

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.

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 - (1) 使用上の誤りにより生じた故障
 - (2) 弊社のサービスマン以外の手による修理または改造により生じた故障
 - (3) 撮像素子(CCD)の焼付
 - (4) 高温環境(40℃以上)での連続使用による故障
 - (5) 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)
 - (6) お買上げ後の移動、輸送、落下冠水などによる故障
 - (7) 火災、爆発、ガス害、異常電圧、地震、落雷、風水害、その他天災地変などによる故障
 - (8) お客様のご要望により出張サービスを行った場合の出張料金
 - (9) 本保証書にお買上げ年月日、販売店名の記入がない場合、あるいは字句が書き替えられた場合
 - (10) この保証書のご提示がない場合
- 本保証書は日本国内においてのみ有効です。
This warranty is valid only in Japan.

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 ministère des communications du Canada.

NOTES TO USERS

a. Power supply

Connect $12V \pm 1V$ DC from an external power supply.

b. Cleaning

- Do not touch the glass surface of the sensor to avoid dirt and scratches.
- Use a manual type blower or lens brush to clear debris from the lens and glass. Carefully wipe the glass with a cotton swab to avoid scratches.
- Even when not using the camera, attach the lens or seal to protect the glass from soiling or damage.

c. To protect camera

- Do not use or store the camera under direct sunlight, in environments exposed to rain, or snow, or at a place exposed to flammable or corrosive gas.
- The camera operates in the temperature range between -0 and $40C$.

If the camera is used or left at a high temperature ($40C$ or more) for hours, the life of the camera may be shortened. When using the camera continuously for hours, avoid using the camera in such a high temperature or high humidity.

- Do not drop the camera. Do not apply strong shock or vibration to the camera.
- Before connecting or disconnecting a connector, turn off the camera. Be sure to hold the connector body to connect or disconnect the connector.

d. Arrangement of camera

When several cameras are installed very close with each other, the cameras may interfere with each other to cause noise.

Phenomena inherent to CCD imaging device

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

1) 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.

2) Fixed pattern noise

When the camera is operated in a high temperature, fixed pattern noise may appear on the entire screen.

3) 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 : $1392 (H) \times 1040 (V)$ 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) 12 pin plug | HR10A-10P-12S(01) |
| (3) D. OUT connector (26 pins) | DX30AM-26P or equivalent |
| (4) AC adaptor | AP-130 |
| (5) Dummy glass (AR coated) | ARC1214 |
| (6) Junction box | JU-F1* |
| (7) Camera cable | |

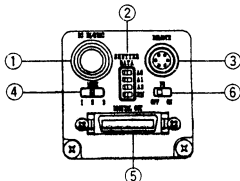
	Model type	Assembly type	Shield type
2m	C-201KSM	C-201KS	C-201KSS
5m	C-501KSM	C-501KS	C-501KSS
10m	C-102KSM	C-102KS	C-102KSS

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

*12-pin connector output pin differences

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

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.

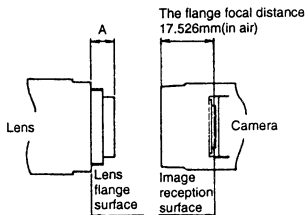
OPTICAL SYSTEM

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.

SIGNAL CONNECTION TO CONNECTOR

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

Pin No.	Internal SYNC mode	External SYNC mode			
		HV/VD	Frame-On-Demand		
			Field 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	GND	EXTHD(GND)	GND	GND	GND
6	—	EXTHD(SIGNAL)	—	—	—
7	—	EXTVD(SIGNAL)	TRIG-A(SIGNAL)	TRIG-A(SIGNAL)	TRIG-A(SIGNAL)
8	GND	GND	GND	TRIG-B(GND)	GND
9	—	—	—	TRIG-B(SIGNAL)	—
10	GND	GND	GND	GND	GND
11	+12V	+12V	+12V	+12V	+12V
12	GND	EXTVD(GND)	TRIG-A(GND)	TRIG-A(GND)	TRIG-A(GND)

DC IN/SYNC

HR10A-10P-12S(01)

Product : 23810AX



View from this side



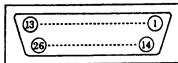
Camera side

(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.



