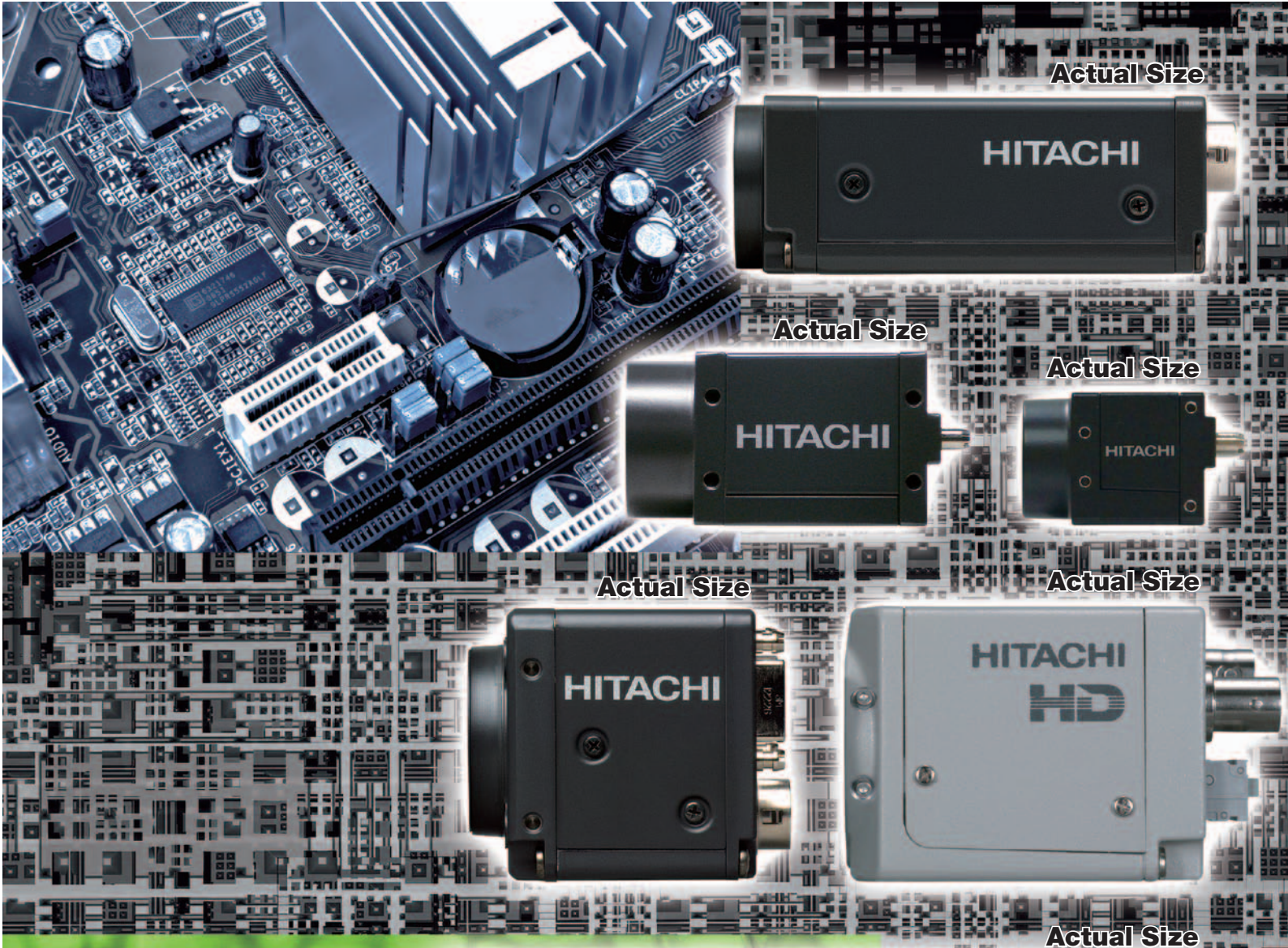


General Catalog

Cameras for Industrial Applications



Camera Overview

3CCD Cameras

GigE Vision (Gigabit Ethernet)						
HV-F202GV	1/1.8" 3CCD	UXGA (1600 x 1200)	28 fps	55 x 55 x 89 mm		Page 7
HV-F22GV	1/2" 3CCD	SXGA (1360 x 1024)	15 fps	65 x 65 x 141 mm		Page 7
Camera Link						
HV-F22CL	1/2" 3CCD	SXGA (1360 x 1024)	15 fps	65 x 65 x 130 mm		Page 13
HV-F22CL-S1	1/2" 3CCD	SXGA (1360 x 1024)	15 fps	65 x 65 x 130 mm		Page 13
HV-F31CL	1/3" 3CCD	XGA (1024 x 768)	30 fps	65 x 65 x 130 mm		Page 13
HV-F31CL-S1	1/3" 3CCD	XGA (1024 x 768)	30 fps	65 x 65 x 130 mm		Page 13
Mini Camera Link						
HV-F202SCL	1/1.8" 3CCD	UXGA (1600 x 1200)	30 fps	55 x 55 x 89 mm		Page 7
IEEE1394.a						
HV-F22F	1/2" 3CCD	SXGA (1360 x 1024)	7.5 fps	65 x 65 x 130 mm		Page 25
HV-F31F	1/3" 3CCD	XGA (1024 x 768)	15 fps	65 x 65 x 130 mm		Page 25
HD						
DK-H100	2/3" 3CCD	1080i (1920 x 1080)		99 x 105 x 155 mm		Page 3
DK-Z50	2/3" 3CCD	1080i (1920 x 1080)		99 x 105 x 155 mm		Page 3
HV-HD33	1/3" 3MOS	1080i/720p (1280 x 720)		65 x 65 x 125 mm		Page 4
HV-HD201/201M	1/2" 3CCD	1080i/720p (1440 x 1080)		Head: 50 x 50 x 55 mm		Page 5
Analog						
HV-D20	1/2" 3CCD	PAL (752 x 582)		65 x 65 x 130 mm		Page 26
HV-D30	1/3" 3CCD	NTSC (768 x 494), PAL (752 x 582)		65 x 65 x 80 mm		Page 26

1CCD Color Cameras

GigE Vision (Gigabit Ethernet)						
KP-FD500GV	2/3" 1CCD	5M pixel (2456 x 2058)	9 fps	44 x 29 x 72 mm		Page 9
KP-FD202GV	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44 x 29 x 72 mm		Page 9
KP-FD140GV	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44 x 29 x 72 mm		Page 9
KP-FD83GV	1/3" 1CCD	XGA (1034 x 779)	36 fps	44 x 29 x 72 mm		Page 9
KP-FD33GV	1/3" 1CCD	VGA (659 x 494)	90 fps	44 x 29 x 72 mm		Page 9
Camera Link						
KP-FD30CL	1/1.8" 1CCD	VGA (659 x 494)	60 fps	58 x 58 x 48 mm		Page 13
Mini Camera Link						
KP-FD500SCL/PCL	2/3" 1CCD	5M pixel (2456 x 2058)	12 fps	44 x 44 x 41 mm		Page 14
KP-FD202SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44 x 44 x 41 mm		Page 14
KP-FD140SCL/PCL	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44 x 44 x 41 mm		Page 14
HD						
KP-HD20A	1/3" MOS	1080i/720p (1944 x 1092)		44 x 44 x 59 mm		Page 6
Analog Interlace						
KP-D20B	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		44 x 44 x 49 mm		Page 27
KP-DE500	1/2" 1CCD	NTSC (680 x 500)		78 x 63 x 170 mm		Page 27
KP-D5000/D5001	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64 x 63 x 135 mm		Page 28
KP-D5010	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64 x 63 x 64 mm		Page 28
KP-D20A	1/3" 1CCD	NTSC (768 x 494), PAL (752 x 582)		44 x 44 x 49 mm		Page 27
Analog Progressive						
KP-FD30	1/2" 1CCD	VGA (659 x 494)	60 fps	58 x 58 x 48 mm		Page 30
KP-FD30M	1/2" 1CCD	VGA (659 x 494)	60 fps	58 x 58 x 48 mm		Page 30

1CCD Color (RAW) Cameras

Mini Camera Link						
KP-FR500WCL	2/3" 1CCD	5M pixel (2456 x 2058)	16 fps	44 x 44 x 41 mm		Page 17
KP-FMR400WCL	1" 1CMOS	4M pixel (2048 x 2048)	150 fps	44 x 44 x 41 mm		Page 15
KP-FR230SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	29 x 29 x 38 mm		Page 17
KP-FR200SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29 x 29 x 29 mm		Page 17
KP-FMR200WCL	2/3" 1CMOS	2M pixel (2048 x 1088)	280 fps	44 x 44 x 41 mm		Page 15
KP-FR80SCL/PCL	1/3" 1CCD	XGA (1034 x 779)	36 fps	29 x 29 x 29 mm		Page 17
KP-FR31SCL/PCL	1/3" 1CCD	VGA (659 x 494)	120 fps	29 x 29 x 38 mm		Page 17
KP-FR30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29 x 29 x 29 mm		Page 17
KP-FBR30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	Head: 12 x 12.5 x 47.5 mm		Page 17

Camera Overview

1CCD Black & White Cameras

GigE Vision (Gigabit Ethernet)						
KP-F500GV	2/3" 1CCD	5M pixel (2456 x 2058)	16 fps	44 x 29 x 72 mm		Page 11
KP-F202GV	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44 x 29 x 72 mm		Page 11
KP-F145GV	2/3" 1CCD NIR	SXGA (1392 x 1040)	30 fps	44 x 29 x 72 mm		Page 11
KP-F140GV	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44 x 29 x 72 mm		Page 11
KP-F83GV	1/3" 1CCD	XGA (1034 x 779)	36 fps	44 x 29 x 72 mm		Page 11
KP-F33GV	1/3" 1CCD	VGA (659 x 494)	90 fps	44 x 29 x 72 mm		Page 11
Camera Link						
KP-F120CL	2/3" 1CCD	SXGA (1392 x 1040)	30 fps	58 x 58 x 48 mm		Page 22
Mini Camera Link						
KP-F500WCL	2/3" 1CCD	5M pixel (2456 x 2058)	16 fps	44 x 44 x 41 mm		Page 19
KP-FM400WCL	1" 1CMOS	4M pixel (2048 x 2048)	150 fps	44 x 44 x 41 mm		Page 15
KP-F230SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	29 x 29 x 38 mm		Page 19
KP-F200SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29 x 29 x 29 mm		Page 19
KP-FM200WCL	2/3" 1CMOS	2M pixel (2048 x 1088)	280 fps	44 x 44 x 41 mm		Page 15
KP-F145WCL	2/3" 1CCD NIR	SXGA (1392 x 1040)	30 fps	44 x 44 x 41 mm		Page 19
KP-F80SCL/PCL	1/3" 1CCD	XGA (1034 x 779)	36 fps	29 x 29 x 29 mm		Page 19
KP-F31SCL/PCL	1/3" 1CCD	VGA (659 x 494)	120 fps	29 x 29 x 38 mm		Page 19
KP-F30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29 x 29 x 29 mm		Page 19
KP-FB30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29 x 29 x 29 mm		Page 19
PoCL-Lite						
KP-F200Lite	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29 x 29 x 29 mm		Page 23
KP-F80Lite	1/3" 1CCD	XGA (1034 x 779)	36 fps	29 x 29 x 29 mm		Page 23
KP-FM30Lite	1/3" 1CCD	VGA (659 x 494)	60 fps	29 x 29 x 29 mm		Page 23
KP-F30Lite	1/3" 1CMOS	VGA (752 x 480)	90 fps	2.15 x 21.5 x 21.5 mm		Page 23
KP-FBM30Lite	1/3" 1CMOS	VGA (752 x 480)	90 fps	2.15 x 21.5 x 21.5 mm		Page 23
Analog Interlace						
KP-M1A	2/3" 1CCD	EIA (768 x 494), CCIR (752 x 582)		44 x 29 x 72 mm		Page 29
KP-M2A	1/2" 1CCD	EIA (768 x 494), CCIR (752 x 582)		44 x 29 x 72 mm		Page 29
KP-M2R-S3	1/2" 1CCD NIR	EIA (768 x 494), CCIR (752 x 582)		44 x 29 x 72 mm		Page 29
KP-M20	1/2" 1CCD	EIA (768 x 494), CCIR (752 x 582)		29 x 29 x 38.5 mm		Page 29
KP-E500	1/2" 1CCD	EIA (658 x 489)		78 x 63 x 170 mm		Page 27
KP-M3A	1/3" 1CCD	EIA (768 x 494), CCIR (752 x 582)		44 x 29 x 72 mm		Page 29
KP-M30	1/3" 1CCD	EIA (768 x 494), CCIR (752 x 582)		29 x 29 x 38.5 mm		Page 29
Analog Progressive						
KP-F80	1/3" 1CCD	XGA (1034 x 779)	30 fps	29 x 29 x 38.5 mm		Page 31
KP-F33	1/3" 1CCD	VGA (659 x 494)	30 fps	29 x 29 x 38.5 mm		Page 31
KP-F30	1/3" 1CCD	VGA (659 x 494)	60 fps	29 x 29 x 38.5 mm		Page 31

Accessory list	Page 32
Accessories (Junction Box, Tripod Adaptor, Camera Cable, C/CS Adaptor, Dummy Glass)	Page 33
List for Frame Grabber Board	Page 34
List for Frame Grabber (Box type)	Page 36
List for Optional Lens	Page 37

FULL HD
2/3" 3CCD
1080i, 480i, 576i

DK-H100
DK-Z50



Main Features

High S/N with HD-SDI

Outstanding Signal-to-noise ratio >60dB (>58dB for DK-Z50) measured on the HD-SDI (1080i) output.

14-bit ADC with the latest generation Hitachi DSP

High dynamic range and color fidelity are achieved by employing 14-bit analog-to-digital converters on the RGB CCDs' output. Hitachi is a leading developer for high performance CPU & DSP in broadcasting fields.

High resolution (DK-H100)

The latest generation 2/3-inch 2.3 million pixels CCD with micro lenses and multi speed signal processing circuits provide a horizontal resolution performance of 1100 TV lines (luminance channel).

High resolution (DK-Z50)

The latest generation 2/3-inch CCD with micro lenses and spatial-offset processing technologies provide a horizontal resolution performance of 800 TV lines (luminance channel).

Small & light weight head

Versatile CCD shutter

- Five preset shutter speeds
- Lock scan the camera video to image from asynchronous computer monitors, video walls or projectors without flicker
- Automatic electric shutter (AES) maintains the video level with a fixed lens f-stop

DSP provide advanced image handling and adjustment functions

- Knee saturation and auto-knee
- 12-vector and linear matrix masking
- Skin tone masking
- Automatic skin tone detail circuit
- Variable detail boost frequency
- Ultra gamma
- Gray scale automatic setup
- Automatic shading correction

Extensive user-friendly features

- Eight scene files are provided to store and recall functions such as gain, detail, masking, gamma and other settings
- White balance memories are provided for each scene files for a total on nine memories by the remote control panel
- Menu access is provided for iris level (fine adjustment) and iris peak/average selection
- Computer controlled real-time auto-white balance
- ECC (Electric Color Compensating) Filter

Main Specifications

		DK-H100	DK-Z50
CCD		2/3" IT-3CCD	
Total pixels		2010(H) x 1120(V) 2.3 million pixels	1.0 million pixels
Effective pixels		1920(H) x 1080(V)	-
Aspect ratio		16:9 (HD/SD), 4:3 (SD) switchable	
TV signal format		1080/59.94i, 1080/50i, 480/59.94i, 576/50i	
Horizontal resolution		1100 TV lines	800 TV lines
Standard sensitivity		2000 lx / F10 (1080/59.94i), 2000 lx / F11 (1080/50i), 3200K, 89.9 reflectance	
Minimum illumination		0.002 lx (F1.4, +72dB) +72dB at +36dB Gain and CCD charge accumulation	
S/N		Typical 60dB (HD-SDI output decode Y channel Band: 27.5MHz)	Typical 58dB (HD-SDI output decode Y channel Band: 27.5MHz)
Lens mount		Bayonet mount	
Optical filter		Clear, 1/4ND, 1/16ND, 1/64ND	
ECC filter		3200K, 4300K, 5600K, 6300K, 8000K	
Shutter	PRESET	1/100, 1/250, 1/500, 1/1000, 1/2000 second (59.94i)	
		1/60, 1/250, 1/500, 1/1000, 1/2000 second (50i)	
	Lock Scan	1/59.94 to 1/10000 second, 1.07 (+36dB) to 0.03 second (+6dB) (59394i)	
		1/50.00 to 1/10000 second, 1.28 (+36dB) to 0.04 second (+6dB) (50i)	
Gain selection		L (low): -3/0dB M (medium): 0 to +33dB, 3dB steps H (high): +3 to +36dB, 3dB steps	
Dimensions (W x H x D)		99 (W) x 105 (H) x 155 (D) mm (excluding protrusions)	
Power consumption		approx. 17 W (DC 12V)	
Mass		approx. 1.5 kg (3.3 lbs)	
Input signals	Genlock	Tri-level sync / BB	
Output signals	HD-SDI 2 output	HD-SDI: SMPTE292M 0.8Vp-p/1.5Gbps	HD-SDI: SMPTE259M-C 0.8Vp-p/270Mbps

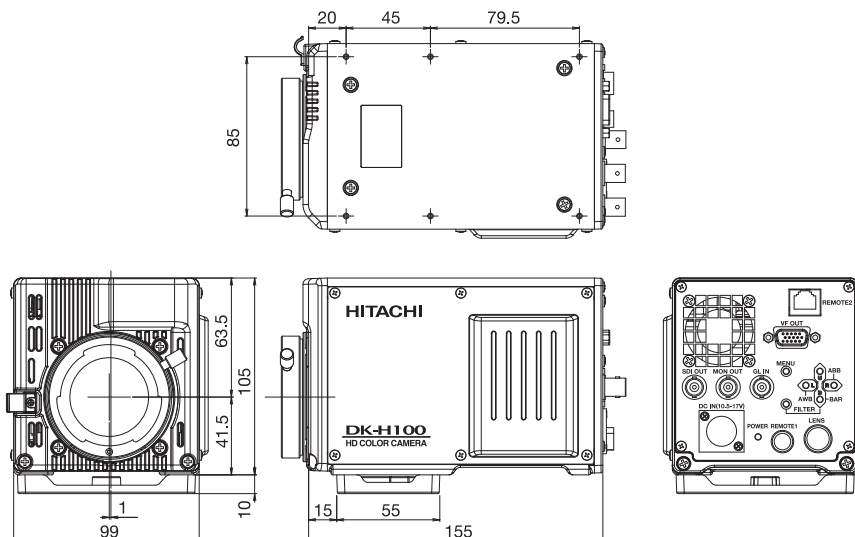
Standard composition

- Camera
- Lens mount cap
- Operation instructions

Optional accessories

- Camera control panel RU-1000VR / RU-1500JY
- AC adaptor IA-60a (I. D. X.)
- Lens extension cable ECE-R22 (0.22m) (FUJINON)

