
6	_____	EXTHD (SIGNAL)	EXTHD (SIGNAL)	EXTHD (SIGNAL)	_____
7	_____	EXTVD (SIGNAL)	TRIG-A (SIGNAL)	TRIG-A (SIGNAL)	TRIG-A (SIGNAL)
8	_____	_____	_____	TRIG-B (GND)	_____
9	_____	_____	_____	TRIG-B (SIGNAL)	_____
10	GND	GND	GND	GND	GND
11	+12V	+12V	+12V	+12V	+12V
12	_____	EXTVD (GND)	TRIG-A (GND)	TRIG-A (GND)	TRIG-A (GND)

Connector (camera side) : Hirose HR10A-10R-12PB(01)

Plug (matching cable plug) : Hirose HR10A-10P-12S (01)

(2) Signal connections to D. OUT (26 pin)

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No..	Signal
1	DATA 0-H	8	DATA 3-L	15	DATA 7-H	22	VD-L
2	DATA 0-L	9	DATA 4-H	16	DATA 7-L	23	HD-H
3	DATA 1-H	10	DATA 4-L	17	DATA 8-H	24	HD-L
4	DATA 1-L	11	DATA 5-H	18	DATA 8-L	25	CLK-H
5	DATA 2-H	12	DATA 5-L	19	DATA 9-H	26	CLK-L
6	DATA 2-L	13	DATA 6-H	20	DATA 9-L		
7	DATA 3-H	14	DATA 6-L	21	VD-H		

Connector (camera side) : Hirose DX10GM-26S or an equivalent
 Plug(matching cable plug) : Hirose DX30AM-26P or an equivalent
 Cover : Hirose DX30M-26CV or an equivalent

The digital out cable should be comprised of a twisted pair of wires having 100 Ω characteristic impedance and an outer sheath shield type conductor. Connect the shield (ground) of the digital out cable to the ground terminal of the video equipment, frame grabber, etc.

(3) Remote (RS-232C control) cable pin connections

(Connect the cable between the camera Remote connector and the personal computer serial interface connector (D-SUB 9 pin).

Pin no.	Signal name
1	-
2	RD
3	TD
4	Manual/remote
5	Ground
6	-

Connector (camera) HR10-7R-6SA (Hirose) or equivalent
 Plug (cable matching plug) HR10A-7P-6P (Hirose) or equivalent

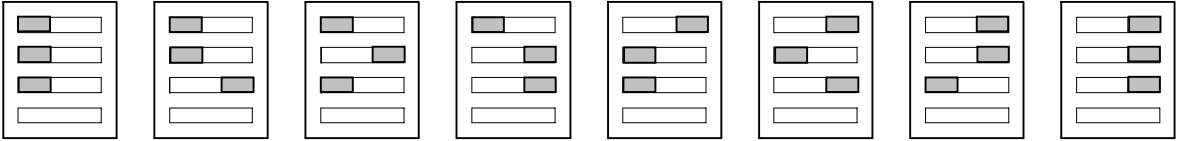
Notes: At the camera Remote plug, connect pin 4 Manual/remote and pin 5 ground.

At the computer serial interface connector (D-SUB), short pins 7 (RTS) and 8 (CTS).

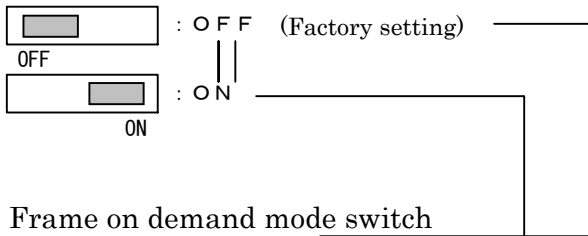
7. Rear panel switches

The rear panel includes switches for electronic shutter data, readout rate, and field on demand on/off and mode switches.

