

# CCD カメラ

## Progressive Scan Type

## Black and White Camera

# KP-F100B

## フレーム・オン・デマンド

### 取扱説明書

このたびは日立 KP-F100B 白黒 CCD カメラをお買い上げいただき誠にありがとうございます。ご使用前にこの取扱説明書をよくお読みいただき、正しくお使いください。

### OPERATION MANUAL

Please read this operation manual carefully for proper operation, and keep it for future reference.

## 株式会社 日立国際電気

# Hitachi Kokusai Electric Inc.

- 保証期間経過後の修理につきまして修理可能な場合に限り有償にて修理いたします。
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  - 画像歪み(CCD)の焼付
  - 高温環境(40℃以上)での連続使用による故障
  - 他の機器から受けた障害(たとえば周囲の強力な磁界など)
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### KP-F100B for U. S. A.

These products have been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. These equipments generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of these products in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**WARNING**  
Changes or modifications not expressly approved by HITACHI KOKUSAI ELECTRIC responsible for compliance could void the user's authority to operate the equipment.

### KP-F100B for Canada

These products do not exceed the class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations.

Le présent appareil n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministre des communications du Canada.

### Phenomena inherent to CCD imaging device

Following are the phenomena inherent to a CCD imaging device, and not defects

- Smear and blooming**  
When strong light (lamp, fluorescent lamp, reflected light, etc.) is shot, pale bands are displayed vertically above and below the light.  
In this case, change the angle of the camera so that such strong light does not enter the camera through the lens.
- Fixed pattern noise**  
When the camera is operated in a high temperature, fixed pattern noise may appear on the entire screen.
- Moire**  
When fine patterns are shot, moire may be displayed.

Install the cameras as far as possible from each other or operate the cameras by an external sync signal.

### e. Fixing of camera

When a heavy lens is used, or when excessive shock or vibration is applied, fix the lens to the equipment, too.

### f. Handling

- Use a clean site when installing the lens or other attachment.
- Use care not to tilt the camera when attaching the lens. Also observe absence of foreign matter and scratches on the lens mount.

## GENERAL

Hitachi's KP-F100B is a 2/3-inch size black and white CCD camera designed for high resolution and versatile functions.

- High resolution : 1392 (H) × 1040 (V) effective pixels
- RS-232C control
- Digital output is EIA-644
- Frame shutter function and multiple electronic shutter
- Positive or negative select switch for Input trigger
- Frame-on-Demand function

## COMPOSITION

Standard composition

(1)Camera (with infrared cut filter)

(2)Operation manual

### Optional accessories

- |                                |                          |
|--------------------------------|--------------------------|
| (1) Tripod adaptor             | TA-M1                    |
| (2) 1/2 pin plug               | HR10A-10P-12S(01)        |
| (3) D. OUT connector (26 pins) | DX30AM-26P or equivalent |
| (4) AC adaptor                 | AP-190                   |
| (5) Dummy glass (AR coated)    | ARC1214                  |
| (6) Junction box               | JU-F1*                   |
| (7) Camera cable               |                          |

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

Note: In the region CE Marking required, use the Shield type cable.

### \*12-pin connector output pin definitions

Pin	JU-F1	KP-F100B output
4	VIDEO 1	VIDEO
6	HD/TRIG-B	HD(Input)
9	VIDEO 2	TRIG-B

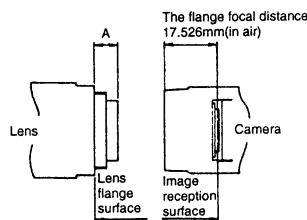
## OPTICAL SYSTEM

Flange focal distance

Image size: 2/3-inch

The flange focal distance is 17.526mm (in air)

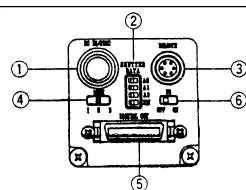
Flange focal distance cannot be adjusted.



