

Progressive scan Color CCD camera

KP-FD140PCL/SCL

Specifications(Preliminary) Ver1.0

1. General

The KP-FD140CL/PCL is single CCD type RGB color camera which utilized the progressive scan CCD image sensor with square pixel for SXGA format of 1 / 2-inch which adopted the RGB primary color mosaic filter. Progressive scan with full pixel independent readout and full frame shutter provide images of unparalleled quality at 30 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, and frame on demand etc. The square lattice pixel format also provides excellent suitability for image processing applications.

2. Outstanding features

(1) High resolution and high color fidelity

The 1/2-inch 1,450,000 pixels square lattice progressive scan CCD and the RGB primary color mosaic filter achieve a high resolution and high color fidelity of 1360(H) x 1024(V)(SXGA)

(2) Frame shutter

The frame shutter function improves vertical resolution of moving objects.

(3) Multi-step electronic shutter

The shutter speed can be selected in 8 steps from 1/30th second to 1/100,000th second. (Variable: 1/100,000th second(min), 10 second(Max))

(4) 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.

(5) White balance

- ATW : Auto-tracking white balance mode
- MANUAL : Manual white balance (R, B gain control).
- One-Push : Auto adjust function.

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APPD	M. Suzuki	Oct 25 '06					

(6) 6 vector independent masking

Saturation and hue of primary colors R, G, B and complementary colors Cy, Mg, Ye can be independently varied. It is effective at a application (Image capture, microscope, etc) needed highly accurate color fidelity.

(7) Various functions can be set by a remote control.

(8) Digital output

Camera Link

(9) Power supply of KP-FD140PCL is input via Camera Link cable.

3. Specifications

(1) Imaging device	1/2-inch progressive scan interline CCD (with on-chip microlenses)
Total pixels	1434(H) x 1050(V)
Effective pixels	1392(H) x 1040(V)
Unit cell size	4.65(H) x 4.65(V) um (square lattice)
Color filter	RGB primary color mosaic filter
(2) Scanning system	Progressive
(3) Sync system	Internal
(4) Video output	
Interface	Camera Link standard(SDR connector)
Protocol	Base configuration(1ch:SDR connector x 1pc.) Medium /Full configuration (2ch:SDR connector x 2pcs)
Output format	(a) 24bits (R:8bits G:8bits B:8bits) (Base configuration/ Medium configuration) In 24bits mode, selectable 1ch/2ch by remote control. (b) 30bits (R:10bits G:10bits B:10bits) (Medium configuration) (c) 36bits (R:12bits G:12bits B:12bits) (Full configuration)
Output image size	1392(H) x 1040(V)
Frame rate	30frames/second (full pixel readout)
(5) Horizontal drive frequency	64 MHz
(6) Horizontal scanning frequency	33.519 kHz
(7) Vertical scanning frequency	30 Hz
(8) Camera remote	Camera Link control

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(9) Sensitivity	2000 lx, F8, 3200 K		
(10) Minimum lamination	5.0 lx, F1.4, MAX GAIN		
(11) Gain	Auto/Manual (0 to +18.5dB)(Approx. 0.04dB step)	A	
(12) VD reset	VD LVDS level, 30 Hz or less		
(13) Electronic shutter speed	1/30, 1/60, 1/125, 1/250, 1/1000 1/2000, 1/10000, 1/50000 second. Factory setting is off (1/60 second) or changeable by variable shutter (Minimum 1/100000 second)		
(14) Frame on demand	Remote setting Fixed shutter, one trigger and reset control mode Factory setting is all off.	B	
(15) Partial scan	Selectable start position and width of picture grabbing in 2H step.		
(16) Auto Exposure (ALC: Auto level control)	Adjustable for video level		
(17) White balance	ATW / MANUAL / One-push		
(18) Gamma	OFF / LUT		
(19) Color masking	OFF / ON (6 vector independent masking)		
(20) Color saturation	Adjustable	C	
(21) Color level	Adjustable (Paint-black)		
(22) Sharpness	Adjustable		
(23) Brightness	Adjustable		
(24) Lens mount	C mount (with Flange-back adjustment)		
(25) Power supply voltage	12 ± 1 VDC		
(26) Current consumption	Approx. 340 mA (Approx. 4.1W)		
(27) 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	D	
Note: If operated continuously, be sure to use at less than +40°C(104 F) for long term stable performance.			
(28) Vibration endurance	98 m/s ² (Acceleration: constant) (10 to 200Hz,sweep:10 min,XYZ,30 min)		
(29) Shock endurance	686 m/s ² (Drop test, once each top, bottom, left and right)	E	
(30) External dimensions	44 (W) x 44 (H) x 43 (D) mm (not including mount protrusions)		
(31) Mass	Approx. 130 g (not including lens)		

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(32) Remote control

(a) Signal system

Control system	Start-stop synchronization system
Transmission rate	9600 bps
Data length	8 bits
Start bit	1bit
Stop bit	1bit
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, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second
2. Variable shutter	Minimum 1/100000 second, Max 10 second
3. Mode	Normal mode, Normal shutter mode Fixed shutter, One trigger, reset control mode
4. Gain	0 to 18.5 dB(Approx. 0.04 dB step)
5. VD/FVAL	Factory setting: VD
6. HD/LVAL	Factory setting: HD
7. 8bit/10bit	Factory setting: 10bit
8. HD reset/NON reset	Factory setting: HD reset
9. Partial scan mode	
10. VD reset mode	
11. Trigger pulse polarity	Factory setting: POS
12. 1ch/2ch(24bit mode)	Factory setting: 1ch

4. Composition

- (1) Camera
- (2) Operating instructions

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5. Optional accessories

- (1) 12 pin plug HR10A-10P-12S(01) or equivalent
 (2) Junction box JU-M1A, JU-F30
 (3) Dummy glass (AR coated) ARC1214
 (4) Camera cable

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

In the CE Marking region ,use the shield type.