Dimensions



FULL HD
1/3" 3MOS
1080i, 720p, 480i, 576i

HV-HD33



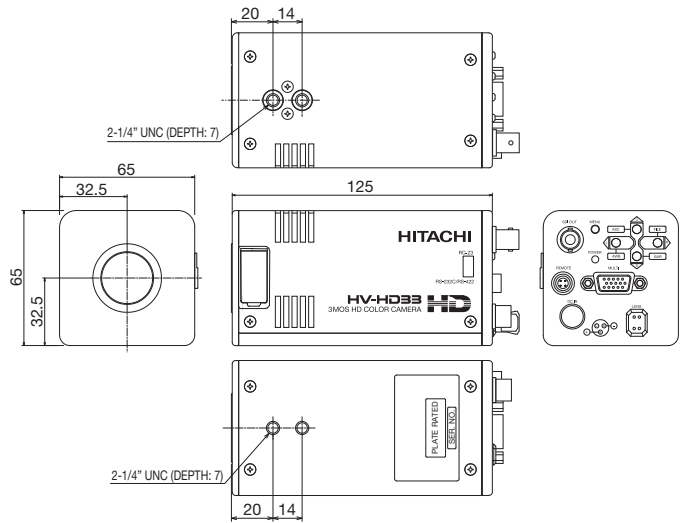
Main Features

- New MOS sensors with improved sensitivity rise of 6dB.
- Multi format HDTV SDTV output
 1080 • 59.94i/50i (16:9)
 720 • 59.94p/50p (16:9)
 480 • 59.94i (16:9)
 576 • 50i (16:9)
 480 • 59.94i (4:3)
 576 • 50i (4:3)
- Digital serial output
 HD-SDI/SD-SDI 1 output
- 6 color independent masking & Luminosity independent linear masking
- Negative positive conversion & Right and left reversing
- Camera control RS-232C/RS-422 remote controller RC-Z3

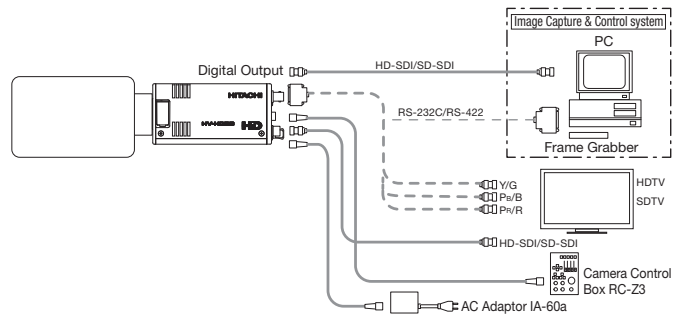
Main Specifications

Output format	HDTV 1080•59.94i/50i (16:9), 720•59.94p/50p (16:9), SDTV 480•59.94i (16:9), 576•50i (16:9) 480•59.94i (4:3), 576•50i (4:3)
Imaging device	1/3" 3MOS
Total pixels	1376(H) x 1070(V)
Effective pixels	1280(H) x 720(V)
Actual image area	4.80 mm (H) x 3.84 mm (V)
Imaging system	R. G. B. 3MOS
Optical system	1/3" F2.2 prism
Lens mount	C-mount (flange back 17.526 mm in air)
Horizontal resolution	720TV Line (HD-SDI output, Center of Screen, DTL: OFF, Ych)
Standard sensitivity	F8.0 (2000 lx, 3200K)
Minimum illumination	10 lx (F2.2, Gain: 15dB, Gamma: ON)
S/N	53dB (HD-SDI output Decode, Ych, 30MHz)
Registration	All screen 0.05% (Without lens Characteristic)
Gain	0 dB to +15 dB 1dB step
Shutter	Preset 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 Variable 1/60 to 1/11238 (59.94i/p mode, 1H (approx. 23ms) step) 1/50 to 1/9375 (50i/p mode, 1H (approx. 28ms) step)
Gamma	0.45 (ON) / 1.0 (OFF)
Scene file	4 Scene file
Color bar	ARIB bar
Power supply voltage	DC 12V (10.5V to 15V)
Power consumption	approx. 8 W
Dimensions	65 mm (W) x 65 mm (H) x 125 mm (D)
Mass	420g (except lens)
Ambient temperature	Operating -10 to 40°C Storage -20 to 60°C

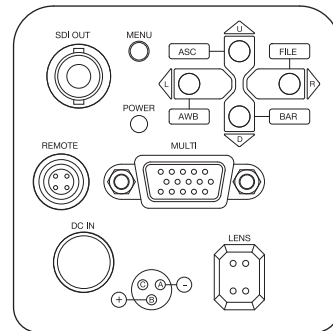
Dimensions



System configuration



Rear View



Standard composition

- Camera
- DC in plug R03-P3F
- Lens plug E4-191J-100
- Operation instructions

Optional accessories

- Camera Control Box RC-Z3
- Supports 3CCD Zoom Lens PH16X8B HS SS-H (μTRON)

FULL HD
1/2" 3CCD
 1080i, 720p, 480i, 576i
 Head/CCU Separate

HV-HD201
HV-HD201M



Photo in HV-HD201M

Main Features

Multi Format Output

The camera features a user selectable multi format output to meet the needs of the imaging application. The output is menu selectable between 1080/59.94i, 1080/50i, 720/59.94p and 720/50p for the HD-SDI and analog high definition component outputs, and the optional HDMI output (HDMI Connector: HV-HD201M only). There is also a standard definition VBS and Y/C output that is switchable between 480/ 59.94i and 576/60i.

Digital Signal Processing Enables Quality Enhancement Functions

A 12 vector color corrector with independent hue and saturation levels allows the user to achieve accurate color reproduction for use in image processing, microscopy, medical and broadcast applications.

Video Level Control

The proper video Level can be maintained through the use of an Auto Electric shutter (AES) mode for bright scenes and an intelligent Auto Level Control (ALC) for dark scenes.

Scene Files

4 user selectable scene files are available for the storage and recall of camera setup information, along with a Preset file that contains default factory setup information.

Other Functions

- AGC with programmable gain in 1dB steps.
- ARIB Color Bars
- SD memory card for user storage and recall of camera setup information.

Remote Control

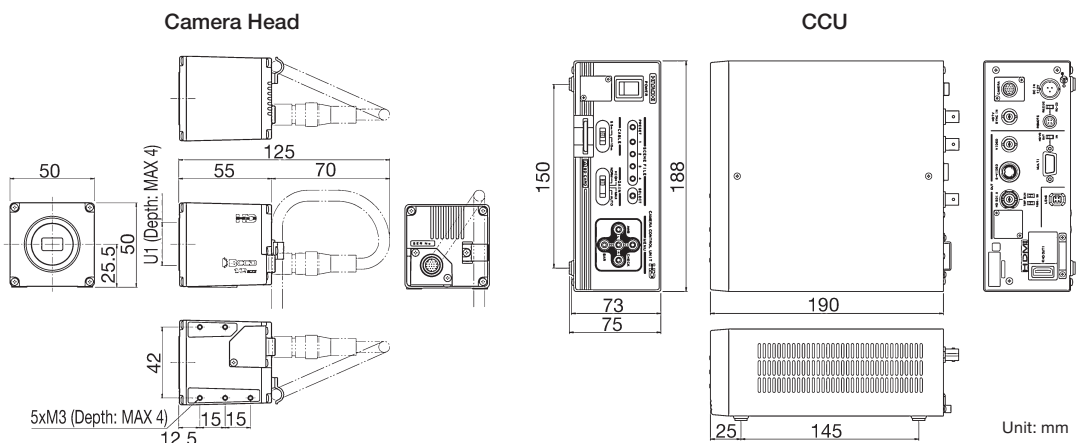
Remote control of all camera operating parameters is available using the optional Hitachi remote control or through the use of a PC.

Standard 5.5 Meter Detachable Cable (Optional 10 Meter)

Main Specifications

Scan system	1080/59.94i , 1080/50i , 720/59.94p , 720/50p , *480/59.94i , *576/50i (*: VBS ,Y/C Only)
Image sensor	1/2-size CCD image sensor (CX430ALA)
Total pixels	1504 (H) x 1099 (V)
Actual pixels	1440 (H) x 1080 (V)
Actual image area	6.98 mm (H) x 3.92 mm (V)
Imaging system	R, G, B 3-CCD
Lens mount	C-mount (flange back 17.526 mm in air)
Horizontal resolution	800 TV line (Center of luminance channel at 1080i, HD-SDI)
Standard sensitivity	F8.0 (2000lx, 3200K, reflection ratio 89.9%)
S/N	56dB
Gain	0dB to +18dB 1dB step
Shutter	Preset 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 Variable 1/59.94 to 1/10000 (1080/59.94i) , 1/50 to 1/10000 (1080/50i)
Scene file	4 Scene file
Color bar	ARIB bar
Power supply voltage	12V DC (Stable operation at 10.5 to 15 VDC)
Power consumption	Approx. 22W (HV-HD201) / Approx. 25W (HV-HD201M)
Dimension	Head : 50mm (W) x 50mm (H) x 55mm (D) CCU : 188mm (W) x 75mm (H) x 190mm (D)
Ambient temperature	0 to 40°C
Operation Storage	-20 to 60°C
Camera cable	5.5m, 10m (Option)
Input signals	HD-SYNC (3 state, for 720p or 1080i) (BNC Connector x1) Serial data (REMOTE Connector)
Output signals	<ul style="list-style-type: none"> • HD-SDI (BNC SDI- Connector x1) 0.8Vp-p / 75Ω • HD output (HDMI Connector x1, HV-HD201M only) • Analog output (D-sub 15pin Connector x1) Analog HD/SD output Y, Pb, Pr / R,G,B Y : 1.0Vp-p/75Ω, SYNC (3 state) • Composite Video (BNC Connector x1) VBS : 1.0Vp-p / 75Ω • S-VIDEO (Y/C Connector x1) Y : 1.0Vp-p / 75Ω, C : 0.285Vp-p (burst) / 75Ω, (NTSC) , C : 0.3Vp-p (burst) / 75Ω (PAL) • Serial data (REMOTE 4pin Connector x1) • LENS IRIS (LENS 4pin Connector x1 CCU)

Dimensions



FULL HD**1/3" MOS**

1080 • 59.94i/50i/30p/25p

KP-HD20A**Multi-Unit MU-HD101****Main Features****Full HD (HD-SDI) for Industrial use**

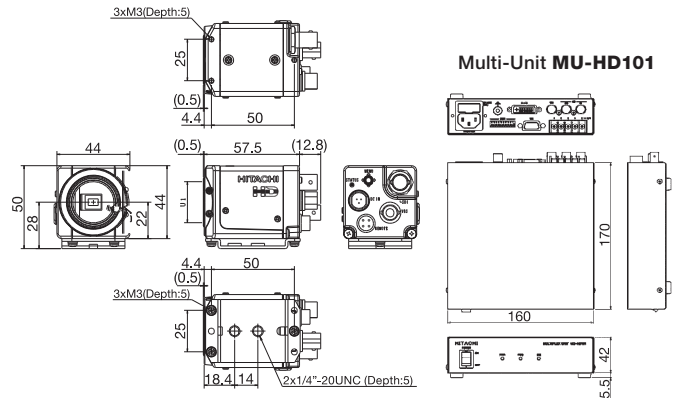
2.1 million pixel RGB Bayer CMOS sensor
External event trigger for machine vision use

Coaxial cable transmission

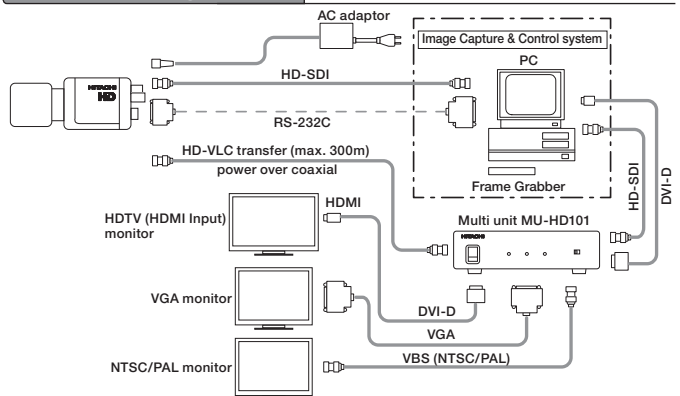
Easy replacement of conventional analogue (PAL/NTSC) camera with this full HD model, since it can transmit HD-SDI signal with existing coax cables.
Approx. 100m transmission is realized by 5C-2V. Coax cable.

Small size/light weight / high sensitivity

Compact camera body size (44mm width and height) combined with light weight make this a flexible unit for many applications.
High sensitivity of minimum photographic subject illumination 0.3lx means this camera can be used in many low light situations.

Non-compressing (except HD-VLC mode) high definition**Low delay (less than 16 ms) direct monitoring is possible.****Transmission up to 300m (using Multi Unit (MU-HD101))****Various output formats (1080, SXGA, XGA, NTSC and PAL, using Multi Unit (MU-HD101))****Power over coaxial cable is possible by using a Multi Unit (MU-HD101).****Dimensions****Main Specifications**

Imaging device	1/3" Progressive Scan CMOS
Total pixels	2010(H) x 1108(V) 2.2M pixels
Effective pixels	1944(H) x 1092(V) 2.1M pixels
Sync system	Internal
Video output	SMPTE292M (HD-SDI Std mode) / Analog CVBS
Video format	HD-SDI: 1080i 59.94/50, 1080P 30/25 CVBS: NTSC, PAL
Transmission distance	HD-SDI Std mode: max 100m (5C-FB 75ohm) HD-VLC mode: max 300m (5C-2V 75ohm/Special Multi unit MU-HD101 use) *mode selectable
Minimum illumination	Color: 0.2 lx (F1.2/ AGC42dB) B/W: 0.02 lx (F1.2/ AGC42dB) *3200K Tungstenlamp use
S/N Ratio	50dB (AGC: OFF / Weight: ON)
Resolution	800TV line
Lens mount	C/CS *C: Cmount Adaptor use
AGC	OFF / Auto (Max Gain 48dB) / Manual (0dB to +48dB) *1dB step setting
Electric shutter	OFF/ AES/ Manual (1/30 to 1/14000)
Back Light compensation	OFF/ ON (Area setting)
White Balance	ATW/ AWC/ Manual (2500K to 10000K)
Wide Dynamic Range	OFF/ DRC *DRC: contrast compensation
Picture Adjust Menu	Video level / Gamma correction / Chroma level / Black level / Enhance level
Lens control	DC Auto Iris / VIDEO Iris
Remote control	RS-232C
Power Consumption	DC+12V / Power multiplex 4.5W
Operating temperature	-10 to +45°C
Dimensions	44 (W) x 44 (H) x 59 (D) mm
Mass	Approx. 130g

System configuration**Rear View****Multi-Unit MU-HD101****Multi Unit MU-HD101 (option) Specifications**

Input video format	HD-SDI (SMPTE292M) HD cable extend-SDI (Original format)
Output format	Full HD(1080): 59.94i/50i/29.97p/25p SXGA: 60p, XGA: 60p, NTSC: 59.94i, PAL: 50i
Frame rate	Full HD: 1920x1080
Transmission distance	HD-SDI: 100m(5C-2V), 60m (3C-2V) HD cable extend-SDI: 300m (5C-2V), 170m (3C-2V)
Input	SDI input: BNC
Output	SDI output: BNC(75Ω), Analog output: BNC (75Ω) DVI-D: DVI-D(SINGLE LINK), VGA: Dsub 15pin
Remote control	RS-232C
I/O	Input x1, Output x1
Power supply	AC100V to 230V ±10%
Power Consumption	13W (Power over coaxial cable: ON) 5W (Power over coaxial cable: OFF)
Operating temperature	-10 to +45°C
Dimensions	160mm(W) x 42mm(H) x 170mm(D)mm
Mass	Approx. 700g

Standard composition

- Camera
- Operation instructions

Optional accessories

- Lens plug
- DC in plug
- Remote plug
- C/CS mount adaptor LA-D20AB
- AC adaptor
- multi unit MU-HD101

GigE
(Gigabit Ethernet)
3CCD Color

Mini
Camera Link
3CCD Color

HV-F202GV, HV-F22GV

HV-F202SCL



HV-F202GV, HV-F202SCL



HV-F22GV

Main Features

High resolution and color fidelity

The 1/1.8-inch 2,000,000 pixels (1,500,000 pixels for HV-F22GV) square lattice progressive scan CCD and the dichroic prism for RGB color achieve a high resolution of UXGA (1600(H) x 1200(V)) (SXGA (1360(H) x 1024(V) for HV-F22GV) picture and good color reproduction.

Gigabit Ethernet interface (HV-F202GV/F22GV)

Gigabit Ethernet IEEE802.3ab (1000BASE-T) support.

High-speed serial interface Gigabit Ethernet is supported and direct connection is possible to PC by the diameter cable of thin as compared with parallel output. It is possible to 100m.

GigE Vision support

A maximum of 1Gbps high speed data transmit is available and suitable for image processing.

GenICam support

Development of camera control system is easy because industrial camera control API.

PoE support (HV-F202GV only)

Power supply can be input via Ethernet cable (Power over Ethernet). When not connected to PoE, the power supply can be input from the DC IN/ SYNC connector.

CameraLink support (HV-F202SCL)

The SCL version in medium configuration can operate at 30fps at maximum pixel clock rate, full resolution and maintain 36bit output.