DIGITAL OUT
DX30AM-26P
Part code : JMD0240



(3) Signal connection to REMOTE connector

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



REMOTE
HR10A-7P-6P(01)
Part code : JMH0092



Camera side

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

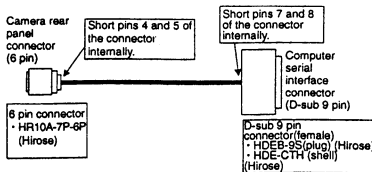
- **Notes:** At the camera Remote plug, connect pin 4 Manual/remote and pin 5 ground. At the computer serial interface connector (D-SUB), short pins 7 (RTS) and 8 (CTS). In the region CE Marking required, use the Shield type cable.

REMOTE CABLE WIRING

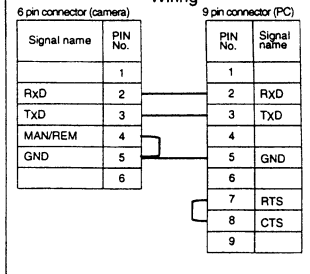
The cable indicated below is used for remotely controlling the camera.

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).

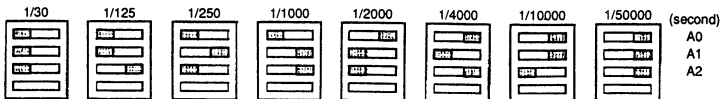


Wiring



- Note:** TxD: Transmit data from PC to camera.
RxD: Transmit data from camera to PC
In the region CE marking required, use the Shield type cable.

(1) Setting of shutter speed



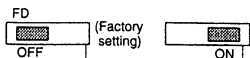
(Factory setting)

(2) REMOTE HOLD

		REMOTE HOLD	
		ON	OFF
REMOTE CABLE Connection	REMOTE	REMOTE	REMOTE
REMOTE CABLE Non Connection	REMOTE	SWITCH	SWITCH

ON Factory setting)
OFF

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

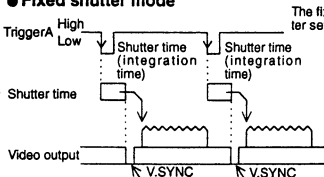


(4) SETTING OF MODE

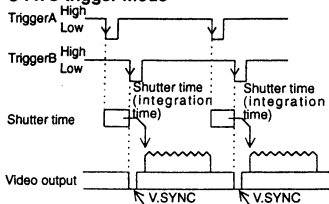
MODE	FD switch: OFF	FD switch: ON
1	1: Electronic shutter OFF	1: Fixed shutter
2	2: Electronic shutter ON	2: TWO trigger
3	3: _____	3: ONE trigger

FRAME-ON-DEMAND-FUNCTION

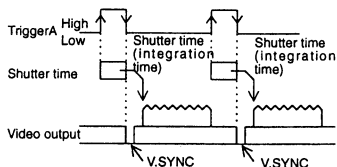
● Fixed shutter mode



● TWO trigger mode

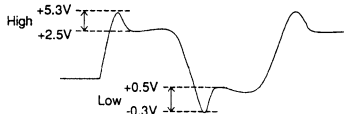


● ONE trigger mode



Condition of external signal input

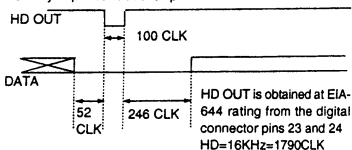
external signal input (Trig-A/Trig-B/Ext-HD/Ext-VD)