### Note:

Select such a lens as the length (A) from the flange surface of the lens to the end of the screw side is 8mm or less.

## NAME OF EACH SECTION



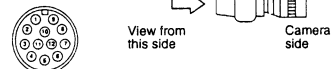
- DC IN/SYNC connector  
Connector for DC 12V supply, external SYNC input, and Video signal output.
- SHUTTER DATA switch  
Use these switches to set a shutter speed.
- REMOTE connector  
Connector for RS-232C control.
- MODE switch  
Set to electric shutter ON/OFF, or fixed shutter, one or two trigger mode.
- DIGITAL OUT connector  
RS-644 digital data output.
- FD switch  
Set to on to use Frame On Demand function.

## SIGNAL CONNECTION TO CONNECTOR

### (1) Signal connections to DC IN and SYNC(DC IN/SYNC)

Pin No.	Internal SYNC mode	HV/VD	External SYNC mode			
			Field shutter	Frame-On-Demand	TWO trigger	ONE trigger
1	GND	GND	GND	GND	GND	GND
2	+12V	+12V	+12V	+12V	+12V	+12V
3	GND	GND	GND	GND	GND	GND
4	VIDEO	VIDEO	VIDEO	VIDEO	VIDEO	VIDEO
5	GND	EXTV(D/GND)	GND	GND	GND	GND
6	—	EXTV(D/GND)	—	—	—	—
7	—	EXTV(D/SIGNAL)	TRIG-A (SIGNAL)	TRIG-A (SIGNAL)	TRIG-A (SIGNAL)	TRIG-A (SIGNAL)
8	GND	GND	GND	TRIG-B (GND)	GND	GND
9	—	—	—	TRIG-B (SIGNAL)	—	—
10	GND	GND	GND	GND	GND	GND
11	+12V	+12V	+12V	+12V	+12V	+12V
12	GND	EXTV(D/GND)	TRIG-A(GND)	TRIG-A(GND)	TRIG-A(GND)	TRIG-A(GND)

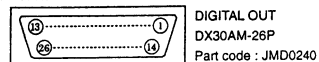
DC IN/SYNC  
HR10A-10P-12S(01)  
Product : 23810AX



### (2) Signal connection to DIGITAL OUT(S)

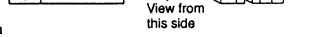
Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	DATA0-H	8	DATA3-L	15	DATA7-H	22	VD-L
2	DATA0-L	9	DATA4-H	16	DATA7-L	23	HD-H
3	DATA1-H	10	DATA4-L	17	DATA8-H	24	HD-L
4	DATA1-L	11	DATA5-H	18	DATA8-L	25	CLK-H
5	DATA2-H	12	DATA5-L	19	DATA9-H	26	CLK-L
6	DATA2-L	13	DATA6-H	20	DATA9-L	Shield	GND
7	DATA3-H	14	DATA6-L	21	VD-H		

H: High, L: Low  
The digital out pin is not grounded. Connect the ground terminal of a frame grabber or other equipment to the shield of the digital out cable. 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.



### (3) Signal connection to REMOTE connector

Pin No.	Signal
1	—
2	RD
3	TD
4	MANU/REM
5	GND
6	—



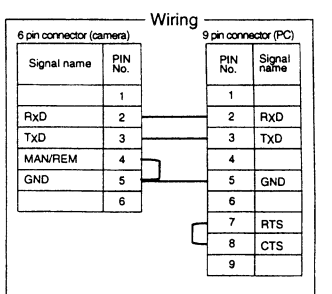
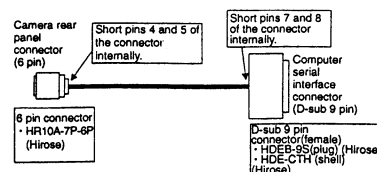
- Connect the cable between the camera Remote connector and the personal computer serial interface connector (D-SUB 9 pin).
- Notes: At the camera Remote plug, connect pin 4 Manual/remote and pin 5 ground.  
At the computer serial interface connector (D-SUB), short pins 7 (RTS) and 8 (CTS). In the region CE Marking required, use the Shield type cable.