Mini CameraLink

The SDR connector called mini CameraLink is adopted and two connectors are equipped in a small case. Additionally, when using with L type connection, it is

arranged as cable collision does not occur.

Medium Configuration connection support

It supports Medium Configuration connection which enables the rich gradation expression of each color of 10 bit or 12 bit

C mount lens adapter

Digital processing for various picture quality enhancements

- Independent six colors masking is the Hitachi innovation for optimizing color balance. The saturation and the hue of 6 colors (Red, blue, green, cyan, magenta and yellow) are adjusted independently to deliver the best color in image capture, microscope and other applications.
- It is equipped with the in out gradation control function using LUT. Other than normal gamma 0.45 conversion, the function can set the conversion of in out gradation using look up table (LUT) as a user option (except HV-F22GV).

Auto shading correction (ASC)

Versatile CCD drive functions

- Video frame capture on demand using external trigger signal. See detailed specifications item 8.
- Long integration mode.
- Auto electric shutter (AES) mode for stabilized video level.

Versatile imaging functions

- Four application files.
- Scene color temperature is detected in dynamic for automatic white balance adjustment.
- AGC (Automatic gain control) and manual gain control are available to select.
- Master black, R/B black, and R/B gain are variable.

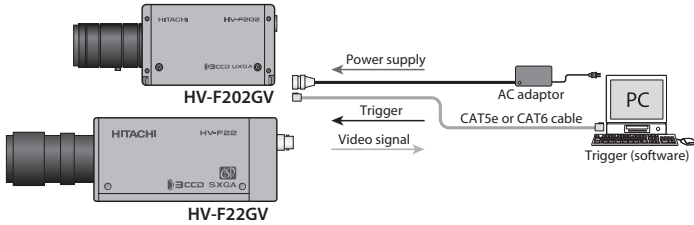
Main Specifications

		HV-F202GV	HV-F202SCL	HV-F22GV
Imaging device	Effective pixels	1/1.8-inch progressive scan interline CCD (R, G, B 3 CCD)		1/2-inch progressive scan interline CCD (R, G, B 3 CCD)
	Pixel size	1600(H) x 1200(V)		1360(H) x 1024(V)
	Optical system	4.4 μm(H) x 4.4 μm(V) (Square pixel)		4.65 μm(H) x 4.65 μm(V) (Square pixel)
Scanning area	1/1.8-inch F1.8 prism		1/2-inch F1.6 prism	
Scanning system	7.04 mm(H) x 5.28 mm(V)		6.32 mm(H) x 4.76 mm(V)	
Sync system	Progressive			
Lens mount	Internal / VD external			
Flange focal distance	C mount			
Video output	17.526 mm			
Frame rate	Frame rate (frames per second)	Gigabit Ethernet IEEE802.3ab (1000BASE-T) GigaE Vision Support GenICam Support RGB (24 bit/30 bit/ 36 bit), RAW (24 bit/30 bit/ 36 bit), YUV (24 bit/30 bit/ 36 bit)		Gigabit Ethernet IEEE802.3ab (1000BASE-T) GigaE Vision Support GenICam Support RGB (24 bit)
		Camera Link support Base Configuration / Medium Configuration Base Configuration: RGB 24bit Medium Configuration: RGB 30bit / RGB 36bit		
Sensitivity	Variable	2000 lx, F5.6, 3200K (at 1/30 second shutter)		2000 lx, F8, 3200K (at 1/30 second shutter)
		OFF / Auto(AES) / Manual (Variable)		
		1/30 to 1/100,000 second		1/15 to 1/100,000 second
Electric shutter speed	AES	1/30 to 1/100,000 second		1/15 to 1/100,000 second
	Long time integration	1/30 to approx. 4 second (1 frame step)		
External trigger shutter	Mode	Fixed shutter, One trigger, VD sync reset		Fixed shutter, One trigger
	Input	Via Gigabit Ethernet cable or DC IN/SYNC connector	Via CameraLink cable (CC1) or DC IN/SYNC connector	Via Gigabit Ethernet cable or DC IN/SYNC connector
External sync signal (Strobe out)	Input level	5 Vp-p ±0.5 V		Low: 0 V DC, High: 3 to 24 V DC
	Registration	VD output, Flash out		Flash out
Vertical Sharpness	Full Screen: 0.05% (except lens characteristics)			
White balance	2H			
Gain	Manual / One-push auto / Continuous auto			
Gamma	Manual: 0 to +12 dB, AGC: 0 to +12 dB (with limit setting)			
Color masking	0.45 / 1.0 / LUT (Look up table: user customizable)		0.45 / 1.0 (ON / OFF)	
Sharpness	OFF/ON (6 color independent masking)			
Paint black	Sharpness (DTL) level, Sharpness (DTL) width			
Black level	Adjustable			
Knee	Adjustable (Knee point and knee slope)			
Power supply	Adjustable			
Power consumption	Performance	DC+12 V ±1 V (from DC IN / SYNC connector), 48V (PoE)		DC+12 V (10.5 V to 15 V DC without ripple)
	Operating	Approx. 7.8 W (DC+12 V)		Approx. 7.2 W (DC+12 V)
Ambient temperature	Storage	Approx. 7.2 W (DC+12 V)		Approx. 9.0 W (DC+12 V)
	Performance	0 °C to +40 °C		
	Operating	-10 °C to +40 °C (without dew condensation)		
Vibration endurance	-20 °C to +60 °C			
Shock endurance	10 to 200 Hz 24.5 m/s ²			
External dimensions	392 m/s ²			
Mass	55(W) x 55(H) x 89(D) mm (not including lens and protrusions)		65(W) x 65(H) x 141(D) mm (not including lens and protrusions)	
	Approx. 350 g (without lens)		Approx. 600 g (without lens)	

System configuration

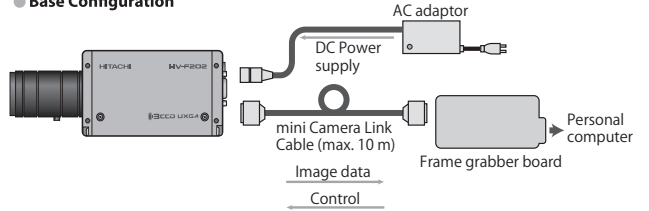
HV-F202GV / F22GV

Direct connection to PC and triggered via Ethernet (Software trigger)

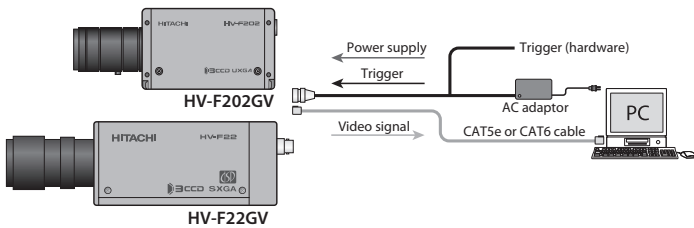


HV-F202SCL

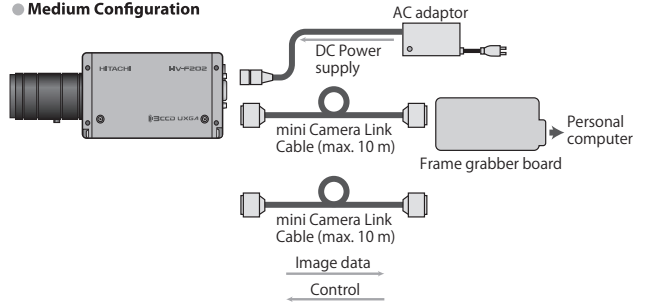
● Base Configuration



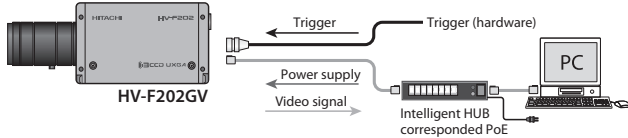
Direct connection to PC and triggered via multi-connector (Hardware trigger)



● Medium Configuration

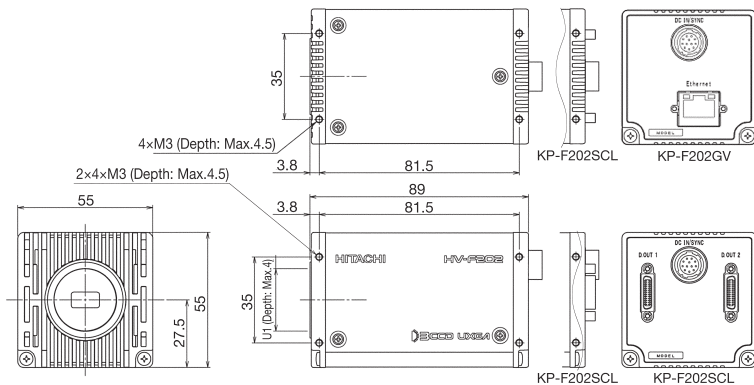


Connection via HUB/switcher to PC and power supply via the Ethernet (PoE)

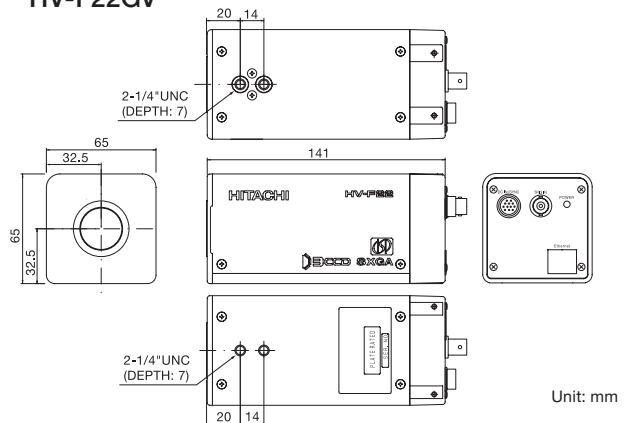


Dimensions

HV-F202GV / F202SCL



HV-F22GV



Unit: mm

Rear View



Standard composition

- Camera
- Lens mount sheet
- DC IN / SYNC connector plug (HR10A-10P-12S)
- CD-ROM (driver software) (HV-F22GV only)
- Instruction manual

Optional accessories

- AC adaptor JC-100 (included junction box)
- Junction box JU-F30
- Camera cable C-201KSM (2m, molded type), C-201KSS (2m, shield type)
C-501KSM (5m, molded type), C-501KSS (5m, shield type)
C-102KSM (10m, molded type), C-102KSS (10m, shield type)
- Mini Camera Link Cable C-101SCL (1m)
Link Cable C-201SCL (2m)
SDR-MDR C-301SCL (3m)
(for HV-F202SCL) C-501SCL (5m)
C-102SCL(HF) (for high frequency)
- Tripod adaptor TA-F202

GigE

(Gigabit Ethernet)

1CCD color (RGB/YUV/RAW)

PoE

KP-FD500GV
KP-FD202GV
KP-FD140GV
KP-FD83GV
KP-FD33GV



Main Features

Gigabit Ethernet interface

Direct connection is possible to PC by the Gigabit Ethernet cable. This cable is less bulky compared with parallel digital output cabling. GigE Cable length can be extended to maximum 100m without hub and switcher.

GigE Vision™ compatible

Based on Industrial camera interface standard GigE Vision, a maximum of 1Gbps high speed data transmission is available and suitable for image processing.

GenICam™ compatible

Development of camera control system is easy because industrial camera control API "GenICam" lead EMVA (European Machine Vision Association).

PoE correspondence

Power supply can be input via Ethernet cable (Power over Ethernet).

High resolution & High Frame rate

Model	CCD	Effective pixels	Frame rate	Model	CCD	Effective pixels	Frame rate
KP-FD500GV	2/3	2456 (H) x 2058 (V)	8 fps	KP-FD83GV	1/3	1034 (H) x 779 (V)	36 fps
KP-FD202GV	1/1.8	1628 (H) x 1236 (V)	30 fps	KP-FD33GV	1/3	656 (H) x 494 (V)	90 fps
KP-FD140GV	1/2	1392 (H) x 1040 (V)	30 fps*1				

(*1: Up to SXGA (1280(H) x 960(V)) readout)

High color fidelity

RGB primary color mosaic filter achieve high color fidelity.

Versatile CCD drive functions

- Auto electric shutter mode (AES)
Adjusted automatically from 10 second to approx. 1/100,000 second.
- Preset electric shutter mode Multi-step up to 1/50000 second in 8 steps.
- Variable electric shutter mode
Variable at 1H steps from 10 second to approx. 1/100,000 second.

White balance

ATW (Auto-tracking white balance), MANUAL (R, B gain control), One-Push

6 color 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, micro scope, etc.)

External trigger

An external trigger signal input can be used to capture an image at desired timing for instant view or processing. The software trigger via a Gigabit Ethernet cable and the hardware trigger can deal with all trigger signals.

Versatile output image format

The output format can be select RGB 8 / 10 / 12bit, YUV (4:2:2) 8 / 10 / 12bit, RAW 8 / 10 / 12bit or MONO 8 / 10 / 12bit.

Main Specifications

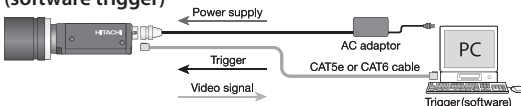
		KP-FD500GV	KP-FD202GV
Imaging device		2/3-inch progressive scan interline CCD (ICX625AQ)	1/1.8-inch progressive scan interline CCD (ICX274AQ)
	Total number of pixels	2536(H) x 2068(V)	1688(H) x 1248(V)
	No. of effective pixels	2456(H) x 2058(V)	1628(H) x 1236(V)
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)	4.4 μm(H) x 4.4 μm(V) (Square pixel)
	Color filter	RGB primary color mosaic filter	
Scanning area	8.15 mm(H) x 7.07 mm(V)		7.16 mm(H) x 5.44 mm(V)
Scanning system	Progressive		
Sync system	Internal / external		
Lens mount	C mount (Flange focal distance: 17.526 mm)		
Video output	Interface	Gigabit Ethernet	
	Protocol	GigE Vision compliant	
	Transfer rate	1 Gbit per second	
	Image format	RGB 8 / 10 / 12bit, YUV (4:2:2) 8 / 10 / 12bit, RAW 8 / 10 / 12bit, MONO 8 / 10 / 12bit	
	Image size	2448(H) x 2050(V)	1620(H) x 1220(V)
Frame rate		9 frames per second	30 frames per second
		*Frame rate (full pixel readout) is different for following format	
		RGB 8bit: 7 fps RGB 10bit: 5 fps RGB 12bit: 3 fps YUV 10/12bit: 7 fps	RGB 8bit: 18 fps RGB 10bit: 12 fps RGB 12bit: 9 fps YUV 8bit: 28 fps YUV 10/12bit: 18 fps RAW 10/12bit: 28 fps
Sensitivity	2000 lx, F11, 3200K		2000 lx, F5.6, 3200K
Electric shutter speed		OFF/Auto(AES)/Manual(PRESET or VARIABLE), OFF is normal exposure(frame rate)	
	PRESET	1/9, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	
External trigger shutter	VARIABLE	From 10 second to approx. 1/100000 second	
	Mode	Fixed shutter, One trigger, VD Sync, Reset control	
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)	
External sync signal	Input level	+5 to 24 V	
	VD output	5 Vp-p ±0.3 V	
Strobe out		5 Vp-p ±0.3 V	
	Partial scan	Grabbing image area is adjustable at 2 pixel step. Frame rate improves when vertical size is reduced.	
ALC (Auto level control)	Adjustable for video level		
White balance	ATW/MANUAL/One-push		
Gain	Auto / Manual (0dB to 12dB)		Auto / Manual (0dB to 18dB)
Gamma	OFF (γ=1) / ON		
Color masking	OFF/ON (6 color independent masking)		
Paint black, Sharpness, Black level, Knee	Adjustable		
Power supply	DC+12 V plus minus 1 V (input from 12-pin connector), 48 V (PoE)		
Power consumption	Normal	Approx. 7.4 W (Approx. 625 mA)	Approx. 7.8 W (Approx. 650 mA)
	Partial scan	Approx. 7.8 W (Approx. 650 mA) (at 2 pixel height)	Approx. 8.5 W (Approx. 710 mA) (at 2 pixel height)
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less	
	Operating	-10 °C to +50 °C / 90 %RH or less	
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)	
Vibration endurance	15 to 200 to 15Hz (98.6m/S ²), 10 minutes for each 3 axis		
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)		
External dimensions	44(W) x 29(H) x 72(D) mm (not including lens and protrusions)		
Mass	Approx. 140 g (without lens)		