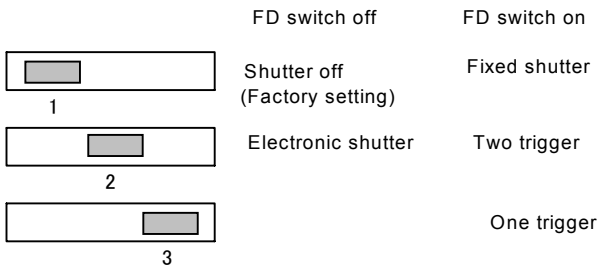
(1) Electronic shutter switches



(2) Frame on demand (FD) on/off switch



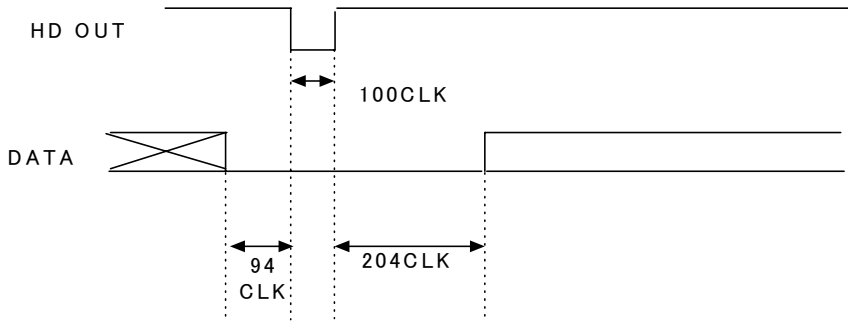
(3) Frame on demand mode switch



8. Input/output signal levels and timing

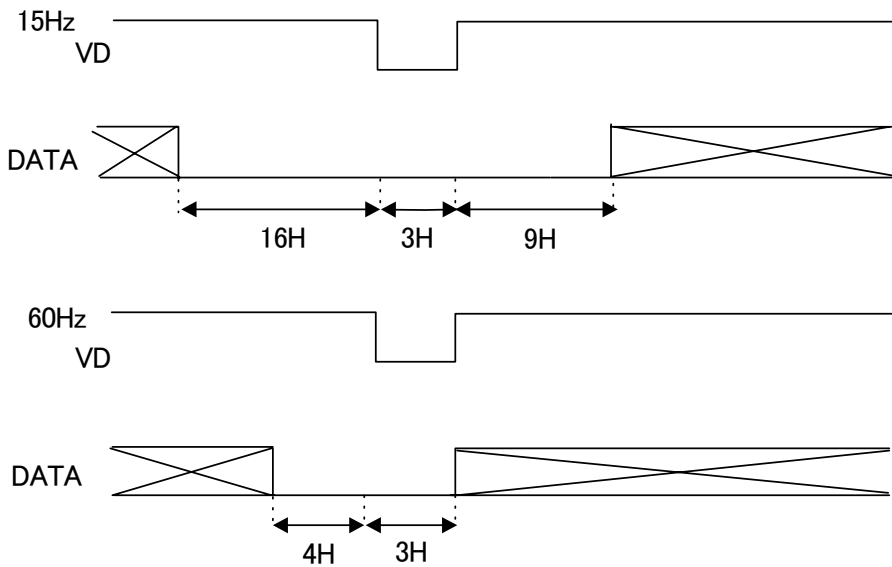
(1) Digital output

H sync phase relationship

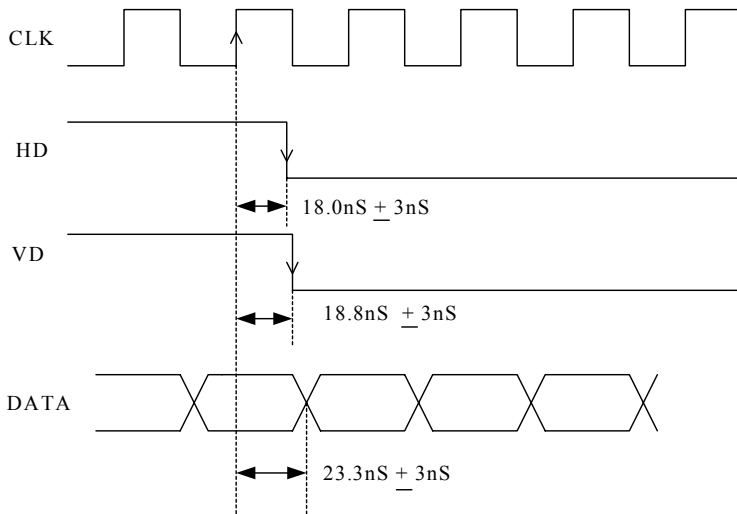


HD OUT is obtained at EIA-644 rating from the digital connector pins 23 and 24.
 $HD = 15.998\text{kHz} = 1790\text{CLK}$