## REMOTE CABLE WIRING

The cable indicated below is used for remotely controlling the camera.

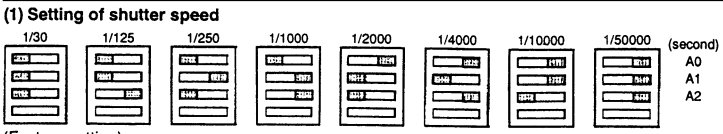
Connect (camera side): HR10-7R-6SA (hirose) or equivalent  
Plug (cable side) : HR10A-7P-6P (Hirose) or equivalent

**Note:** 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).



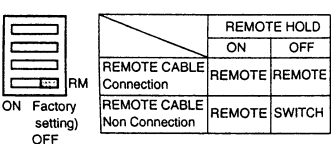
**Note:** Tx/D: Transmit data from PC to camera.  
Rx/D: Transmit data from camera to PC.  
In the region CE marking required, use the Shield type cable.

## (1) Setting of shutter speed

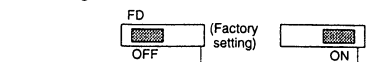


(Factory setting)

## (2) REMOTE HOLD



## (3) Setting of Frame-On-Demand ON/OFF

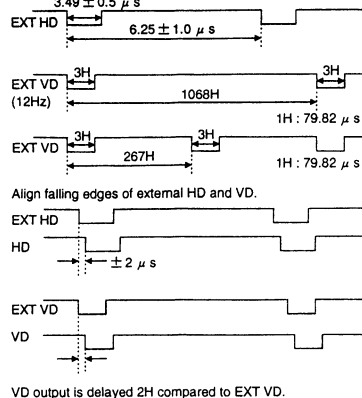


## (4) SETTING OF MODE

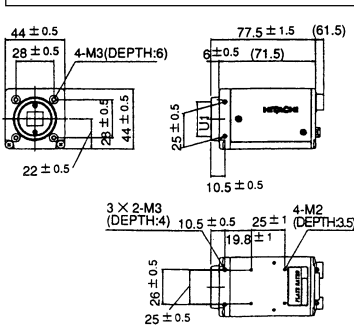
MODE	FD switch: OFF	FD switch: ON
1	1: Electronic shutter OFF	1: Fixed shutter
2	2: Electronic shutter ON	2: TWO trigger
3	3: _____	3: ONE trigger

## (5) External HD & VD input levels and phase

Level: Please refer to the CONDITION OF EXTERNAL SIGNAL INPUT.



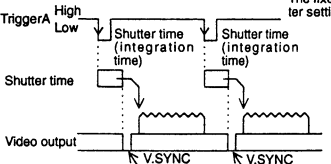
## EXTERNAL VIEW



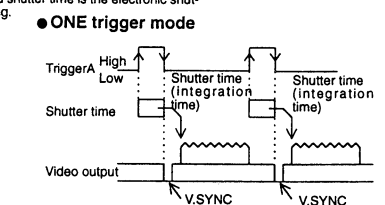
**Caution**  
When a heavy lens is used, or when excessive shock or vibration is applied, fix the lens to the equipment, too.