Main Specifications

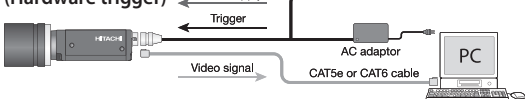
		KP-FD140GV	KP-FD83GV	KP-FD33GV
Imaging device		1/2-inch progressive scan interline CCD (ICX267AK)	1/3-inch progressive scan interline CCD (ICX204AK)	1/3-inch progressive scan interline CCD (ICX424AQ)
	Total number of pixels	1434(H) x 1050(V)	1077(H) x 788(V)	692(H) x 504(V)
	No. of effective pixels	1392(H) x 1040(V)	1034(H) x 779(V)	659(H) x 494(V)
	Pixel size	4.65 μm(H) x 4.65 μm(V) (Square pixel)		7.4 μm(H) x 7.4 μm(V) (Square pixel)
	Color filter	RGB primary color mosaic filter		
Scanning area	6.32 mm(H) x 4.76 mm(V)		4.76 mm(H) x 3.57 mm(V)	4.88 mm(H) x 3.66 mm(V)
Scanning system	Progressive			
Sync system	Internal / external			
Lens mount	C mount (Flange focal distance: 17.526 mm)			
Video output	Interface	Gigabit Ethernet		
	Protocol	GigE Vision compliant		
	Transfer rate	1 Gbit per second		
	Image format	RGB 8 / 10 / 12bit, YUV (4:2:2) 8 / 10 / 12bit, RAW 8 / 10 / 12bit, MONO 8 / 10 / 12bit		
	Image size	1360(H) x 1024(V)	1024(H) x 768(V)	659(H) x 492(V)
	Frame rate	*Frame rate (full pixel readout) is different for following format		
		30 frames per second	36 frames per second	90 frames per second
		RGB 8bit: 26 fps RGB 10bit: 18 fps RGB 12bit: 13 fps	RGB 10bit: 35 fps RGB 12bit: 24 fps	RGB 12bit: 85 fps RGB 12bit: 55 fps
Sensitivity	2000 lx, F5.6, 3200K			
Electric shutter speed		OFF/Auto(AES)/Manual(PRESET or VARIABLE), OFF is normal exposure(frame rate)		
	PRESET	1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/90, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second
	VARIABLE	From 10 second to approx. 1/100000 second		
External trigger shutter	Mode	Fixed shutter, One trigger, VD Sync, Reset control		
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)		
External sync signal	Input level	+5 to 24 V		
	VD output	5 Vp-p ±0.3 V		
	Strobe out	5 Vp-p ±0.3 V		
Partial scan	Grabbing image area is adjustable at 2 pixel step. Frame rate improves when vertical size is reduced.			
ALC (Auto level control)	Adjustable for video level			
White balance	ATW/MANUAL/One-push			
Gain	Auto / Manual (0dB to 18dB)			
Gamma	OFF (γ=1) / ON			
Color masking	OFF/ON (6 color independent masking)			
Paint black, Sharpness, Black level, Knee	Adjustable			
Power supply	DC+12 V plus minus 1 V (input from 12-pin connector), 48 V (PoE)			
Power consumption	Normal	Approx. 6.0 W (Approx. 500 mA)	Approx. 4.3 W (Approx. 360 mA)	Approx. 4.7 W (Approx. 390 mA)
	Partial scan	Approx. 7.0 W (Approx. 580 mA) (at 2 pixel height)	Approx. 4.7 W (Approx. 390 mA) (at 2 pixel height)	Approx. 5.2 W (Approx. 430 mA) (at 2 pixel height)
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less		
	Operating	-10 °C to +50 °C / 90 %RH or less		
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)		
Vibration endurance	15 to 200 to 15Hz (98.6m/S ²), 10 minutes for each 3 axis			
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)			
External dimensions	44(W) x 29(H) x 72(D) mm (not including lens and protrusions)			
Mass	Approx. 140 g (without lens)			

System configuration

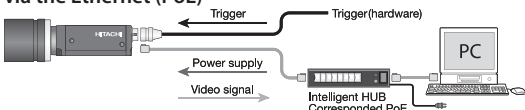
Direct connection to PC and triggered via Ethernet (software trigger)



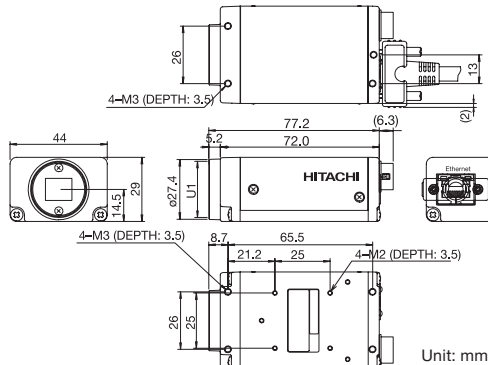
Direct connection to PC and triggered via multi-connector (Hardware trigger)



Connection via HUB/switcher to PC and power supply via the Ethernet (PoE)



Dimensions



Standard composition

- Camera

Optional accessories

- Tripod adaptor TA-M1
- Camera cable C-201KSM (2m)
- Camera cable C-501KSM (5m)
- Camera cable C-102KSM (10m)
- DC IN / SYNC connector plug HR10A-10P-12S
- Dummy glass ARC1214

GigE

(Gigabit Ethernet)
1CCD Black & White
PoE

KP-F500GV
KP-F202GV
KP-F145GV
KP-F140GV
KP-F83GV
KP-F33GV



Main Features

Gigabit Ethernet interface

Direct connection is possible to PC by the Gigabit Ethernet cable. This cable is less bulky compared with parallel digital output cabling.
GigE Cable length can be extended to maximum 100m without hub and switcher.

GigE Vision™ compatible

Based on Industrial camera interface standard GigE Vision, a maximum of 1Gbps high speed data transmission is available and suitable for image processing.

GenICam™ compatible

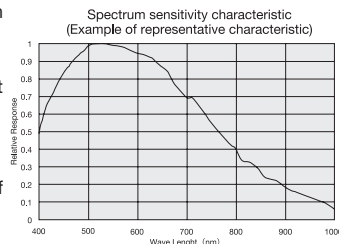
Development of camera control system is easy because industrial camera control API "GenICam" lead EMVA (European Machine Vision Association).

PoE correspondence

Power supply can be input via Ethernet cable (Power over Ethernet).

Near infrared sensitivity (KP-F145GV)

Extended spectral response allows use of the camera in the near infrared region.



High resolution & High Frame rate

Model	CCD	Effective pixels	Frame rate	Model	CCD	Effective pixels	Frame rate
KP-F500GV	2/3	2456 (H) x 2058 (V)	16 fps	KP-F140GV	1/2	1392 (H) x 1040 (V)	30 fps
KP-F202GV	1/1.8	1628 (H) x 1236 (V)	30 fps	KP-F83GV	1/3	1034 (H) x 779 (V)	36 fps
KP-F145GV	2/3	1392 (H) x 1040 (V)	30 fps	KP-F33GV	1/3	656 (H) x 494 (V)	90 fps

Versatile CCD drive functions

- Auto electric shutter mode (AES)
Adjusted automatically from 10 second to approx. 1/100,000 second.
- Preset electric shutter mode Multi-step up to 1/50000 second in 8 steps.
- Variable electric shutter mode
Variable at 1H steps from 10 second to approx. 1/100,000 second.

External trigger

An external trigger signal input can be used to capture an image at desired timing for instant view or processing. The software trigger via a Gigabit Ethernet cable and the hardware trigger can deal with all trigger signals.

Main Specifications

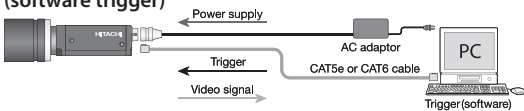
		KP-F500GV	KP-F202GV	KP-F145GV
Imaging device		2/3-inch progressive scan interline CCD (ICX625ALA)	1/1.8-inch progressive scan interline CCD (ICX274A)	2/3-inch progressive scan interline CCD (ICX285AL)
	Total number of pixels	2536(H) x 2068(V)	1688(H) x 1248(V)	1432(H) x 1050(V)
	No. of effective pixels	2456(H) x 2058(V)	1628(H) x 1236(V)	1392(H) x 1040(V)
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)	4.4 μm(H) x 4.4 μm(V) (Square pixel)	6.45 μm(H) x 6.45 μm(V) (Square pixel)
Scanning area	8.47 mm(H) x 7.10 mm(V)		7.16 mm(H) x 5.44 mm(V)	8.98 mm(H) x 6.71 mm(V)
Scanning system	Progressive			
Sync system	Internal / external			
Lens mount	C mount (Flange focal distance: 17.526 mm)			
Video output	Interface	Gigabit Ethernet		
	Protocol	GigE Vision compliant		
	Transfer rate	1 Gbit per second		
	Image format	MONO 8 / 10 / 12 bit		
	Image size	2448(H) x 2050(V)	1620(H) x 1220(V)	1360(H) x 1024(V)
Frame rate	16 frames per second		30 frames per second	
	Sensitivity			
		400 lx, F11, 3200K	2000 lx, F11, 3200K	400 lx, F4, 3200K
Electric shutter speed	OFF/Auto (AES) / Manual(PRESET or VARIABLE), OFF is normal exposure(frame rate)			
	PRESET	1/16, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	
	VARIABLE	From 10 second to approx. 1/100000 second		
External trigger shutter	Mode	Fixed shutter, One trigger, VD Sync, Reset control		
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)		
	Input level	+5 to +24 V		
External sync signal	VD output	5Vp-p ±0.3 V		
	Strobe out	5Vp-p ±0.3 V		
Binning mode	OFF / ON			
Partial scan	Grabbing image area is adjustable at 2 pixel step. Frame rate improves when vertical size is reduced.			
ALC (Auto level control)	Adjustable for video level			
Gain	Auto / Manual (0 dB to 12 dB)	Auto / Manual (0 dB to 18 dB)		
Gamma	OFF (γ=1) / ON			
Sharpness	Adjustable			
Black level	Adjustable			
Power supply	DC+12 V plus minus 1V (input from 12-pin connector), 48 V (PoE)			
Power consumption	Normal	Approx. 7.8 W (Approx. 650 mA)	Approx. 7.5 W (Approx. 625 mA)	Approx. 6.0 W (Approx. 500 mA)
	Partial scan (at 2 pixel height)	Approx. 8.4 W (Approx. 700 mA)	Approx. 8.4 W (Approx. 700 mA)	Approx. 6.6 W (Approx. 550 mA)
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less		
	Operating	-10 °C to +50 °C / 90 %RH or less		
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)		
Vibration endurance	15 to 200 to 15Hz (98.6m/S ²), 10 minutes for each 3 axis			
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)			
External dimensions	44(W) x 29(H) x 72(D) mm(not including lens and protrusions)			
Mass	Approx. 140 g (without lens)			

Main Specifications

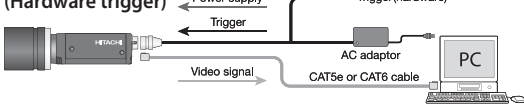
		KP-F140GV	KP-F83GV	KP-F33GV
Imaging device		1/2-inch progressive scan interline CCD (ICX267AL)	1/3-inch progressive scan interline CCD (ICX204AL0)	1/3-inch progressive scan interline CCD (ICX424AL)
	Total number of pixels	1434(H) x 1050(V)	1077(H) x 788(V)	692(H) x 504(V)
	No. of effective pixels	1392(H) x 1040(V)	1034(H) x 779(V)	659(H) x 494(V)
	Pixel size	4.65 μm(H) x 4.65 μm(V) (Square pixel)		7.4 μm(H) x 7.4 μm(V) (Square pixel)
Scanning area	6.32 mm(H) x 4.76 mm(V)		4.76 mm(H) x 3.57 mm(V)	4.88 mm(H) x 3.66 mm(V)
Scanning system	Progressive			
Sync system	Internal / external			
Lens mount	C mount (Flange focal distance: 17.526 mm)			
Video output	Interface	Gigabit Ethernet		
	Protocol	GigE Vision compliant		
	Transfer rate	1 Gbit per second		
	Image format	MONO 8 / 10 / 12 bit		
	Image size	1360(H) x 1024(V)	1024(H) x 768(V)	652(H) x 490(V)
	Frame rate	30 frames per second	36 frames per second	90 frames per second
Sensitivity	2000 lx, F11, 3200K			
Electric shutter speed		OFF/Auto (AES) / Manual(PRESET or VARIABLE), OFF is normal exposure(frame rate)		
	PRESET	1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/90, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second
	VARIABLE	From 10 second to approx. 1/100000 second		
External trigger shutter	Mode	Fixed shutter, One trigger, VD Sync, Reset control		
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)		
	Input level	+5 to +24 V		
External sync signal	VD output	5Vp-p ±0.3 V		
	Strobe out	5Vp-p ±0.3 V		
Binning mode	OFF / ON			
Partial scan	Grabbing image area is adjustable at 2 pixel step. Frame rate improves when vertical size is reduced.			
ALC (Auto level control)	Adjustable for video level			
Gain	Auto / Manual (0 dB to 18 dB)			
Gamma	OFF (γ=1) / ON			
Sharpness	Adjustable			
Black level	Adjustable			
Power supply	DC+12 V plus minus 1V (input from 12-pin connector), 48 V (PoE)			
Power consumption	Normal	Approx. 5.5 W (Approx. 450 mA)	Approx. 4.1 W (Approx. 340 mA)	Approx. 4.3 W (Approx. 360 mA)
	Partial scan	Approx. 6.5 W (Approx. 540 mA) (at 2 pixel height)	Approx. 4.8 W (Approx. 400 mA) (at 2 pixel height)	Approx. 5.0 W (Approx. 420 mA) (at 2 pixel height)
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less		
	Operating	-10 °C to +50 °C / 90 %RH or less		
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)		
Vibration endurance	15 to 200 to 15Hz (98.6m/S ²), 10 minutes for each 3 axis			
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)			
External dimensions	44(W) x 29(H) x 72(D) mm(not including lens and protrusions)			
Mass	Approx. 140 g (without lens)			

System configuration

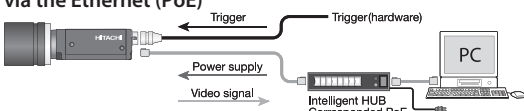
Direct connection to PC and triggered via Ethernet (software trigger)



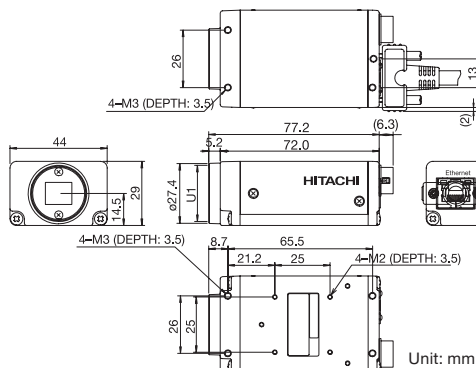
Direct connection to PC and triggered via multi-connector (Hardware trigger)



Connection via HUB/switcher to PC and power supply via the Ethernet (PoE)



Dimensions



Standard composition

- Camera

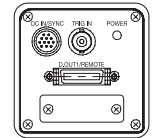
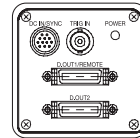
Optional accessories

- Tripod adaptor TA-M1
- Camera cable C-201KSM (2m)
- C-501KSM (5m)
- C-102KSM (10m)
- DC IN / SYNC connector plug HR10A-10P-12S
- IR-cut filter IRC650

Camera Link

3CCD Color (RGB)

HV-F22CL
HV-F22CL-S1
HV-F31CL
HV-F31CL-S1



HV-F22CL/F31CL

HV-F22CL-S1/F31CL-S1

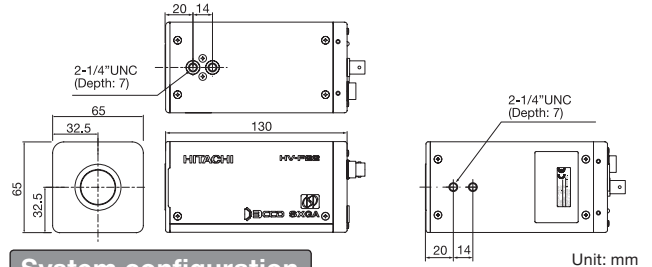
Main Features

- The best color in image capture
- High resolution
- Auto shading correction
- Independent six color masking
- External trigger shutter

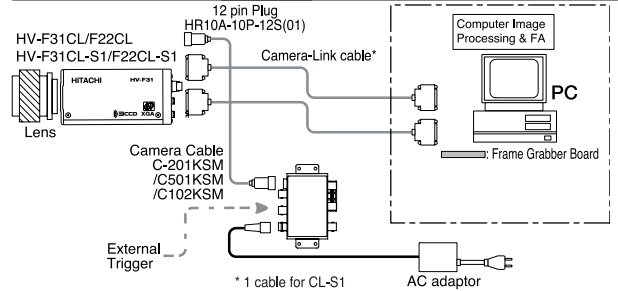
Main Specifications

		HV-F22CL / F22CL-S1	HV-F31CL / F31CL-S1
Imaging device	Effective pixels	1/2-inch interline CCD (RGB 3CCD) 1360(H) x 1024 (V)	1/3-inch interline CCD (RGB 3CCD) 1024(H) x 768 (V)
	Pixel size	4.65 μm (H) x 4.65 μm (V) (square lattice)	
	Optical system	1/2-inch F1.6 prism	1/3-inch F2.2 prism
Sensing area		6.32 mm (H) x 4.76 mm (V)	4.76 mm (H) x 3.53 mm (V)
Aspect ratio		4 : 3	
Frame rate		15 frames per second (full pixel readout)	30 frames per second (full pixel readout)
Scanning frequency		Horizontal: 16.09 kHz, Vertical: 15.06 Hz	Horizontal: 23.72 kHz, Vertical: 29.95 Hz
Sync system		Internal/external (HD/VD)	
Lens mount		C mount (Flange focal distance = 17.526 mm)	
Video output		Digital output (Camera Link) HV-F22CL/F31CL: 30bits (R: 10bit G: 10bit B: 10bit) (Medium configuration) HV-F22CL-S1/F31CL-S1: 24bits (R: 8bit G: 8bit B: 8bit) (Base configuration)	
Sensitivity		2,000 lx (F8, 100 IRE)	2,000 lx (F5.6, 100 IRE)
Electric shutter		1/100,000 to 1/15 to 4 (second)	1/100,000 to 1/30 to 4 (second)
Power supply voltage		12 V ± 10% DC	
Power consumption		Approx. 6.5 W	Approx. 6 W
Ambient	Operation	0 to +40°C	
	Storage	-20 to +60°C	
Vibration endurance		10 to 100 Hz 24.5 m/s ²	
Shock endurance		392 m/s ²	
External dimensions		65 (W) x 65 (H) x 130 (D) mm (Not including mount protrusions and lens)	
Mass		Approx. 600 g (Not including lens)	

Dimensions



System configuration



Standard composition

- Camera
- Operation instructions
- Sample Software (CD-ROM)

Optional accessories

- Camera Link cable
- Junction box ---- JU-M1A

Camera Link

1CCD Color (RGB)

KP-FD30CL



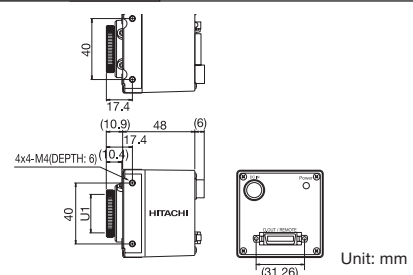
Main Features

- Suitable for the image-processing equipment input
- Small lightweight size, RGB output and various image processing function.
- Adopt digital interface (Camera Link)
- New digital signal processor (DSP)

