

Preliminary

## High-resolution progressive scan monochrome CCD camera

# KP-F200F/F200CL

2.01 million pixels, 24 frames per second, full pixel independent readout, frame on demand and partial scan in a small design camera.



The Hitachi KP-F200/F200CL is a high resolution black and white camera utilizing a 1/1.8-inch size CCD with progressive scan, full frame readout, full frame shutter. The KP-F200/F200CL outputs at 24 frames per second, in small and light weight design. High resolution is provided by the 2.01 million pixels in a square lattice configuration that is conducive to image processing applications. The host of versatile functions includes digital output, multi-step electronic shutter, HD/VD external sync, frame on demand and partial scan. The remote control permits setting from a personal computer.

### High speed readout

Full pixel independent readout : 24 frames per second.  
Partial scan : Read out up to over 190 frames per second max.

### High resolution:

1/1.8-inch CCD effective pixels 1628(H)x1236(V) and square lattice pixels

### Digital Video output signals: Camera-Link EIA-644 optionally

### Full frame shutter

Higher resolution in the vertical direction is ensured for moving objects.

### Multi-step electronic shutter:

8 step s electronic shutter from 1/24 second to 1/50000 second

### Frame on demand

An external trigger signal input can be used to capture an image at a desired timing for instant view or processing.

### RS-232C Control

Frame on demand, Partial Scan, etc by RS-232C control or rear panel switch.

### Main specifications

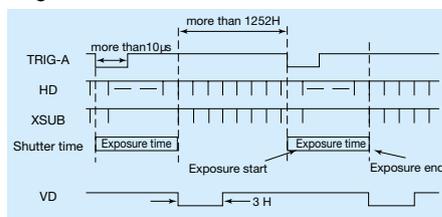
Imaging device	1/1.8-inch CCD with Progressive scan
Effective pixels	1628(H) x 1236(V)
Pixel pitch	4.4 $\mu$ m(H)x4.4 $\mu$ m (square lattice)
Imaging area	7.16mm(H)x5.94mm(V)
Scanning system	Progressive
Aspect ratio	4 : 3
Frame rate	24 frames per second (full pixel readout)
Scanning frequency	Horizontal : 30 kHz, Vertical : 24 Hz
Synchronization	Internal/external (HD/VD)
Lens mount	C mount
Flange focal distance	17.526mm
Video output signals	Digital out: Camera-Link (EIA-644 optionally)
External sync input	HD/VD LVDS level
Electronic shutter	1/50000, 1/10000, 1/2000, 1/1000, 1/250, 1/125, 1/60, 1/24 second
Gamma correction	Gamma=1
Frame on demand	External switch setting
Power supply	12 $\pm$ 1 VDC approx.450 mA
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
Vibration endurance	29.4 m/s <sup>2</sup> ( 10 to 200Hz, 30 minutes each on XYZ axes )
Shock endurance	294 m/s <sup>2</sup> ( vertical, horizontal, once each face )
Dimensions	58 (W) x 58 (H) x 48 (D) mm
Mass	Approx. 220 g

### Frame-on-demand Function

With the Frame-on-demand function, moving objects can be captured at an optional or fixed exposure time by supplying a trigger pulse at an optional timing.

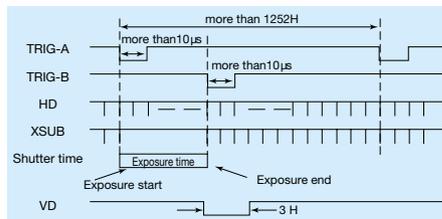
#### Fixed shutter mode

When one trigger pulse (TRIG A) is supplied, exposure starts at the rising edge of the inputs pulse, and ends at the falling edge of TRIG A pulse. The period between the two pulses is exposure time.