V sync phase relationship



CLK,HD,VD,DATA phase relationship



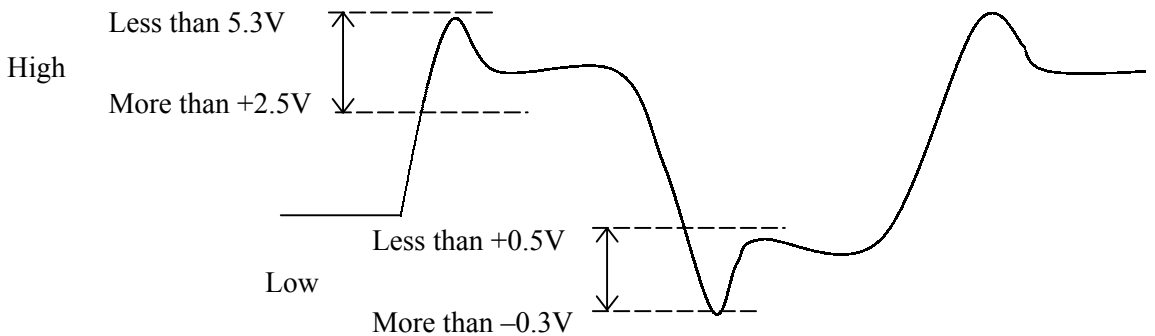
Level: EIA-644A (Hi: more than 1.41V, Low: less than 1.075V)



External signal level

Condition of external signal input

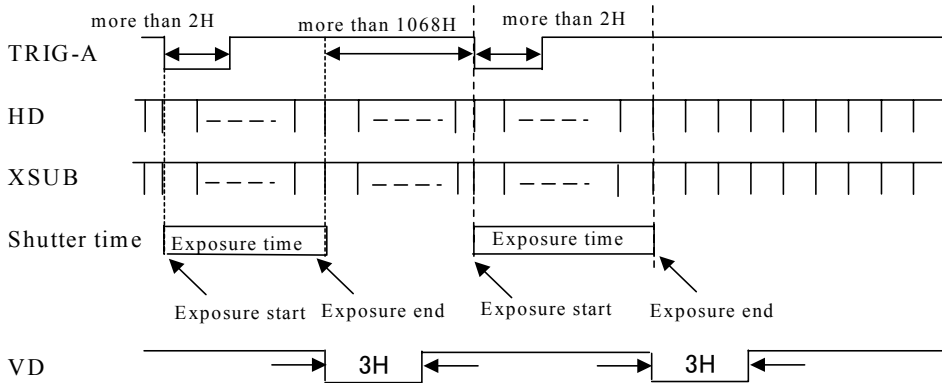
Ringing of external signal input(Trig-A / Trig-B / Ext-HD / Ext-VD) : 0.3V or less



External signal input waveform

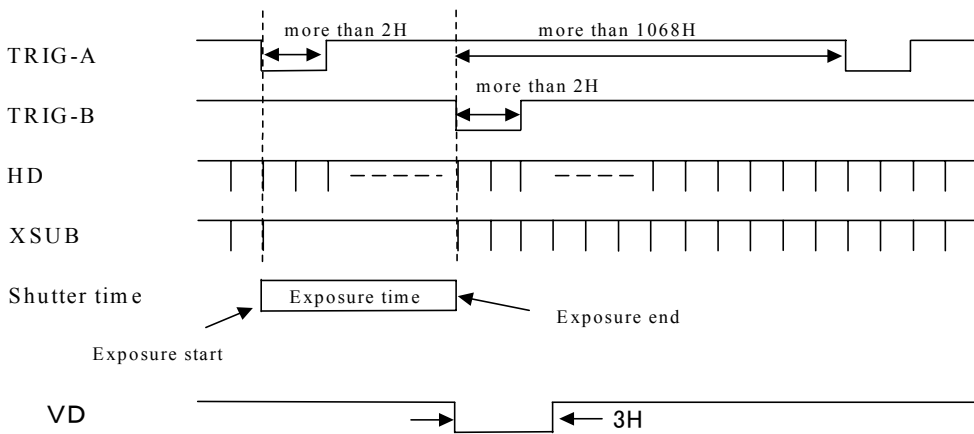
(2)TRIG-A input and HD & VD phase during Fixed shutter mode

TRIG-A level: see page 11(External signal level)