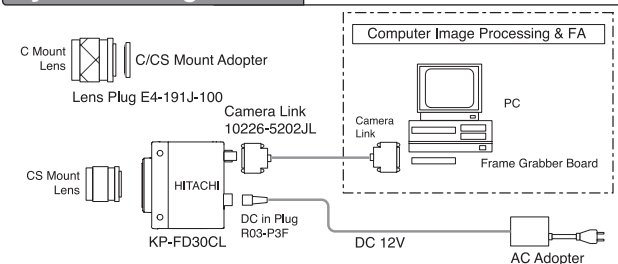
Main Specifications

		1/1.8-inch interline CCD (ICX414AQ)
Imaging device	Total pixels	692 (H) x 504 (V)
	Effective pixels	659(H) x 494 (V)
	Pixel size	9.9 μm (H) x 9.9 μm (V) (square lattice)
	Color filter	RGB primary color mosaic filter
Sensing area		6.52mm (H) x 4.89 mm (V)
Aspect ratio		4 : 3
Frame rate		60 frames per second (full pixel readout)
Scanning frequency		Horizontal: 31.486 kHz Vertical: 59.94 Hz
Sync system		Internal/external (HD/VD auto selection)
Lens mount		C/CS mount
Flange focal distance		Adjustable
Video output		Digital output (Camera Link) 24bits (R: 8bit G: 8bit B: 8bit) (Base configuration)
Sensitivity		2,000 lx (F5.6, 100 IRE)
Minimum illumination		10 lx (F1.4, MAX GAIN, 50 IRE)
Signal noise to ratio		50 dB
Electric shutter		High speed : 11 steps, OFF(1/60), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000 Low speed : 27 steps, OFF(1/60), 1/15, 1/10, 1/7.5, 1/6, 1/5, 1/3.75, 1/3, 1/2.5, 1/1.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.5, 7.0, 7.5, 8.0 second AES 1/60 to approx. 1/50,000 second (Response : SLOW NORMAL FAST) VARIABLE Approx. 1H steps from 1/60 to 1/10,000 second
Frame on demand		(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode
White balance		ATW / AWC / MANUAL
Power supply voltage		12 V ± 10% DC
Current consumption		Approx. 220 mA
Ambient	Operation	-10°C to +50°C, 30 to 80%RH
	Storage	-20°C to +60°C, 20 to 90%RH
Vibration endurance		10 to 200 Hz 68.6 m/s ²
Shock endurance		490 m/s ²
External dimensions		58 (W) x 58 (H) x 48 (D) mm (Not including mount protrusions)
Mass		Approx. 220 g

Dimensions



System configuration



Standard composition

- Camera
- Operation instructions
- C/CS-mount adaptor

Optional accessories

- Lens plug 4 pin ---- JEITA E4-191J-100
- DC in plug ---- R03-P3F
- AC adapter
- Camera Link cable

Mini Camera Link

1CCD Color (RGB)

KP-FD500SCL/PCL
KP-FD202SCL/PCL
KP-FD140SCL/PCL



KP-FD500SCL/PCL



KP-FD202SCL/PCL
 KP-FD140SCL/PCL

Main Features

Mini CL (Mini Camera Link)

By adopting a Camera Link digital interface, higher speed video data transfer is possible. Furthermore, by adopting the small connector (SDR) of a Mini Camera Link standard, the size of the camera has been reduced.

PoCL (Power over Camera Link) (KP-FDxxxPCL)

The PoCL version is connected by a single (PoCL) Mini Camera Link cable directly to a frame grabber supporting PoCL. Simple systems construction is possible.

High Resolution & High Speed

High resolution combined with high frame rates are possible with this series of cameras. Can be used for high-precision and high-speed image processing in many applications.

KP-FD500PCL/SCL	5.05 Megapixel	12 frame/second
KP-FD202PCL/SCL	2.01 Megapixel	30 frame/second
KP-FD140PCL/SCL	1.45 Megapixel	30 frame/second

Frame Shutter

Higher resolution in the vertical directional is ensured for moving object.

Multi-step Shutter

A multi-step electric shutter along with a variable speed electric shutter is standard with a minimum shutter speed of 1/100,000 second.

Frame on Demand

A one trigger and fixed shutter mode of frame-on-demand are provided allowing precise timing and exposure for image capture.

Remote Control

Through the Camera Link interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.

Selectable bit depth

Selectable bit depth of 36-/30-/24-bit

High Color Fidelity

RGB primary color mosaic filter and 14-bit accelerated DSP achieve a high color fidelity.

Selectable White Balance Adjustment

Selectable white balance adjustment method of ATW (auto-tracking), Manual (manual setting of R and B gain) or One-push (one-push auto adjustment)

6-Vector Independent Masking

A 6-Vector color corrector can be selected, allowing independent adjustment of the hue and saturation of the primary R,G,B, and complementary Cy, Mg, and Ye vectors, for accurate color reproduction of difficult objects.

Rear View



Main Specifications

		KP-FD500PCL/SCL	KP-FD202PCL/SCL	KP-FD140PCL/SCL
Imaging device		2/3-inch progressive scan interline CCD (ICX625AQ)	1/1.8-inch progressive scan interline CCD (ICX274AQ)	1/2-inch progressive scan interline CCD (ICX267AK)
	Total pixels	2536(H) x 2068(V)	1688(H) x 1248(V)	1434 (H) x 1050 (V)
	Effective pixels	2456(H) x 2058(V)	1628(H) x 1236(V)	1392 (H) x 1040 (V)
	Pixel size	3.45 μm (H) x 3.45 μm (V) (square lattice)	4.4 μm (H) x 4.4 μm (V) (square lattice)	4.65 μm (H) x 4.65 μm (V) (square lattice)
	Color filter	RGB primary color mosaic filter		
Sensing area	8.45 mm (H) x 7.07 mm (V)	7.13 mm (H) x 5.37 mm (V)	6.32 mm (H) x 4.76 mm (V)	
Scanning system	Progressive			
Aspect ratio	5 : 4	4 : 3		
Frame rate	12 frames per second (full pixel readout)		30 frames per second (full pixel readout)	
Horizontal drive frequency	48.0000 MHz	72.0000 MHz	57.6000 MHz	
Scanning frequency	Horizontal: 24.922 kHz Vertical: 11.99 Hz	Horizontal: 37.5 kHz Vertical: 29.95 Hz	Horizontal: 32.179 kHz Vertical: 30.13 Hz	
Sync system	Internal			
Lens mount	C mount (Flange focal distance = 17.526 mm)			
Video output	Interface	Camera Link 64.0000 MHz	Camera Link 72.0000 MHz	Camera Link 57.6000 MHz
	Protocol	Base configuration (1ch: SDR connector x 1pc.)	Medium configuration (2ch: SDR connector x 2pcs)	
	Output format	(a) 24bits (R: 8bit G: 8bit B: 8bit) (Base configuration) (b) 30bits (R: 10bit G: 10bit B: 10bit) (Medium configuration) (c) 36bits (R: 12bit G: 12bit B: 12bit) (Medium configuration)		
	Output image size	2448 (H) x 2050 (V) (full pixel readout)	1620(H) x 1220(V) (full pixel readout)	1360(H) x 1024(V) (full pixel readout)
Sensitivity	2000 lx, F11, 3200 K	2000 lx, F5.6, 3200 K		
Minimum illumination	5 lx (F1.4, MAX GAIN)	10 lx (F1.4, MAX GAIN)		
Signal noise to ratio	48 dB			
Electric shutter	OFF, 1/12, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (from 10 to 1/100000 second)	OFF, 1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (from 10 to 1/100000 second)		
Frame on demand	Mode: (A) Fixed shutter mode (8 steps or variable)	(B) ONE trigger mode	(C) VD reset mode	Trigger input: Camera Link (CC1) or DCIN/SYNC connector
Partial scan	Selectable start position and height of picture grabbing in 1H step.			
ALC (Auto level control)	Mode: (A) AGC (Auto gain control) (B) AES (Auto electric shutter) (C) AGC & AES Video Level: Adjustable			
Gain	Auto/Manual (0 to +12dB) (Approx. 0.0358dB step)	Auto/Manual (0 to +18dB) (Approx. 0.0358dB step)		
White balance	ATW / MANUAL / One-push			
Gamma	OFF (γ=1) / LUT			
Color masking	OFF / ON (6 vector independent masking)			
Paint black	Adjustable			
Sharpness	Adjustable			
Brightness	Adjustable			
Knee	Adjustable			
Power supply voltage	12 ± 1 VDC			
Current consumption	Approx. 310 mA (Approx. 3.7W)	Approx. 340 mA (Approx. 4.1W) *When partial scan is ON, Approx. 415 mA (Approx. 5.0W)	Approx. 300 mA (Approx. 3.6W)	
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	-10 to +50 °C (+14 to +122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to +140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	10 to 55Hz (2.37 to 71.7m/S ²), Sweep 1 minute, 30 minutes for each 3 axis			
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)			
External dimensions	44 (W) x 44 (H) x 41 (D) mm (not including mount protrusions)			
Mass	Approx. 110 g			

Mini Camera Link
1CMOS Color
(RAW)

Mini Camera Link
1CMOS Black & White
(RAW)



KP-FMR400WCL
KP-FMR200WCL

KP-FM400WCL
KP-FM200WCL

Main Features

Mini CL (Mini Camera Link)

By adopting a Camera Link digital interface, higher speed video data transfer is possible. Furthermore, by adopting the small connector (SDR) of a Mini Camera Link standard, the size of the camera has been reduced.

Automatic Selection of PoCL or non-PoCL

The power supply through the camera link cable is possible from the PoCL frame grabber board. Because the power supply from the DCIN/SYNC connector is also possible, it is possible to make the camera work by using usual frame grabber board. The power supply from the DCIN/SYNC connector is given to priority when the power supply is supplied from both.

High Resolution & High Speed

High resolution combined with high frame rates are possible with this series of cameras. Can be used for high-precision and high-speed image processing in many applications.

KP-FMR400WCL, KP-FM400WCL	2048(V) x 2048(H)	150 fps
KP-FMR200WCL, KP-FM200WCL	2048(V) x 1088(H)	280 fps

Raw Data Output

The FR series of cameras use a CCD with an RGB primary color mosaic filter, outputting the image data in a RAW format with minimal processing in order to achieve higher frame rates as compared to a normal color camera.

External image processing and software is required to produce a proper color picture.

Frame Shutter

Higher resolution in the vertical directional is ensured for moving object.

Multi-step Shutter

A multi-step electric shutter along with a variable speed electric shutter is standard with a minimum shutter speed of 1/50,000 second.

Frame on Demand

A one trigger and fixed shutter mode of frame-on-demand are provided allowing precise timing and exposure for image capture.

Remote Control

Through the Camera Link interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

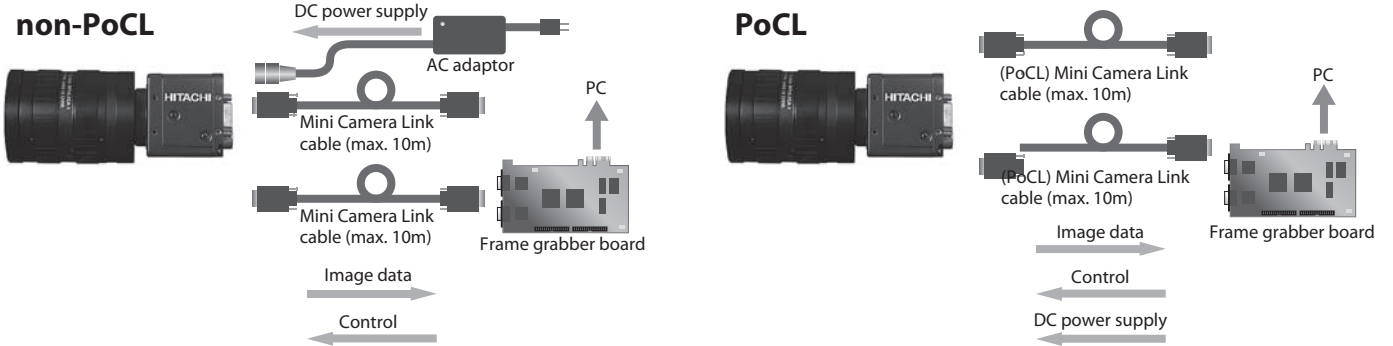
The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.

Selectable bit depth of 8 bit or 10 bit

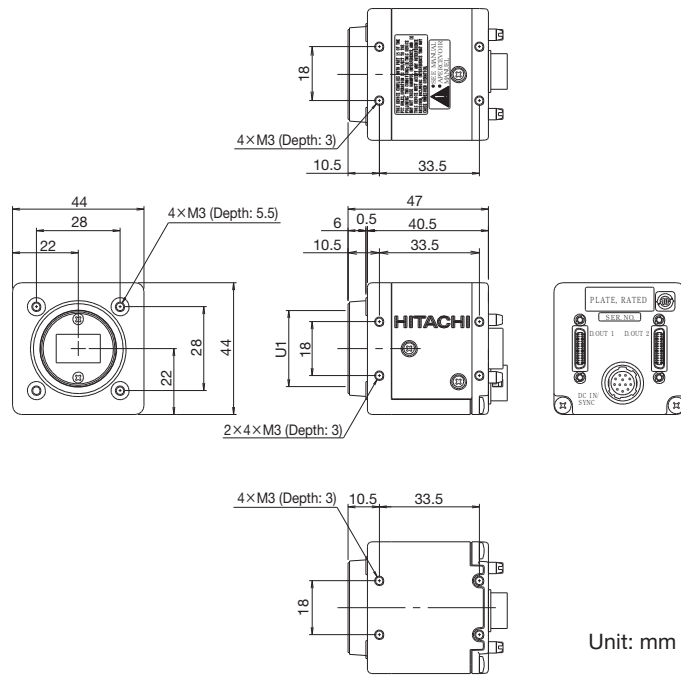
Main Specifications

		KP-FMR400WCL	KP-FM400WCL	KP-FMR200WCL	KP-FM200WCL
Imaging device		1-inch global shutter CMOS (CMV4000)		2/3-inch global shutter CMOS (CMV2000)	
	Effective pixels	2048 (H) x 2048 (V)		2048 (H) x 1088 (V)	
	Pixel size	5.5 μm (H) x 5.5 μm (V) (square lattice)			
	Color filter	RGB primary color mosaic filter	-	RGB primary color mosaic filter	-
Sensing area		11.264 mm (H) x 11.264 mm (V)		11.264 mm (H) x 5.984 mm (V)	
Scanning system		Progressive			
Aspect ratio		1 : 1		2 : 1	
Frame rate		150 frames per second (full pixel readout)		280 frames per second (full pixel readout)	
Pixel frequency		40.0000 MHz			
Horizontal scanning frequency		Full configuration: 310.078 kHz (80MHz) , 155.039 kHz (40MHz) Base configuration: 77.519 kHz (80MHz), 38.759 kHz (40MHz)		Medium configuration : 155.039 kHz (80MHz), 77.519 kHz (40MHz)	
Vertical scanning frequency		Full configuration: 150.523 Hz (80MHz), 75.445 Hz (40MHz) Medium configuration: 75.445 Hz (80MHz), 37.768 Hz (40MHz) Base configuration: 37.768 Hz (80MHz), 18.896 Hz (40MHz)		Full configuration: 281.889 Hz (80MHz), 141.588 Hz (40MHz) Medium configuration: 141.588 Hz (80MHz), 70.956 Hz (40MHz) Base configuration: 70.956 Hz (80MHz), 35.519 Hz (40MHz)	
Sync system		Internal			
Lens mount		C mount (Flange focal distance = 17.526 mm)			
Video output		Digital output (Camera Link) Base configuration 2TAP (80MHz or 40MHz) Medium configuration 4TAP (80MHz or 40MHz) Full configuration 8TAP (80MHz or 40MHz) Output image size: 2048(H) x 2048(V) (full pixel readout)		Digital output (Camera Link) Base configuration 2TAP (80MHz or 40MHz) Medium configuration 4TAP (80MHz or 40MHz) Full configuration 8TAP (80MHz or 40MHz) Output image size: 2048(H) x 1088(V) (full pixel readout)	
Resolution		Horizontal/Vertical: 1400TV lines		Horizontal/Vertical: 1000TV lines	
Sensitivity		2000 lx, F16, 3200K	400 lx, F8, 3200K	400 lx, F11, 3200 K	400 lx, F5.6, 3200 K
Signal noise to ratio		48dB			
Electric shutter		OFF, 1/38, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (16.125 μs to 211367 μs)		OFF, 1/71, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (16.125 μs to 211367 μs)	
Gamma		γ = 1			
Frame on demand	Mode	(A) Fixed shutter mode (8 steps or variable), (B) ONE trigger mode, (C) Burst trigger mode			
	Trigger input	Camera Link (CC1) or DCIN/SYNC connector			
Partial scan		Selectable start position and height of picture grabbing in 1H step.			
Power supply voltage		12 ± 1 VDC			
Current consumption		Approx. 230 mA (Approx. 2.76 W)			
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH			
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH			
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)			
Vibration endurance		10 to 200 Hz 98 m/s ²			
Shock endurance		490 m/s ²			
External dimensions		44 (W) x 44 (H) x 41 (D) mm(Not including mount protrusions)			
Mass		Approx. 130 g			

Automatic Selection of PoCL or non-PoCL



Dimensions



Rear View



Mini Camera Link

1CCD Color (RAW)

KP-FR500WCL, KP-FR230SCL/PCL, KP-FR31SCL/PCL KP-FBR30SCL/PCL, KP-FR200SCL/PCL, KP-FR80SCL/PCL, KP-FR30SCL/PCL

Main Features

Mini CL (Mini Camera Link)

By adopting a Camera Link digital interface, higher speed video data transfer is possible. Furthermore, by adopting the small connector (SDR) of a Mini Camera Link standard, the size of the camera has been reduced.

PoCL (Power over Camera Link) (-PCL model)

The PoCL version is connected by a single (PoCL) Mini Camera Link cable directly to a frame grabber supporting PoCL. Simple systems construction is possible.

Automatic Selection of PoCL or non-PoCL (KP-FR500WCL)

Raw Data Output

The FR series of cameras use a CCD with an RGB primary color mosaic filter, outputting the image data in a RAW format with minimal processing in order to achieve higher frame rates as compared to a normal color camera. External image processing and software is required to produce a proper color picture.