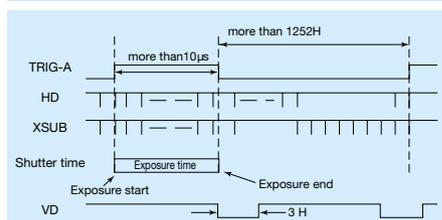
#### Two trigger mode

When two trigger pulses (TRIG A and TRIG B) are supplied, exposure starts at the rising edge of the TRIG A pulse, and ends at the falling edge of TRIG B pulse. The period between the two pulses is exposure time.



#### One trigger mode

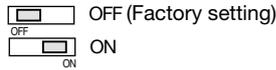
When one trigger pulse (TRIG A) is supplied, exposure starts at the rising edge of the inputs pulse, and ends at the falling edge of the inputs pulse. Then, the V-SYNC pulse is reset and picture are delivered immediately. The pulses width is the exposure time.



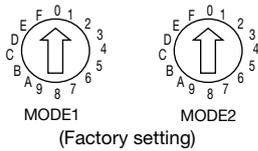
## Rear panel switches

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

### ● REMOTE ON/OFF switch



### ● MODE ON/OFF switch



### MODE1, MODE2 position select

SW POS.	MODE1	MODE2	MODE2			
			(1)	(2)	(3)	
0	Normal mode	(1)	0	0 dB	1/24	16H
1	One trigger mode		1	1 dB	1/60	32H
2	Two trigger mode		2	2 dB	1/125	64H
3	Quad speed mode		3	3 dB	1/250	128H
4	Quad speed mode+One trigger mode		4	4 dB	1/1000	256H
5	Smear reduction mode + one trigger mode	(2)	5	5 dB	1/2000	512H
6	Smear reduction mode + one trigger mode		6	6 dB	1/10000	512H
7	Smear reduction mode Quad speed mode+ One trigger mode		7	7 dB	1/50000	512H
8	Normal shutter mode		8	8 dB	1/50000	512H
9	Fixed shutter mode		9	9 dB	1/50000	512H
A	Smear reduction mode fixed shutter mode	(3)	A	10 dB	1/50000	512H
B	Partial scan (Normal mode) (READ POS. : CENTER)		B	11 dB	1/50000	512H
C	Partial scan (Normal mode) (READ POS. : UPPER)		C	12 dB	1/50000	512H
D	Partial scan (One trigger mode) (READ POS. : CENTER)		D	13 dB	1/50000	512H
E	Partial scan (One trigger mode) (READ POS. : UPPER)		E	14 dB	1/50000	512H
F	Twice speed mode	(1)	F	15 dB	1/50000	512H

- (1), (2), (3) of MODE2 can be selected  
 (1) : SW POS. of MODE1 : 0, 2, 3, 9 to F (Gain)  
 (2) : SW POS. of MODE1 : 1, 4 (Shutter speed)  
 (3) : SW POS. of MODE1 : 5 to 8 (Partial scan)

## Pin connections

### ● Connections to DC IN and SYNC (12 pin)

Pin No.	Int.sync	Ext. HD/VD	Ext. sync		
			Frame on demand		
			Fixed shutter	Two trigger	One trigger
1	GND	GND	GND	GND	GND
2	+12 V	+12 V	+12 V	+12 V	+12 V
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	-	-	WEN	TRIG-B (SIGNAL)	WEN
10	GND	GND	GND	GND	GND
11	+12 V	+12 V	+12 V	+12 V	+12 V
12	GND	EXTVD (GND)	TRIG-A (GND)	TRIG-A (GND)	TRIG-A (GND)