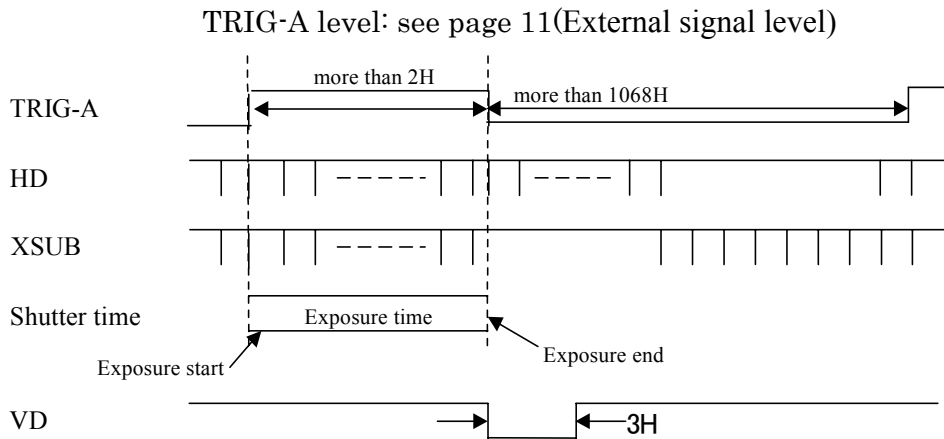


(3)TRIG-A & B input phase and HD & VD phase during Two trigger mode

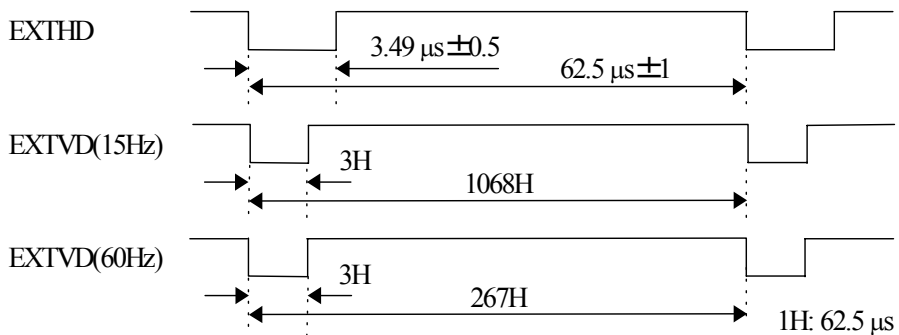
TRIG-A & B level: see page 11(External signal level)



(4) One trigger mode



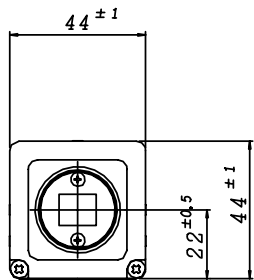
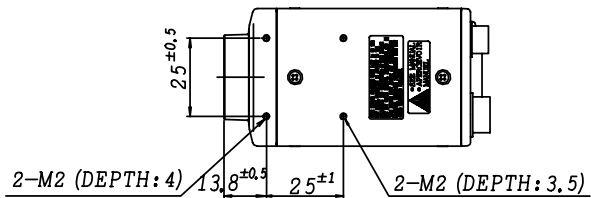
(5) External HD & VD input levels and phase
level: see page 11(External signal level)



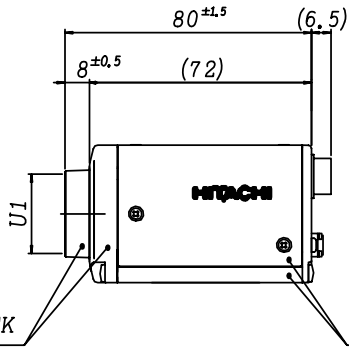
Align falling edges of external HD and VD.
VD output is delayed 2H compared to EXTVD

KP-F100UV

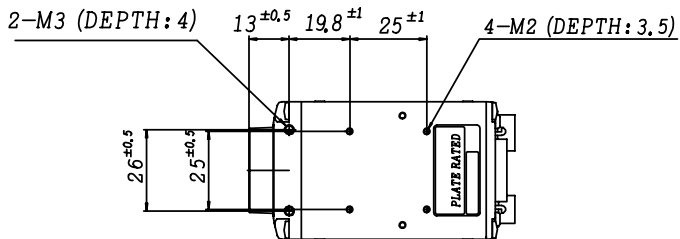
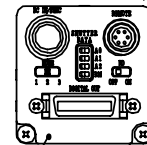
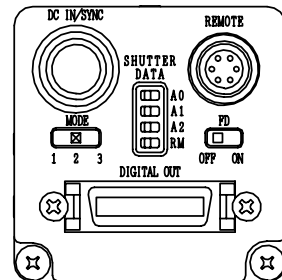
TENTATIVE



COLOR : BLACK



COLOR : BLACK



SCALE : NTS

UNIT : mm

MASS : APPROX 180 g