High Resolution & High Speed

High resolution combined with high frame rates are possible with this series of cameras. Can be used for high-precision and high-speed image processing in many applications.

KP-FR500WCL	5.05 Megapixel	16 fps	KP-FR31PCL/SCL	0.33 Megapixel	120 fps
KP-FR230PCL/SCL	2.01 Megapixel	30 fps	KP-FR30PCL/SCL	0.33 Megapixel	60 fps
KP-FR200PCL/SCL	2.01 Megapixel	15 fps	KP-FBR30PCL/SCL	0.33 Megapixel	60 fps
KP-FR80PCL/SCL	0.81 Megapixel	36 fps			

Frame Shutter

Higher resolution in the vertical directional is ensured for moving object.

Multi-step Shutter

A multi-step electric shutter along with a variable speed electric shutter is standard with a minimum shutter speed of 1/100,000 second.

Frame on Demand

A one trigger and fixed shutter mode of frame-on-demand are provided allowing precise timing and exposure for image capture.

Remote Control

Through the Camera Link interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.

Selectable bit depth

12-/10-/8-bit	KP-FR500WCL
10-/8-bit	KP-FR230SCL/PCL, KP-FR200SCL/PCL, KP-FR80SCL/PCL, KP-FR31SCL/PCL, KP-FR30SCL/PCL, KP-FBR30SCL/PCL

Main Specifications

		KP-FR500WCL	KP-FR230SCL/PCL	KP-FR31SCL/PCL	KP-FBR30 SCL/PCL
Imaging device		2/3-inch interline CCD (ICX625AQ)	1/1.8-inch interline CCD (ICX274AQ)	1/3-inch interline CCD (ICX424AQ)	
	Total pixels	2536 (H) x 2068 (V)	1688 (H) x 1248 (V)	692 (H) x 504 (V)	
	Effective pixels	2456 (H) x 2058 (V)	1628 (H) x 1236 (V)	659 (H) x 494 (V)	
	Pixel size	3.45 μm (H) x 3.45 μm (V) (square lattice)	4.4 μm (H) x 4.4 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)	
	Color filter	RGB primary color mosaic filter			
Sensing area		8.47 mm (H) x 7.10 mm (V)	7.16 mm (H) x 5.44 mm (V)	4.88 mm (H) x 3.66 mm (V)	
Scanning system		Progressive			
Aspect ratio		5 : 4	4 : 3		
Frame rate		16 frames per second (full pixel readout)	30 frames per second (full pixel readout)	120 frames per second (full pixel readout)	60 frames per second (full pixel readout)
Horizontal drive frequency		64.0000 MHz	72.0000 MHz	49.090902 MHz	25.5454 MHz
Horizontal scanning frequency		33.264 kHz	37.5 kHz	62.937 kHz	31.468 kHz
Vertical scanning frequency		16.00 Hz	29.95 Hz	119.88 Hz	59.94 Hz
Sync system		Internal			
Lens mount		C mount (Flange focal distance = 17.526 mm)			Special mount
Video output		Digital output (Camera Link) Base configuration: 64.0000 MHz x 2TAP Medium configuration: 32.0000 MHz x 4TAP (Maximum cable length: 10m) Output image size: 2456(H) x 2058(V) (full pixel readout)	Digital output (Camera Link) Base configuration: 36.0000 MHz x 2 TAP (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.545451 MHz x 2 TAP (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.5454 MHz (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)
Resolution		Horizontal/Vertical: 2000TV lines	Horizontal / Vertical: 1200 TV lines	Horizontal: 500 TV lines / Vertical: 490 TV lines	
Sensitivity		2000 lx, F8, 3200K	2000 lx, F5.6, 3200 K	2000 lx, F4, 3200 K	
Minimum illumination		15 lx (F1.4 GAIN MAX)	20 lx (F1.4, MAX GAIN)	35 lx (F1.4, MAX GAIN)	
Signal noise to ratio		48dB	45 dB	50 dB	
Electric shutter		OFF 1/16, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF, 1/30, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)
Gamma		γ = 1			
Frame on demand	Mode	(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode		
	Trigger input	Camera Link (CC1) or DCIN/SYNC connector	Camera Link (CC1)		
Partial scan		Selectable start position and height of picture grabbing in 1H step.			
Power supply voltage		12 ± 1 VDC			
Current consumption		Approx. 260 mA (Approx. 3.1W) *MAX partial scan 1H: Approx. 330 mA (Approx. 4.0W)	Approx. 270 mA (approx. 3.2 W) *MAX partial scan 1H: Approx. 360 mA (approx. 4.3W)	Approx. 190 mA (approx. 2.3 W) *MAX partial scan 1H: Approx. 230 mA (approx. 2.8 W)	Approx. 200 mA (approx. 2.4 W) *MAX partial scan 1H: Approx. 250 mA (approx. 3.0 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH			
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH			
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)			
Vibration endurance		10 to 55Hz (2.37 to 71.7m/S ²), Sweep 1 minute, 30 minutes for each 3 axis	10 to 200Hz (98 m/s ²), Sweep 10 minute, 30 minutes for each 3 axis		
Shock endurance		490.3 m/s ² (Once for each side of top, under, left and right)	686 m/s ² (Once for each side of top, under, left and right)		
External dimensions		44 (W) x 44 (H) x 41 (D) mm (Not including mount protrusions)	29 (W) x 29 (W) x 38 (D) mm (Not including protrusions)		Head: 12 (W) x 12.5 (H) x 47.5 (D) mm CCU: 29 (W) x 29 (H) x 38 (D) mm
Mass		Approx. 110 g	Approx. 50 g		Head: Approx. 18 g CCU: Approx. 50g (without cable)



KP-FR500WCL



KP-FR230SCL/PCL
KP-FR31SCL/PCL



KP-FBR30SCL/PCL



KP-FR200SCL/PCL, KP-FR80SCL/PCL
KP-FR30SCL/PCL

Main Specifications

		KP-FR200PCL/SCL	KP-FR80PCL/SCL	KP-FR30PCL/SCL
Imaging device	Total pixels	1/1.8-inch interline CCD (ICX274AQ)	1/3-inch interline CCD (ICX204AK)	1/3-inch interline CCD (ICX424AQ)
	Effective pixels	1688 (H) x 1248 (V)	1077 (H) x 788 (V)	692 (H) x 504 (V)
	Pixel size	4.4 μm (H) x 4.4 μm (V) (square lattice)	4.65 μm (H) x 4.65 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)
	Color filter	RGB primary color mosaic filter		
Sensing area		7.16 mm (H) x 5.44 mm (V)	4.76 mm (H) x 3.57 mm (V)	4.88 mm (H) x 3.66 mm (V)
Scanning system		Progressive		
Aspect ratio		4 : 3		
Frame rate		15 frames per second (full pixel readout)	36 frames per second (full pixel readout)	60 frames per second (full pixel readout)
Horizontal drive frequency		36.0000 MHz		25.5454 MHz
Horizontal scanning frequency		18.75 kHz	28.346 kHz	31.468 kHz
Vertical scanning frequency		14.97 Hz	35.79 Hz	59.94 Hz
Sync system		Internal		
Lens mount		C mount (Flange focal distance =17.526 mm)		
Video output		Digital output (Camera Link) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.5454 MHz (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)
Resolution		Horizontal / Vertical: 1200 TV lines	Horizontal / Vertical: Approx. 800 TV lines	Horizontal: 500 TV lines / Vertical: 490 TV lines
Sensitivity		2000 lx, F8, 3200 K	2000 lx, F4, 3200 K	2000 lx, F5.6, 3200 K
Minimum illumination		5.0 lx (F1.4, MAX GAIN)	20 lx (F1.4, MAX GAIN)	10 lx (F1.4, MAX GAIN)
Signal noise to ratio		50 dB		
Electric shutter		OFF, 1/15, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)
Gamma		γ = 1		
Frame on demand	Mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) Reset control mode (D) VD reset mode
	Trigger input	Camera Link (CC1) *When Reset control mode CC1 and CC2 are used		
Partial scan		Selectable start position and height of picture grabbing in 1H step.		
Power supply voltage		12 ± 1 VDC		
Current consumption		Approx. 170 mA (approx. 2.1 W)	Approx. 120 mA (approx. 1.5 W)	Approx. 120 mA (approx. 1.5 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance		10 to 200Hz (98 m/s ²). Sweep 10 minute, 30 minutes for each 3 axis		
Shock endurance		686 m/s ² (Once for each side of top, under, left and right)		
External dimensions		29 (W) x 29 (W) x 29 (D) mm (Not including protrusions)		
Mass		Approx. 50 g		

Rear View

KP-FR500WCL



KP-FR230 SCL KP-FR200 SCL
KP-FR80 SCL KP-FR31 SCL
KP-FR30 SCL KP-FBR30 SCL (CCU)



KP-FR230PCL KP-FR200 PCL
KP-FR80PCL KP-FR31PCL
KP-FR30PCL KP-FBR30PCL (CCU)



Mini Camera Link 1CCD Black & White

KP-F500WCL, KP-F230SCL/PCL, KP-F145WCL, KP-F31SCL/PCL, KP-FB30SCL/PCL, KP-F200SCL/PCL, KP-F80SCL/PCL, KP-F30SCL/PCL

Main Features

High Resolution & High Speed

High resolution combined with high frame rates are possible with this series of cameras. Can be used for high-precision and high-speed image processing in many applications.

KP-F500WCL	5.05 Megapixel	16 fps	KP-F80PCL/SCL	0.81 Megapixel	36 fps
KP-F230PCL/SCL	2.01 Megapixel	30 fps	KP-F31PCL/SCL	0.33 Megapixel	120 fps
KP-F145WCL	1.45 Megapixel	30 fps	KP-F30PCL/SCL	0.33 Megapixel	60 fps
KP-F200PCL/SCL	2.01 Megapixel	15 fps	KP-FB30PCL/SCL	0.33 Megapixel	60 fps

Mini CL (Mini Camera Link)

By adopting a Camera Link digital interface, higher speed video data transfer is possible. Furthermore, by adopting the small connector (SDR) of a Mini Camera Link standard, the size of the camera has been reduced.

PoCL (Power over Camera Link)

The PoCL version is connected by a single (PoCL) Mini Camera Link cable directly to a frame grabber supporting PoCL. Simple systems construction is possible.

Automatic Selection of PoCL or non-PoCL (KP-F500WCL/F145WCL)

Near infrared sensitivity (KP-F145WCL)

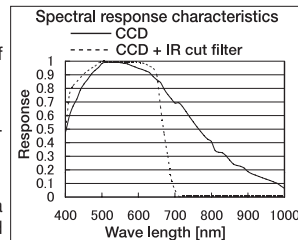
Extended spectral response allows use of the camera in the near infrared region.

Frame Shutter

Higher resolution in the vertical direction is ensured in moving object.

Multi-step Shutter

A multi-step electric shutter along with a variable speed electric shutter is standard with a minimum shutter speed of 1/100,000 second.



Main Specifications

	KP-F500WCL	KP-F145WCL	KP-F230SCL/PCL	KP-F31SCL/PCL	KP-FB30SCL/PCL
Imaging device	2/3-inch interline CCD (ICX625ALA)	2/3-inch interline CCD (ICX285AL)	1/1.8-inch interline CCD (ICX274AL)	1/3-inch interline CCD (ICX424AL)	
Imaging device	Total pixels	2536 (H) x 2068 (V)	1432 (H) x 1050 (V)	1688 (H) x 1248 (V)	692 (H) x 504 (V)
	Effective pixels	2456 (H) x 2058 (V)	1392 (H) x 1040 (V)	1628 (H) x 1236 (V)	659 (H) x 494 (V)
	Pixel size	3.45 μm (H) x 3.45 μm (V) (square lattice)	6.45 μm (H) x 6.45 μm (V) (square lattice)	4.4 μm (H) x 4.4 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)
Sensing area	8.47 mm (H) x 7.10 mm (V)	8.98 mm (H) x 6.71 mm (V)	7.16 mm (H) x 5.44 mm (V)	4.88 mm (H) x 3.66 mm (V)	
Scanning system	Progressive				
Aspect ratio	5 : 4	4 : 3			
Frame rate	16 frames per second (full pixel readout) 32 frames per second (vertical 2 pixel addition)	30 frames per second (full pixel readout) 60 frames per second (vertical 2 pixel addition)	30 frames per second (full pixel readout) 54 frames per second (vertical 2 pixel addition)	120 frames per second (full pixel readout) 219 frames per second (vertical 2 pixel addition)	60 frames per second (full pixel readout)
Horizontal drive frequency	64.0000 MHz	57.6000 MHz	72.0000 MHz	49.090902 MHz	25.5454 MHz
Horizontal scanning frequency	33.264 kHz	32.07 kHz	37.5 kHz, 33.898 kHz (vertical 2 pixel addition)	62.937 kHz, 57.618 kHz (vertical 2 pixel addition)	31.468 kHz
Vertical scanning frequency	16.00 Hz (full pixel readout) 31.98 Hz (vertical 2 pixel addition mode)	30.03 Hz (full pixel readout) 59.95 Hz (vertical 2 pixel addition mode)	29.95 Hz (full pixel readout) 54.06 Hz (vertical 2 pixel addition mode)	119.88 Hz (full pixel readout) 219.08 Hz (vertical 2 pixel addition mode)	59.94 Hz
Sync system	Internal				
Lens mount	C mount (Flange focal distance = 17.526 mm)				Special mount (Flange focal distance = 8.4 mm)
Video output	Digital output (Camera Link) Base configuration: 64.0000 MHz x 2TAP Medium configuration: 32.0000 MHz x 4TAP (Maximum cable length is 10 m) Output image size: 2456(H) x 2058(V) (full pixel readout)	Digital output (Camera Link) Base configuration: 28.8000 MHz x 2TAP (Maximum cable length: 10 m) Output image size: 1392(H) x 1040(V) (full pixel readout)	Digital output (Camera Link) Base configuration: 36.0000 MHz x 2 TAP (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.545451 MHz x 2 TAP (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.5454 MHz Output image size: 659 (H) x 494 (V) (full pixel readout)
Resolution	Horizontal/Vertical: 2000TV lines	Horizontal/Vertical: 1000TV lines	Horizontal / Vertical: 1200 TV lines	Horizontal: 500 TV lines / Vertical: 490 TV lines	
Sensitivity	500 lx, F11, 3200 K	400 lx, F8, 3200 K	500 lx, F5.6, 3200 K	550 lx, F4, 3200 K	750 lx, F5.6, 3200 K
Minimum illumination	1.0 lx (F1.4, MAX GAIN)	2.0 lx (F1.4, MAX GAIN)	3.9 lx (F1.4, MAX GAIN)	8.6 lx (F1.4, MAX GAIN)	5.9 lx, F1.4, MAX GAIN
Signal noise to ratio	48dB	48 dB	45 dB	50 dB	
Electric shutter	OFF 1/16, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF, 1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF, 1/30, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)
Gamma	γ = 1				
Frame on demand	Mode	(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode (C) VD reset mode		(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode	
	Trigger input	Camera Link (CC1) or DCIN/SYNC connector		Camera Link (CC1)	
Partial scan	Selectable start position and height of picture grabbing in 1H step.				
Power supply voltage	12 ± 1 VDC				
Current consumption	Approx. 260 mA (Approx. 3.1W) *MAX partial scan 1H: Approx. 330 mA (Approx. 4.0W)	Approx. 230 mA (Approx. 2.8W) *MAX partial scan 1H: Approx. 350 mA (Approx. 4.2W)	Approx. 270 mA (approx. 3.2 W) *MAX partial scan 1H: Approx. 360 mA (approx. 4.3W)	Approx. 190 mA (approx. 2.3 W) *MAX partial scan 1H: Approx. 230 mA (approx. 2.8 W)	Approx. 200 mA (approx. 2.4 W) *MAX partial scan 1H: Approx. 250 mA (approx. 3.0 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH			
	Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH			
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)			
Vibration endurance	10 to 55Hz (2.37 to 71.7m/S ²), Sweep 1 minute, 30 minutes for each 3 axis		10 to 200Hz (98 m/s ²), Sweep 10 minute, 30 minutes for each 3 axis		
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)		686 m/s ² (Once for each side of top, under, left and right)		
External dimensions	44 (W) x 44 (H) x 41 (D) mm (Not including protrusions)		29 (W) x 29 (W) x 38 (D) mm (Not including protrusions)		Head: 12 (W) x 12.5 (H) x 47.5 (D) mm CCU: 29 (W) x 29 (H) x 38 (D) mm
Mass	Approx. 110 g		Approx. 50 g		Head: Approx. 18 g CCU: Approx. 50g (without cable)



KP-F500WCL
KP-F145WCL



KP-F230SCL/PCL
KP-F31SCL/PCL



KP-FB30SCL/PCL



KP-F200SCL/PCL, KP-F80SCL/PCL
KP-F30SCL/PCL

Main Features

Frame on Demand

A one trigger and fixed shutter mode of frame-on-demand are provided allowing precise timing and exposure for image capture.

Remote Control

Through the Camera Link interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.