## FRAME-ON-DEMAND-FUNCTION

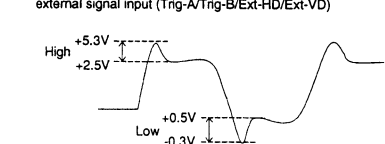
### Fixed shutter mode



### ONE trigger mode



### Condition of external signal input

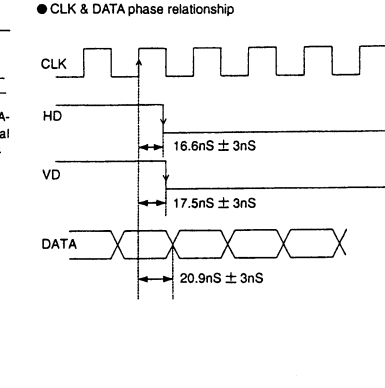
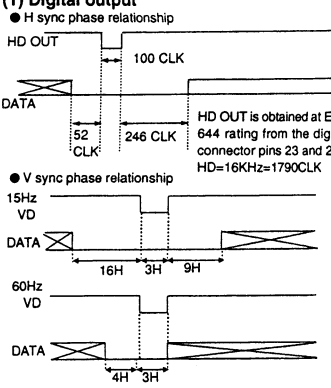


## SPECIFICATIONS

- (1) Pickup element: 2/3-inch interline CCD
- Total pixels: 1432 (H) × 1050 (V)
- Effective pixels: 1392 (H) × 1040 (V)
- Pixel pitch: 6.45 (H) × 6.45 (V) μm (square lattice)
- (2) Imaging area: 8.98 (H) × 6.71 (V) mm
- (3) Scanning system: Non-interlaced
- (4) Aspect ratio: 4:3
- (5) Frame rate: 15 frames/second (full pixel readout)
- 60 fps (4 × accelerated mode)
- (6) Horizontal scanning frequency: 16 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
- Digital output: EIA-644
- Note: Maximum digital output cable length is 10 meters.
- Data: Single channel 10 bits, 28.64MHz
- (12) External sync input: HD/VD negative Please refer to the CONDITION OF EXTERNAL SIGNAL INPUT
- Input impedance: 1 k Ω
- Frequency deviation: ± 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.
- Set by external switch..
- (14) Gamma compensation: γ = 1
- (15) Frame-on-demand: External switch setting on/off and modes (fixed shutter, two trigger, and one trigger).
- (16) Power supply voltage: 12 ± 1 VDC
- (17) Current consumption: Approx. 320 mA

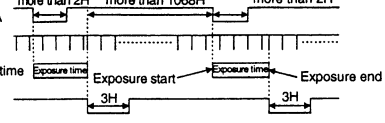
## INPUT/OUTPUT SIGNAL LEVELS AND TIMING

### (1) Digital output



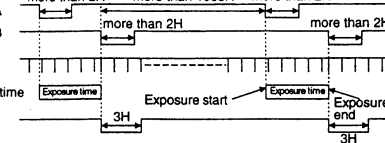
### (2) TRIG-A input and HD & VD phase during Fixed shutter mode

Transmit TRIG-A at Please refer to the CONDITION OF EXTERNAL SIGNAL INPUT.



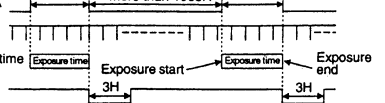
### (3) TRIG-A & B input phase and HD & VD phase during Two trigger mode

Transmit TRIG-A & B at Please refer to the CONDITION OF EXTERNAL SIGNAL INPUT.



### (4) One trigger mode

Transmit TRIG-A at Please refer to the CONDITION OF EXTERNAL SIGNAL INPUT.



- (18) Ambient, operating: 0 to +40 °C (+32 to ; 104 F), less than 90 % RH
- Ambient, storage: -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: 3G (3 directions, 30 minutes each)
- (20) Shock endurance: 30G (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: Start-stop synchronization system
- Control system: Start-stop synchronization system
- Transmission rate: 9600 bps
- Data length: 8 bits
- Start bit: 1 bit
- Stop bits: 2 bit
- 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. 4 × accelerated mode: On/Off
- 5. Gain: Variable in 50 steps
- 6. Black level: Variable in 50 steps
- 7. Input trigger: Negative/Positive

\* Specifications are subject to change without notice.

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