Not connect EXT input signals 3 to 9 and 12 pin in KP-F200CL

### ● Remote (RS-232C control) cable pin connections (KP-F200 only)

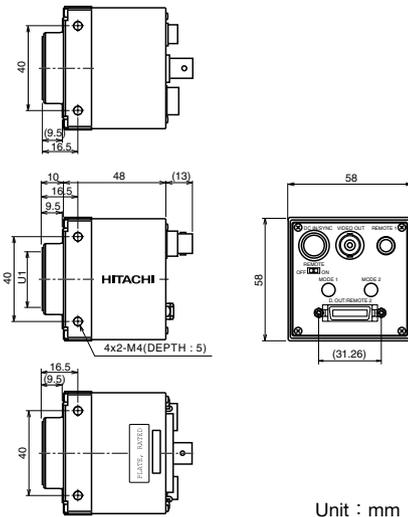
PIN No.	Signal name
1	-
2	RD
3	TD
4	Manual/remote
5	Ground
6	-

### ● EIA-644(50pin) digital out connector DX10G1M-50S (KP-F200 only)

PIN No.	Signal name						
1	DATA DB-D0(+)	2	DATA DB-D0(-)	26	DATA DA-D0(+)	27	DATA DA-D0(-)
3	DATA DB-D1(+)	4	DATA DB-D1(-)	28	DATA DA-D1(+)	29	DATA DA-D1(-)
5	DATA DB-D2(+)	6	DATA DB-D2(-)	30	DATA DA-D2(+)	31	DATA DA-D2(-)
7	DATA DB-D3(+)	8	DATA DB-D3(-)	32	DATA DA-D3(+)	33	DATA DA-D3(-)
9	DATA DB-D4(+)	10	DATA DB-D4(-)	34	DATA DA-D4(+)	35	DATA DA-D4(-)
11	DATA DB-D5(+)	12	DATA DB-D5(-)	36	DATA DA-D5(+)	37	DATA DA-D5(-)
13	DATA DB-D6(+)	14	DATA DB-D6(-)	38	DATA DA-D6(+)	39	DATA DA-D6(-)
15	DATA DB-D7(+)	16	DATA DB-D7(-)	40	DATA DA-D7(+)	41	DATA DA-D7(-)
17	DATA DB-D8(+)	18	DATA DB-D8(-)	42	DATA DA-D8(+)	43	DATA DA-D8(-)
19	DATA DB-D9(+)	20	DATA DB-D9(-)	44	DATA DA-D9(+)	45	DATA DA-D9(-)
21	TX2	22	RX2	46	CLK OUT(+)	47	CLK OUT(-)
23	GND	24	GND	48	VD OUT(+)	49	VD OUT(-)
25	HD OUT(+)			50	HD OUT(-)	Shield	GND

Cable side Connecting plug DXM30AM-50P(HIROSE)

## Dimensions



Unit : mm

## Standard Composition

- Camera
- Operating instructions

## Optional accessories

- 12 pin plug.....HR10A-10P-12S(01)
- Junction box.....JU-M1A /JU-F1
- Dummy glass (AR coated).....ARC1214
- Camera cable(Molded type)
  - 2m C-201KSM
  - 5m C-501KSM
  - 10m C-102KSM
- (5) Tripod adaptor.....TA-F120

## ● Camera-Link digital out connector : 10226-5202JL (3M)

Pin No.	Signal name	Pin No.	Signal name
1	GND	14	GND
2	TXOUT 0 (-)	15	TXOUT 0 (+)
3	TXOUT 1 (-)	16	TXOUT 1 (+)
4	TXOUT 2 (-)	17	TXOUT 2 (+)
5	TXCLKOUT (-)	18	TXCLKOUT (+)
6	TXOUT 3 (-)	19	TXOUT 3 (+)
7	RX (+)	20	RX (-)
8	TX (-)	21	TX (+)
9	TRIG-AVD (-) [ CC1 (-) ]	22	TRIG-AVD (+) [ CC1 (+) ]
10	TRIG-B (+) [ CC2 (+) ]	23	TRIG-B (-) [ CC2 (-) ]
11	EXT-HD (-) [ CC3 (-) ]	24	EXT-HD (+) [ CC3 (+) ]
12	NC [ CC4 (+) ]	25	NC [ CC4 (-) ]
13	GND	26	GND

The digital out cable should be comprised of a twisted pair of wires having 100 ohm 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.

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