Selectable bit depth

12-/10-/8-bit	KP-F500SCL/WCL/PCL, KP-F145WCL
10-/8-bit	KP-F230SCL/PCL, KP-F200SCL/PCL, KP-F80SCL/PCL, KP-F31SCL/PCL, KP-F30SCL/PCL, KP-FB30SCL/PCL

Main Specifications

		KP-F200PCL/SCL	KP-F80PCL/SCL	KP-F30PCL/SCL
Imaging device	Total pixels	1/1.8-inch interline CCD (ICX274AL) 1688 (H) x 1248 (V)	1/3-inch interline CCD (ICX204AL) 1077 (H) x 788 (V)	1/3-inch interline CCD (ICX424AL) 692 (H) x 504 (V)
	Effective pixels	1628 (H) x 1236 (V)	1034 (H) x 779 (V)	659 (H) x 494 (V)
	Pixel size	4.4 μm (H) x 4.4 μm (V) (square lattice)	4.65 μm (H) x 4.65 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)
Sensing area		7.16 mm (H) x 5.44 mm (V)	4.76 mm (H) x 3.57 mm (V)	4.88 mm (H) x 3.66 mm (V)
Scanning system		Progressive		
Aspect ratio		4 : 3		
Frame rate		15 frames per second (full pixel readout)	36 frames per second (full pixel readout)	60 frames per second (full pixel readout)
Horizontal drive frequency		36.0000 MHz		25.5454 MHz
Horizontal scanning frequency		18.75 kHz	28.346 kHz	31.468 kHz
Vertical scanning frequency		14.97 Hz	35.79 Hz	59.94 Hz
Sync system		Internal		
Lens mount		C mount (Flange focal distance =17.526 mm)		
Video output		Digital output (Camera Link) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.5454 MHz (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)
Resolution		Horizontal / Vertical: 1200 TV lines	Horizontal / Vertical: Approx. 800 TV lines	
Sensitivity		400 lx, F4, 3200 K	400 lx, F2.8, 3200 K	400 lx, F4, 3200 K
Minimum illumination		1.0 lx (F1.4, MAX GAIN, without IR cut filter)	1.0 lx (F1.4, MAX GAIN, without IR cut filter)	1.0 lx (F1.4, MAX GAIN, without IR cut filter)
Signal noise to ratio		50 dB		
Electric shutter		OFF, 1/15, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)
Gamma		$\gamma = 1$		
Frame on demand	Mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) Reset control mode (D) VD reset mode
	Trigger input	Camera Link (CC1) *When Reset control mode CC1 and CC2 are used		
Partial scan		Selectable start position and height of picture grabbing in 1H step.		
Power supply voltage		12 ± 1 VDC		
Current consumption		Approx. 170 mA (approx. 2.1 W)	Approx. 120 mA (approx. 1.5 W)	Approx. 120 mA (approx. 1.5 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance		10 to 200Hz (98 m/s ²). Sweep 10 minute, 30 minutes for each 3 axis		
Shock endurance		686 m/s ² (Once for each side of top, under, left and right)		
External dimensions		29 (W) x 29 (W) x 29 (D) mm (Not including protrusions)		
Mass		Approx. 50 g		

Rear View

KP-F500WCL, KP-F145WCL



KP-F230 SCL KP-F200 SCL
KP-F80 SCL KP-F31 SCL
KP-F30 SCL KP-FB30 SCL (CCU)



KP-F230PCL KP-F200 PCL
KP-F80PCL KP-F31PCL
KP-F30PCL KP-FB30PCL (CCU)



Mini Camera Link Common Data

System configuration

PoCL System

● Base Configuration

KP-FM400WCL KP-FR500WCL
KP-FMR200WCL KP-FD500PCL
KP-F500WCL

KP-FM200WCL KP-FD202PCL
KP-FMR200WCL KP-FD140PCL
KP-F145WCL

KP-F230PCL KP-FR230PCL
KP-F31PCL KP-FR31PCL

KP-F200PCL KP-FR200PCL
KP-F80PCL KP-FR80PCL
KP-F30PCL KP-FR30PCL

KP-FB30PCL
KP-FR30PCL

Cable length: 3m (standard)

● Medium Configuration

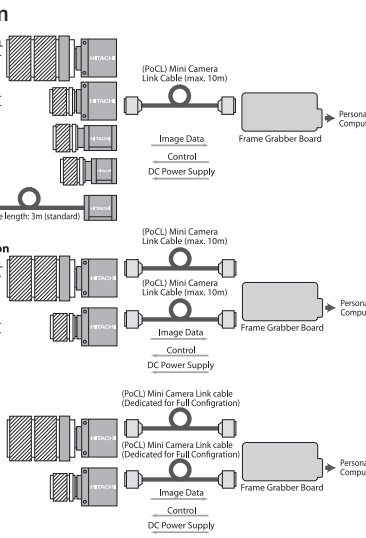
KP-FM400WCL KP-FR500WCL
KP-FMR400WCL KP-FD500PCL
KP-F500WCL

KP-FM200WCL KP-FD202PCL
KP-FMR200WCL KP-FD140PCL

● Full Configuration

KP-FM400WCL
KP-FMR400WCL

KP-FM200WCL
KP-FMR200WCL



Non-PoCL System

● Base Configuration

KP-FM400WCL KP-FR500WCL
KP-FMR400WCL KP-FD500SCL
KP-F500WCL

KP-FM200WCL KP-FD202SCL
KP-FMR200WCL KP-FD140SCL
KP-F145WCL

KP-F230SCL KP-FR230SCL
KP-F31SCL KP-FR31SCL

KP-F200SCL KP-FR200SCL
KP-F80SCL KP-FR80SCL
KP-F30SCL KP-FR30SCL

KP-FB30SCL
KP-FR30SCL

Cable length: 3m (standard)

● Medium Configuration

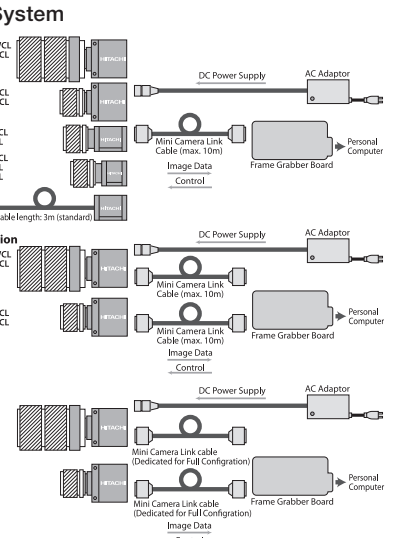
KP-FM400WCL KP-FR500WCL
KP-FMR400WCL KP-FD500SCL
KP-F500WCL

KP-FM200WCL KP-FD202SCL
KP-FMR200WCL KP-FD140SCL

● Full Configuration

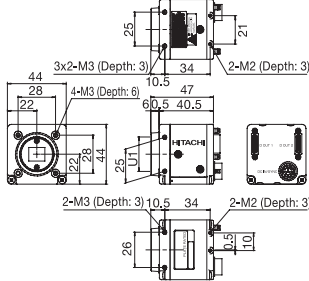
KP-FM400WCL
KP-FMR400WCL

KP-FM200WCL
KP-FMR200WCL

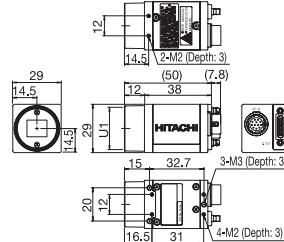


Dimensions

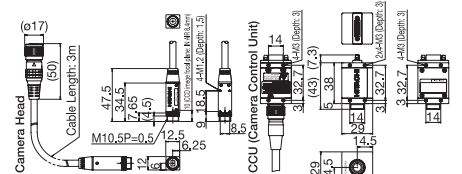
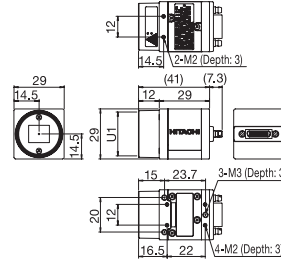
KP-FD500SCL/PCL, KP-FR500WCL
KP-F500WCL, KP-FD202SCL/PCL,
KP-FD140SCL/PCL, KP-F145WCL



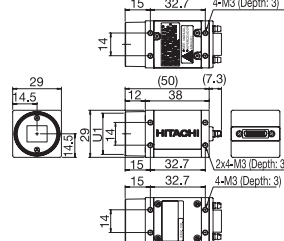
KP-FR230/F230SCL,
KP-FR31/F31SCL



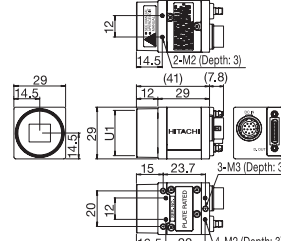
KP-FR200/F200SCL, KP-FR80/F80SCL
KP-FR30/F30SCL



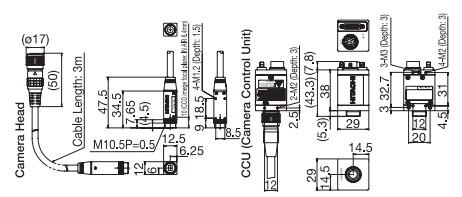
KP-FR230PCL/F230PCL
KP-FR31PCL/F31PCL



KP-FR200/F200PCL, KP-FR80/F80PCL
KP-FR30/F30PCL



KP-FBR30/FB30PCL



Unit: mm

Optional accessories

Type		WCL Type				SCL Type				PCL Type																
Model Name		KP-FR500WCL	KP-F5000WCL	KP-FMR400WCL	KP-FM400WCL	KP-F145WCL	KP-FD500SCL	KP-FD202SCL	KP-FD140SCL	KP-FR230SCL	KP-FR31SCL	KP-F230SCL	KP-FR80SCL	KP-F30SCL	KP-FBR30SCL	KP-FB30SCL	KP-FD500PCL	KP-FD202PCL	KP-FD140PCL	KP-FR230PCL	KP-FR31PCL	KP-F230PCL	KP-FR80PCL	KP-F30PCL	KP-FBR30PCL	KP-FB30PCL
Junction Box		JU-M1A																								
Tripod Adaptor		JU-F1																								
		JU-F30																								
		TA-F500																								
		TA-F230																								
		TA-F200S																								
		TA-FM200																								
		TA-FB30/FB30P																								
Mini Camera Link Cable		(1m)																								
SDR-MDR		(2m)																								
(for High Frequency)		(3m)																								
		(5m)																								
		(10m)																								
		(10m)																								
PoCL Cable		(1m)																								
SDR-SDR		(2m)																								
		(3m)																								
		(5m)																								
		(10m)																								
PoCL Cable		(1m)																								
SDR-MDR		(2m)																								
		(3m)																								
		(5m)																								
		(10m)																								
Camera Cable		(2m)																								
		(5m)																								
		(10m)																								
12 Pin Plug		HR10A-10P-12S																								
Dummy Glass		ARC1214																								
		ARC1616																								
IR Cut Filter		IRC650																								
		IRC1616																								

(*1) : JU-F30 can be used only to input or output Trigger signal etc. Power cannot be supplied. (*2) : Available for only KP-FD140SCL. (*3) : Available for only KP-FD140PCL.
 (*4) : ARC1214 is equipped in the F-type camera. (*5) : IRC650 is equipped in the FD/FR-type camera. (*6) : ARC1616 is equipped in the FM-type camera.
 (*7) : IRC1616 is equipped in the FMR-type camera. (*8) : IRC650 is equipped in the FR-type camera. (*9) : IRC650 is equipped in the camera.
 (*10) : When using KP-FMR400WCL/FM400WCL/FMR200WCL/FM200WCL in Full Configuration mode, please use the dedicated cable for Full Configuration.

Camera Link 1CCD Black & White

KP-F120CL



Main Features

High speed read out

Full pixel independent readout: 30 frames/second.

High resolution

2/3-inch CCD.

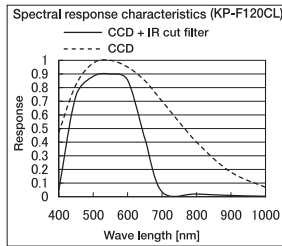
Effective pixels 1392(H) X 1040(V) and square lattice pixels.

Near infrared sensitivity

Extended spectral response allows use of the camera in the near infrared region.

Digital output

Camera Link



Full frame shutter

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

Multi step electric shutter

8 steps electric shutter up 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.

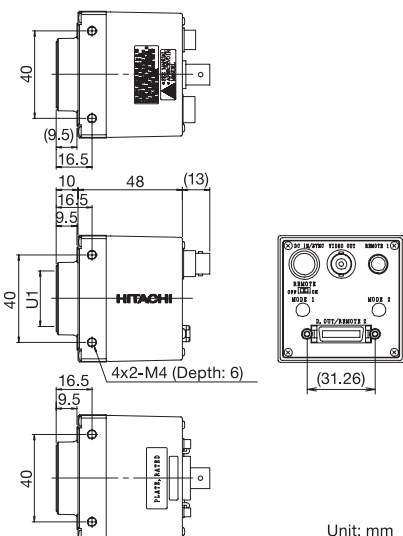
Remote control

Frame on demand, partial scan, etc. by remote control or rear panel switch.

Main Specifications

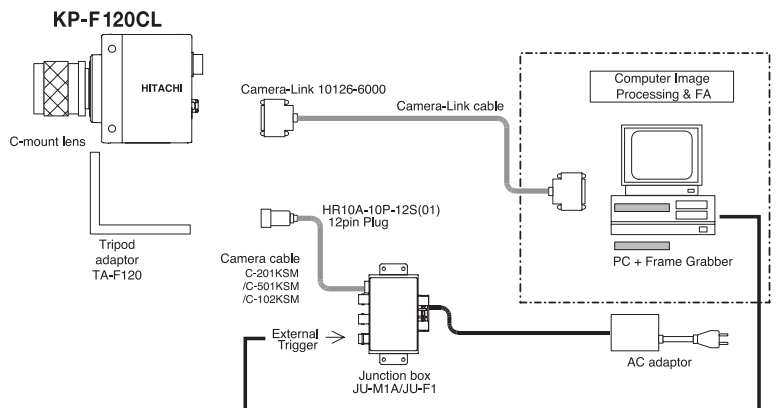
Imaging device	Total pixels	2/3-inch interline CCD (ICX285AL) 1432 (H) x 1050 (V)
	Effective pixels	1392(H) x 1040 (V)
	Pixel size	6.45 μm (H) x 6.45 μm (V) (square lattice)
	Sensing area	8.98 mm (H) x 6.71 mm (V)
Aspect ratio	4 : 3	
Frame rate	30 frames per second (full pixel readout)	
Horizontal scanning frequency	32.07 kHz	
Vertical scanning frequency	30 Hz	
Sync system	Internal/external (HD/VD)	
Lens mount	C mount (Flange focal distance=17.526 mm)	
Video output	Digital output (Camera Link) Maximum cable length: 10m or analog output for image checking	
External sync input	HD/VD LVDS level	
Electric shutter	1/30, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate)	
Gamma	γ = 1	
Frame on demand	(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode (C) TWO trigger mode (D) Smear reduction mode (E) Partial scan mode	
Power supply voltage	12 ± 1 VDC	
Current consumption	Approx. 400 mA	
Ambient	Operation	0 to 40°C (+32 to +104°F), less than 90 % RH
	Storage	-10 to 50°C (+14 to +122°F), less than 70 % RH
Vibration endurance	10 to 200 Hz 68.6 m/s ²	
Shock endurance	490 m/s ²	
External dimensions	58 (W) x 58 (H) x 48 (D) mm (Not including mount protrusions)	
Mass	Approx. 220 g	

Dimensions



Unit: mm

System configuration



Optional accessories

- Camera
- Operation instructions

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

**Camera Link
(PoCL-Lite)
1CCD Black & White**

**KP-F200Lite
KP-F80Lite
KP-F30Lite**

**Camera Link
(PoCL-Lite)
1CMOS Black & White**

**KP-FM30Lite
KP-FBM30Lite**

Main Features

- **Small 14-pin connector compatible PoCL-Lite**
Achieve approx. 3/4 size of Mini Camera Link connector.
- **Compact body**
21.5mm square (KP-FM30Lite/FBM30Lite), 29mm square (KP-F200Lite/F80Lite/F30Lite)
- **4CH connection**
Connectable to a 4CH frame grabber board
- **Single cable connection**
Single cable connection allows the camera control and video signal transmission and power supply.
- **High Resolution & High Speed**
High resolution combined with high frame rates are possible with this series of cameras. Can be used for high-precision and high-speed image processing in many applications.

- **Integrated PoCL-Lite Cable (KP-FBM30Lite)**
Integrated PoCL-Lite cable, to achieve small, including the cable connection.
- **Frame Shutter**
Higher resolution in the vertical directional is ensured for moving object.
- **Multi-step Shutter**
A multi-step electric shutter along with a variable speed electric shutter is standard with a minimum shutter speed of 1/100,000 second.
- **Frame on Demand**
A one trigger and fixed shutter mode of frame-on-demand are provided allowing precise timing and exposure for image capture.
- **Remote Control**
Through the Camera Link interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.
- **Partial Scan**
The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.
- **Selectable bit depth**
Selectable bit depth of 8 bit or 10 bit.