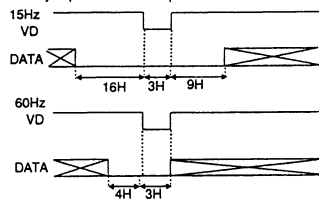
INPUT/OUTPUT SIGNAL LEVELS AND TIMING

(1) Digital output

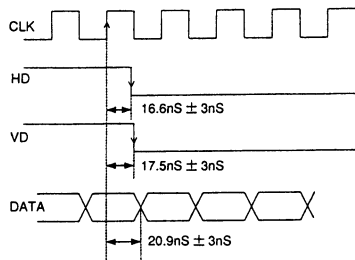
● H sync phase relationship



● V sync phase relationship

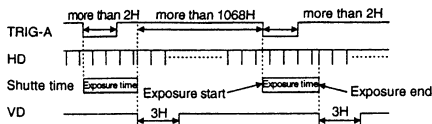


● CLK & DATA phase relationship



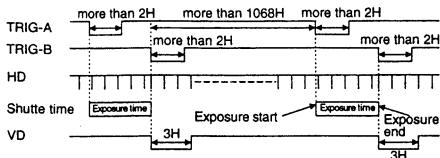
(2) TRIG-A input and HD & VD phase during Fixed shutter mode

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



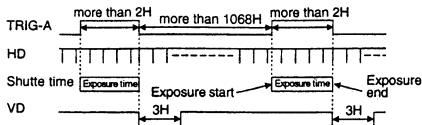
(3) TRIG-A & B input phase and HD & VD phase during Two trigger mode

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



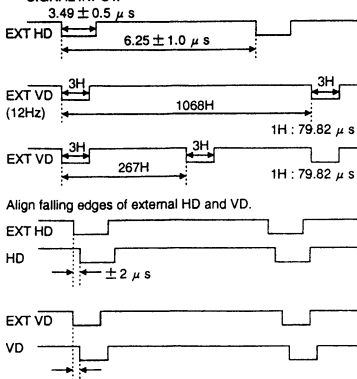
(4) One trigger mode

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



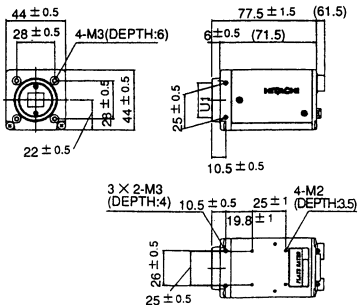
(5) External HD & VD Input levels and phase

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



VD output is delayed 2H compared to EXT VD.

EXTERNAL VIEW



Caution

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

SPECIFICATIONS

- | | | | |
|-----------------------------------|--|-------------------------------|--|
| (1) Pickup element | 2/3-inch interline CCD | Digital output | EIA-644 |
| Total pixels | 1432 (H) × 1050 (V) | | Note: Maximum digital out cablelength is 10 meters. |
| Effective pixels | 1392 (H) × 1040 (V) | | Data: Single channel 10 bits, 28.64MHz |
| Pixel pitch | 6.45 (H) × 6.45(V) μm (square lattice) | (12) External sync input | HD/VD negative Please refer to the CONDITION OF EXTERNAL SIGNAL INPUT |
| (2) Imaging area | 8.98 (H) × 6.71 (V) mm | | Input impedance: 1 k Ω |
| (3) Scanning system | Non-interlaced | | Frequency deviation: ± 1% |
| (4) Aspect ratio | 4 : 3 | (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. |
| (5) Frame rate | 15 frames/second (full pixel readout)
60 fps (4 × accelerated mode) | (14) Gamma compensation | γ = 1 |
| (6) Horizontal scanning frequency | 16 kHz | (15) Frame-on-demand | External switch setting on/off and modes (fixed shutter, two trigger, and one trigger). |
| (7) Vertical scanning frequency | 15 Hz | (16) Power supply voltage | 12 ± 1 VDC |
| (8) Synchronization | Internal/external (automatic switching) | (17) Current consumption | Approx. 320 mA |
| (9) Lens mount | C mount | | |
| (10) Flange focal distance | 17.526 mm | | |
| (11) Video output | Digital output or analog output for image checking | | |

- (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
- | | |
|-------------------|-----------------------------------|
| 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. × 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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