- (5) Tripod adaptor TA-FD140

(1) Signal connection to DC IN(KP-FD140SCL)

PIN No.	Internal SYNC mode	PIN No.	Internal SYNC mode
1	GND	7	Trig-A
2	+12V	8	GND(Pin11)
3	GND(Pin4)	9	————
4	FLASH OUT	10	————
5	————	11	Trig-B
6	————	12	GND(Pin7)

- Connector (camera side) SAMWOO SNH-10-12(RPCB) or equivalent
 Plug (matching cable plug) Hirose HR10A-10P-12S(01) or equivalent

Please do not unplug and insert cable(camera cable) with a power supplied to a camera.

(2) Signal connection to DIGITAL OUT connector

(a) Interrelation between Number of DATA bits and Number of used connector

	Number of DATA bits	connector 1	connector 2
1	24bit (R:8bits G:8bits B:8bits) (1ch)	O	-
2	24bit (R:8bits G:8bits B:8bits) (2ch)	O	O
3	30bit (R:10bits G:10bits B:10bits)	O	O
4	36bit (R:12bits G:12bits B:12bits)	O	O

O: Use
 -: Not use

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(b) Signal connection to DIGITAL OUT connector

Connector1(24bits(1ch) / 30bits / 36bits)

Pin No.	Signal	Pin No.	Signal
1	+12V (KP-FD140PCL)	14	GND
	GND (KP-FD140SCL)		
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 (+) [SERTC (+)]	20	RX (-) [SERTC (-)]
8	TX (-) [SERTFG (-)]	21	TX (+) [SERTFG (+)]
9	TRIG-AVD (-) [CC1 (-)]	22	TRIG-AVD (+) [CC1 (+)]
10	TRIG-B (+) [CC2 (+)]	23	TRIG-B (-) [CC2 (-)]
11	NC [CC3 (-)]	24	NC [CC3 (+)]
12	NC [CC4 (+)]	25	NC [CC4 (-)]
13	GND	26	+12V (KP-FD140PCL)
			GND (KP-FD140SCL)

Connector2(24bits(2ch) / 30bits / 36bits)

Pin No.	Signal	Pin No.	Signal
1	+12V (KP-FD140PCL)	14	GND
	GND (KP-FD140SCL)		
2	TYOUT 0 (-)	15	TYOUT 0 (+)
3	TYOUT 1 (-)	16	TYOUT 1 (+)
4	TYOUT 2 (-)	17	TYOUT 2 (+)
5	TYCLKOUT (-)	18	TYCLKOUT (+)
6	TYOUT 3 (-)	19	TYOUT 3 (+)
7	100Ω	20	terminated
8	TZOUT 0 (-)	21	TZOUT 0 (+)
9	TZOUT 1 (-)	22	TZOUT 1 (+)
10	TZOUT 2 (-)	23	TZOUT 2 (+)
11	TZCLKOUT (-)	24	TZCLKOUT (+)
12	TZOUT 3 (-)	25	TZOUT 3 (+)
13	GND	26	+12V (KP-FD140PCL)
			GND (KP-FD140SCL)

Connector (camera side)

Sumitomo 3M 1226-1100-00PL or equivalent

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- The digital out cable should be comprised of a twisted pair of wires having 100Ω 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.
 - Tx: Transmit data from camera to PC
 - Rx: Transmit data from PC to camera
- (Note)
Please do not unplug and insert cable(digital out cable) with a power supplied to a camera.

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Notice:

These specifications are subject to change without prior notice due to product improvement.

Confirm the most recent specifications at time of order.

Hitachi Kokusai certifies this product complies with the standard warranty conditions of Hitachi Kokusai, and that quality control is implemented to the extent required to comply with these conditions.

RoHS Compliant

This product complies with the requirement of the RoHS(Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment) Directive 2002/95/EC

Warranty and service:

- (1) The guarantee period is one year after the data purchase.
However, the defects due to erroneous use or intentional act are excluded.
- (2) As the defect after expiration of the guarantee period, where product repair is possible, repair will be performed at charge. .
- (3) The present Warranty pertains only to the camera unit. Secondary malfunctions attributable to camera failure as well as expenses incurred by disassembly and reassembly of the related system, are beyond the scope of this Warranty.
- (4) Compensation for loss of business, loss or damage to software, database and other contingent losses are beyond the scope of this Warranty.
- (5) Hitachi Kokusai Electric Inc. is not liable for the losses caused when the equipment is used in a system, use for business trades, production process, medical fields, crime prevention applications, etc.
- (6) When the stable operation is required for a long time, it is recommended to perform periodical maintenance and inspection every year or every two years.
- (7) In the case of camera trouble by miss wiring of cable, it will be considered as out of warranty.

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Modification history

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