

Camera link ready 0.8-million / 0.33- million pixel Progressive scan camera

PROGRESSIVE SCAN CAMERA

FC320CL (30frame/sec)
FC820CL (15frame/sec)



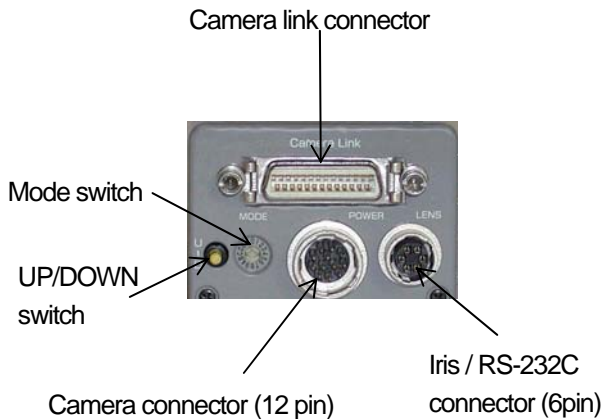
(Lens optional.)

Usage

- Inputting apparatus for image processing device provided high resolution electronic shutter
- High density bar code information reader
- Driving car number reader
- Defect detector for LCD and plasma display
- Microscope and telescope usage
- Miscellaneous overall devices required image processing connecting to computer

Description for panel at backside of camera

Panel used for changing of electronic shutter mode and speed together with connection for camera link cable and camera cable. (Right figure)



【Description of camera back panel】

Panel used for changing of electronic shutter mode and speed together with connection for camera link cable and camera cable. (Right figure)

Outline

- This camera is complied with Camera Link that is the Standard of Digital Camera Interface for new industrial use.
- Connectable any of globally famous frame grabber maker's product that is complied with Camera Link Standard.
- Video output is outputted in progressive scanning (non-interface scanning).
- Low cost is realized by adopting digital output and dedicated self-synchronization.
- Customer's developed software properties can be utilized because new series have compatibility with conventional FC820 / FC320.
- Such various shutter operations as continuous shutter mode and random shutter mode, etc. are available similar with conventional type.

Features

- Vertical resolution is not lowered under electronic shutter operation because full pixels independent read is implemented by using progressive scanning.
- "Base Configuration" of Camera Link is adopted and black-and-white 10bit gradation of digital video signal is outputted.
- Full pixels read scanning under 15 ~ 30 frame/sec. (Differs depend on type.) without mechanical shutter and random shutter is also possible because electronic shutter function is equipped.
- Full frame continuous electronics shutter and random shutter exposure can be variable in 8 steps exposure time from 1/10000 sec. (maximum speed) at fixed length and pulse width and long time exposure setting is also possible.
- In long time exposure mode, exposure time can be set variable from two-frame time in frame unit. (Differs depend on type.)
- In random shutter mode, release timing (strobe trigger signal) of electronic shutter is outputted from 12pin camera connector.
- Double-speed reading using vertical two pixels mixed read is possible at continuous shutter. (Excluding FC320CL)
- Three memories composed of various operation-setting parameters can be saved using backup memory (EEPROM).
- More detailed set up is possible through communication using personal computer because serial communication interface (SerTC and SerTFG) of Camera Link Connector is supported as standard. (*1)
- Low electric energy consuming product, which is about 60% comparing with conventional one.
- High sensitivity and low smear.

Item	Camera model	FC320CL	FC820CL
camera element	Scanning method	1/3 progressive scanning inter line transfer CCD	1/2 progressive scanning inter line transfer CCD
	Number of total pixels	692 (H) × 504 (V) 350 thousand pixels	1077 (H) × 788 (V) 850 thousand pixels
	Number of valid pixels	659 (H) × 494 (V) 330 thousand pixels	1034 (H) × 779 (V) 800 thousand pixels
	Chip size	5.84(H) × 4.94(V) mm	7.6(H) × 6.2(V) mm
	Unit cell size	7.4 (H) × 7.4 (H) μm	6.25 (H) × 6.25(H) μm
	Optical black	Horizontal (H) direction front 2 pixels rear 31 pixels Vertical (V) direction front 8 pixels rear 2 pixels	Horizontal (H) direction front 3 pixels rear 40 pixels Vertical (V) direction front 7 pixels rear 2 pixels
	Number of dummy bit	Horizontal (H) direction 16 vertical (V) 5	Horizontal (H) direction 29 vertical (V) 1
Reading out scanning	Horizontal scanning frequency $f_H = 15.7\text{KHz}$ Vertical scanning frequency $f_V = 30\text{Hz}$ Pixel clock frequency $F_{CLK} = 12.27\text{ MHz}$	Horizontal scanning frequency $f_H = 12.0\text{KHz}$ Vertical scanning frequency $f_V = 15\text{Hz}$ Pixel clock frequency $F_{CLK} = 14.318\text{ MHz}$	
External synchronization	No function (internal synchronizing operation)		
Sensitivity	100L x F11 (1/30 sec shutter)	100L x F11 (1/15 sec shutter)	
Minimum subject luminous intensity	1 Lx F1.4 (Infrared rays cut filter is not provided.)		
SN	More than 50dB		
Video output signal	Non-interlace method: 30fps	Non-interlace method: 15fps	
	Digital output : 10 bit, Complied with Camera Link Standard Base Configuration		
Gamma	$\gamma = 1$ fixed (0.45 is optionally provided)		
Electronic shutter	1/10000 ~ 1/30 sec. And long time shutter	1/10000 ~ 1/15 sec. And long time shutter	
	Continuous shutter, random shutter, and long time exposing mode change are possible.		
Communication control	URAT embedded, start stop synchronization method 9600bps through camera link (RS232C level input-output to camera connector is optionally possible.)		
Lens mount	C mount: Fixed flange back method (Variable length flange back method is optionally available.)		
Power source	DC 12V ±10% 250mA maximum		
Operation ambient temp.	0°C to 40°C		
Storing temperature range	-30°C to 60°C		
Anti-shock	70G		
Anti-vibration	7G (11 ~ 200Hz)		
External dimension	46 (W) × 49 (H) × 120 (L) mm (excluding connector)		
Weight	About 300g		

(Note) Specifications are subject to change for improvement without notice.

[Camera Link]

Camera Link (*2) is unified standard of Data Interface Standard for new digital camera developed for industrial camera adopting channel link (*3) device utilized advanced signal transmission technology of LVDS (Low Voltage Differential Signaling) system and provided with standardized shape of connector and cable, as well as pin arrangement, broad band width, and superior expandability.

Camera Link Standard that is planned by committee that is consisted of video camera makers and frame grabber makers who have been experienced interface for industrial image processing for a long time is developed for image processing interface by specializing their technologies into it. Therefore the Standard is matched the best to connect industrial use image processing devices.

Already many of frame grabber makers (*4) release their products complied with this standard and start marketing.

*1 ... Function of Serial Communication Interface is required hardware and software support at frame grabber side.

*2 ... Camera Link is unified standard planned by Camera Link Standardization Committee in U.S.A. and also registered trademark of Pulnix America managing company of the committee.

*3 ... Channel Link is registered trademark of National Semiconductor in U.S.A.

*4 ... Such companies as Graph-in, BitFlow, Epix, Euresys, Matrox, MuTech, National Instruments, etc.

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