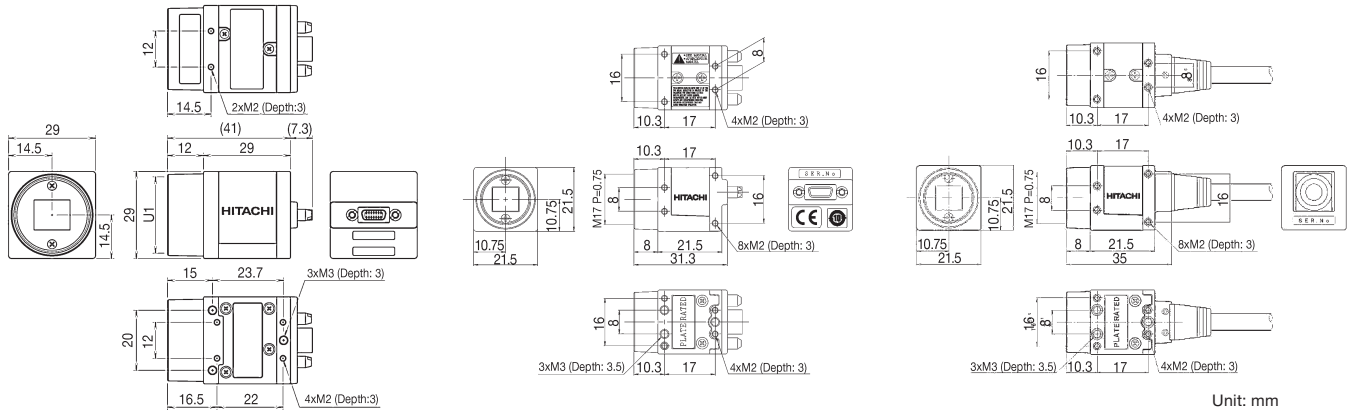
KP-F200 Lite	2.01 Megapixel	15 fps
KP-F80 Lite	0.81 Megapixel	36 fps
KP-F30 Lite	0.33 Megapixel	60 fps
KP-FM30 Lite	0.33 Megapixel	90 fps
KP-FBM30 Lite	0.33 Megapixel	90 fps

Main Specifications

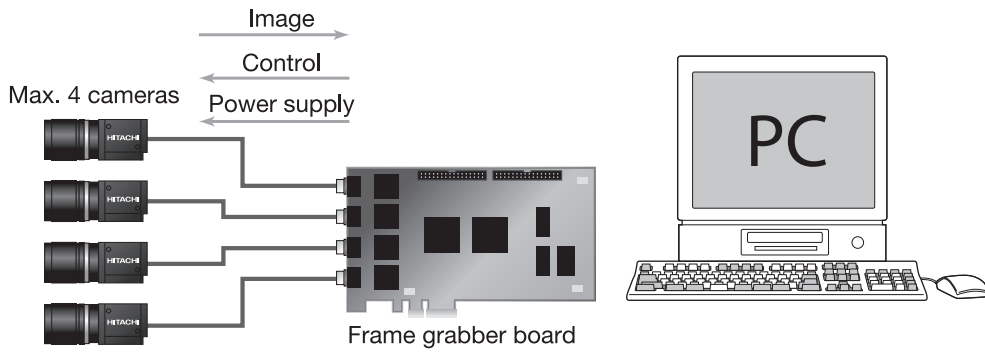
	KP-F200Lite	KP-F80Lite	KP-F30Lite	KP-FM30Lite / FBM30Lite												
Imaging device	1/1.8-inch interline CCD (ICX274AL)	1/3-inch interline CCD (ICX204AL)	1/3-inch interline CCD (ICX424AL)	1/3-inch CMOS												
Total pixels	1688 (H) x 1248 (V)	1077 (H) x 788 (V)	692 (H) x 504 (V)													
Effective pixels	1628 (H) x 1236 (V)	1034 (H) x 779 (V)	659 (H) x 494 (V)	752 (H) x 480 (V)												
Pixel size	4.4 μm (H) x 4.4 μm (V) (square lattice)	4.65 μm (H) x 4.65 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)	6.0 μm (H) x 6.0 μm (V) (square lattice)												
Sensing area	7.16 mm (H) x 5.44 mm (V)	4.76 mm (H) x 3.75 mm (V)	4.88 mm (H) x 3.66 mm (V)	4.51 mm (H) x 2.88 mm (V)												
Scanning system	Progressive															
Aspect ratio	4 : 3			5 : 3												
Frame rate	15 frames per second (full pixel readout)	36 frames per second (full pixel readout)	60 frames per second (full pixel readout)	90 frames per second (full pixel readout)												
Horizontal drive frequency	36.0000 MHz	36.0000 MHz	24.5454 MHz	36.818 MHz												
Horizontal scanning frequency	18.75 kHz (full pixel readout)	28.346 kHz (full pixel readout)	31.468 kHz (full pixel readout)	45.29 kHz (full pixel readout)												
Vertical scanning frequency	14.97 Hz (full pixel readout)	35.79 Hz (full pixel readout)	59.94 Hz (full pixel readout)													
Sync system	Internal															
Lens mount	C mount (Flange focal distance = 17.526 mm)			NF mount (Flange focal distance = 12 mm)												
Video output	Digital output (PoCL-Lite) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (PoCL-Lite) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	Digital output (PoCL-Lite) Base configuration: 24.5454 MHz (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (PoCL-Lite) Base configuration: 36.8184 MHz (Maximum cable length is 10 m) (KP-FBM30Lite: Cable length is 2 m) Output image size: 752 (H) x 480 (V) (full pixel readout)												
Resolution	Horizontal / Vertical: 1200 TV lines	Horizontal / Vertical: 800 TV lines	Horizontal: 500 TV lines / Vertical: 490 TV lines	Horizontal / Vertical: 480 TV lines												
Sensitivity	400 lx, F5.6, 3200 K	400 lx, F4, 3200 K	400 lx, F5.6, 3200 K	400 lx, F2.8, 3200 K												
Minimum illumination	1.0 lx (F1.4, MAX GAIN)			16 lx (F1.4, MAX GAIN)												
Signal noise to ratio	50 dB															
Electric shutter	OFF 1/15, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF 1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF 1/90, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)												
Gamma	γ = 1															
Frame on demand	(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode (C) VD reset mode			Fixed shutter (7 steps or variable)												
Partial scan	Selectable start position and height of picture grabbing in 1H step.			-												
Power supply voltage	12 ± 1 VDC															
Current consumption	Approx. 170 mA (Approx. 2.1 W)	Approx. 120 mA (Approx. 1.5 W)		Approx. 80 mA (Approx. 0.96 W)												
Ambient temperature	<table border="0"> <tr> <td>Performance</td> <td colspan="3">0 to +40 °C (+32 to +104 °F), less than 90 % RH</td> </tr> <tr> <td>Operation</td> <td colspan="3">-10 to +50 °C (+14 to 122 °F), less than 90 % RH</td> </tr> <tr> <td>Storage</td> <td colspan="3">-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)</td> </tr> </table>				Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH			Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH			Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH															
Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH															
Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)															
Vibration endurance	10 to 200 Hz 98 m/s ²															
Shock endurance	686 m/s ²															
External dimensions	29 (W) x 29 (W) x 29 (D) mm (Not including protrusions)			21.5 (W) x 21.5 (W) x 21.5 (D) mm (Not including protrusions) (Not including cable for KP-FBM30Lite)												
Mass	Approx. 50 g			Approx. 20 g (Not including cable for KP-FBM30Lite)												



Dimensions



System configuration



Standard composition

- Camera (with Dummy glass)
- Operation instructions

Optional accessories

- IR Cut Filter IRC650
- Tripod adaptor TA-F200S

IEEE1394.a 3CCD Color (RGB/YUV)

HV-F22F HV-F31F



Main Features

IEEE1394.a interface

- Direct PC connection without using a frame grabber board
- Small-diameter cable
- Multiple cameras connectable by use of hub
- Compatible OHCI, 400Mbps
- Non-compression
- Conforming with IIDC1.3

High resolution

The 1/2-inch/1.45 Mega pixels (HV-F31F: 1/3-inch/786k pixels) square lattice progressive scan CCD (R, G, B, 3CCD) and highly precise CCD positioning technology achieve high resolution of 1360(H) x 1024(V) (SXGA) (HV-F31F: 1024(H) x 768(V) (XGA)).

High precision digital Processing

The single chip 3 million gates 0.18 μm DSP design reduces the size, power consumption and greatly enhances stability. The 12 bit A/D converter and 14bit DSP processing provide a high S/N ratio and wide dynamic range.

High color fidelity and resolution

3 CCD (R, G, B) and prism system achieve high color fidelity and resolution.

6 color 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, micro-scope, etc) needing highly accurate color fidelity.

Adjustable sharpness (DTL) width

Sharpness (DTL) width is adjustable. A feeling of natural definition is provided when set a sharpness lower. A clear detail is provided when set it higher.

Auto shading (ASC)

Color shading (uneven color) due to lens and lighting can be automatically corrected.

Versatile CCD driving function

- External Trigger function
- Long time accumulate mode
- Variable shutter mode
- Automatic electric shutter mode (AES)

Improved operation ease

- Provides 4 application file
- Realtime automatic white balance function (ATW)
- Automatic Exposure (ALC)(Automatic level control) (Digital light measuring utilized a scene in to 64 divided sensing areas)
- Focus data output (serial data)
- 2 mode gain control(AGC function, 1 dB step programmable gain control)
- Contrast function
- Flare correction circuit
- Brightness (master black), R/B black, R/B gain adjustment function
- Color bar function
- Neg/pos switching function
- Rear LED indicator (Power on/off, communication state)

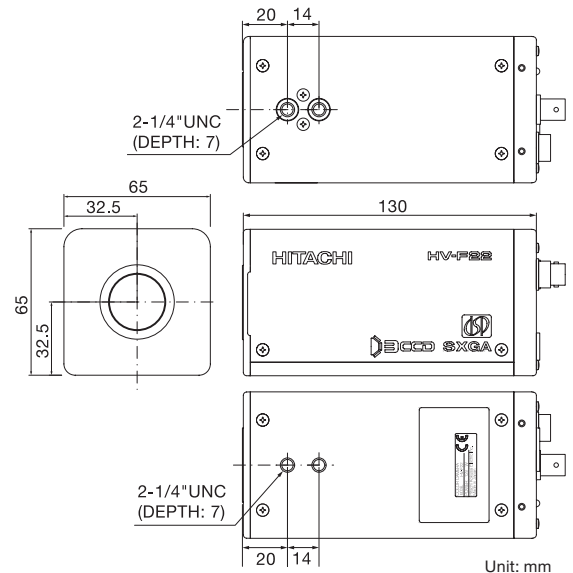
Easy to use GUI software

Various camera functions are available for adjustment through the easy to use GUI software which is included with the camera.

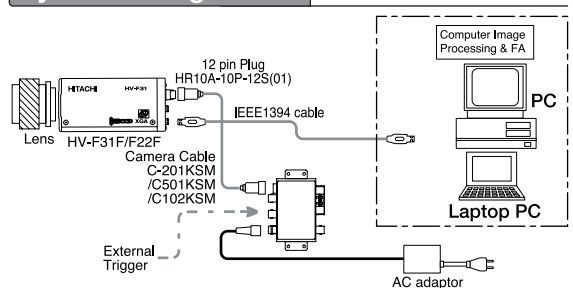
Main Specifications

		HV-F22F	HV-F31F
Imaging device	No. of effective pixels	1360(H) x 1024(V)	1024(H) x 768(V)
	Pixel size	4.65 μm(H) x 4.65 μm(V) (Square pixel)	
	Optical system	1/2-inch F1.6 prism	1/3-inch F2.2 prism
	Scanning area	6.32 mm(H) x 4.76 mm(V)	4.76 mm(H) x 3.53 mm(V)
Scanning system		Progressive	
Sync system		Internal / external (HD/VD automatically switch)	
Lens mount		C mount	
Flange focal distance		17.526 mm	
Video output	Interface	IEEE1394.a	
	Cable	IEEE1394.a 6 pin bus powered type	
	Transfer rate	400MHz	
	Image format	RGB 24/48 bit, YUV 16 bit	
	Image size	1360(H) x 1024(V), 1280(H) x 960(V), 640(H) x 480(V)	1024(H) x 768(V), 800(H) x 600(V)
Frame rate	7.5 frames per second (RGB 24 bit, 1360 x 1024)	7.5 frames per second (RGB 24 bit, 1024 x 768)	
	Sensitivity		2000 lx, F8 (at 1/30 second shutter)
Electric shutter speed	Auto(AES) / Variable / Accumulate mode		
	Variable	1/15 to 1/100,000 second	1/30 to 1/100,000 second
	AES	1/15 to 1/100,000 second	1/30 to 1/100,000 second
	Accumulate	1/15 to 4 second (1 frame step)	1/30 to 4 second (1 frame step)
External trigger shutter	Mode	Fixed shutter, One trigger	
	Input	12-pin connector (Hardware trigger)	
	Input level	Low: 0 V DC, High: 3 to 24 V DC	
External sync signal (Strobe out)		5 Vp-p ±0.3 V	
Screen distortion		All Screen: 0% (except lens characteristics)	
Registration		All Screen: 0.05% (except lens characteristics)	
Vertical Sharpness		2 H	
White balance		ATW / MANUAL / One-push	
Gain		AGC (0 to +12 dB) or 1dB step	
Gamma		0.45 / 1.0 (ON / OFF)	
Color masking		OFF/ON(6 color independent masking)	
Sharpness		Sharpness (DTL) level, Sharpness (DTL) width	
Color bar		Full	
Power supply		DC+12 V (10.5 V to 15 V DC without ripple)	
Power consumption		Approx. 8.0 W (DC+12 V)	
Ambient temperature	Operating	0 °C to +40 °C	
	Storage	-20 °C to +60 °C	
Vibration endurance		10 to 100 Hz 24.5 m/s ²	
Shock endurance		392 m/s ²	
External dimensions		65(W) x 65(H) x 130(D) mm (not including lens and protrusions)	
Mass		Approx. 600 g (without lens)	

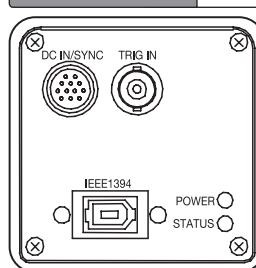
Dimensions



System configuration



Rear View



Standard composition

- Camera
- Lens mount sheet
- DC IN / SYNC connector plug (HR10A-10P-12S)
- CD-ROM (driver software)
- Instruction manual

Analog Interlaced 3CCD Color

HV-D30



HV-D20



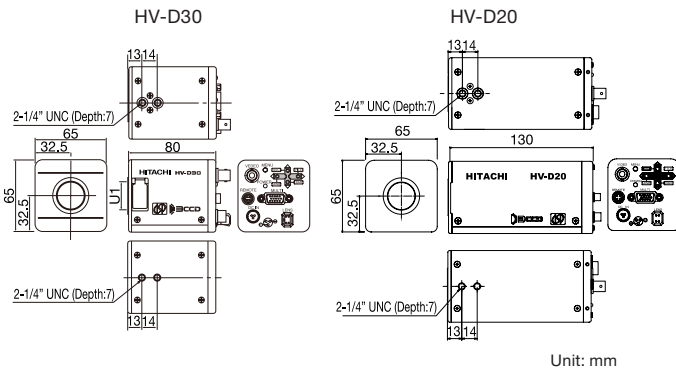
Main Features

- Compact, high Performance, multi purpose cameras featuring 12 bit A/D converters and a 3 million gate DSP
- High resolution of 800 TV lines
- Auto Shading Compensation (ASC)
- External Trigger functions

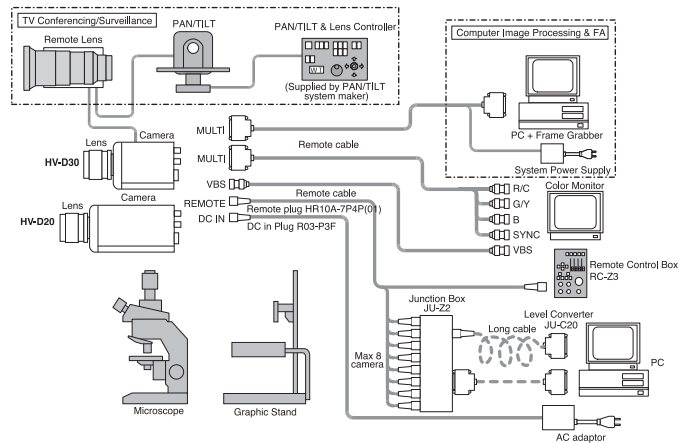
Main Specifications

	HV-D30	HV-D20
Color system	NTSC, PAL	PAL only
Optical system	1/3-inch, F2.2 prism	1/2-inch, F1.6 prism
Imaging device	1/3-inch interline CCD (R, G, B 3CCD)	1/2-inch interline CCD (R, G, B 3CCD)
Total pixels	NTSC 811(H) x 508(V) PAL : 795(H) x 596(V)	
Effective pixels	NTSC 768(H) x 494(V) PAL : 752(H) x 582(V)	
Sync system	Internal/external (VBS, BBS or HD/VD auto selection)	
Horizontal resolution	800TV lines, luminance signal center (Y out and DTL off)	
S/N	NTSC: 64dB (DNR: ON), PAL: 62dB (DNR: ON)	
Standard sensitivity	2000lx, F9.5	2000lx, F11
Minimum illumination	0.9 lx (50IRE, F2.2, GAIN: +24dB, DIGITAL GAIN: +12dB)	
Gamma correction	0.45/1.0 (ON/OFF)	
Lens mount	C mount (flange back 17.25mm in air)	
Sensitivity selection	AGC (0 to +24dB) or GAIN (0 to +24dB step 1dB or step 3dB on remote control menu)	
CCD drive functions	Preset	1/100(1/60 PAL), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/20000, 1/40000, 1/100000 second
	Lock scan	NTSC 1/60.38 to 1/2039 second (step 1H), to 1/100000 second (step approx. 10% video level) PAL 1/50.31 to 1/2024 second (step 1H), to 1/100000 second (step approx. 10% video level)
	Long time integration	Frame/field integration selection 1/30 (NTSC), 1/25 (PAL) to approx. 8 seconds (1 frame step)
Power supply voltage	12 V rated (stable operation at 10.5 to 15 VDC (ripple and noise absent))	
Power consumption	Approx. 4.5W	Approx. 5.0W
Dimensions	65(W)x65(H)x80(D)mm	65(W)x65(H)x130(D)mm
Mass	400g approx. (not including lens)	450g approx. (not including lens)
Ambient temperature	Operating -10 to +45°C Storage -20 to +60°C	

Dimensions



System configuration



Standard composition

- Camera
- Operation instructions
- Power plug (R03-P3F)

Optional accessories

- RGB cable (5m)
- Remote control box
- Junction box (max 8 camera)
- RGB cable (10m)
- Level converter
- C-501RR
- RC-Z3
- JU-Z2
- C-102RR
- JU-C20

Analog Interlaced 1CCD Color

KP-D20A KP-D20B KP-D20B-S3



Main Features

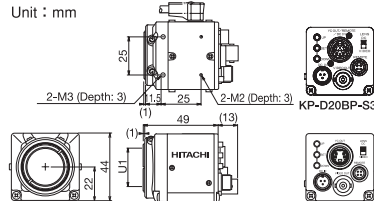
Compact multi purpose CCD color camera
Featuring high sensitivity and high image quality in a package measuring just 44(W) x 44(H) x 49(D) mm. An on-screen menu system allows optimum adjustment of camera parameters to meet the imaging application.

Main Specifications

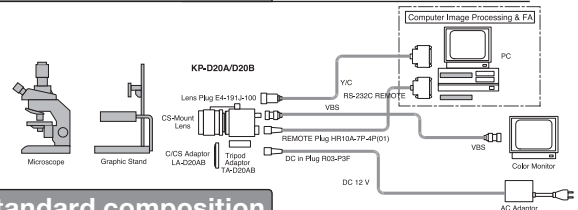
	KP-D20A	KP-D20B
Imaging device	1/3-inch interline CCD (NTSC: ICX408AK, PAL: ICX409AK)	1/2-inch interline CCD (NTSC: ICX418AKL, PAL: ICX419AKL)
Total pixels	NTSC: 811 (H) x 596 (V), PAL: 795 (H) x 596 (V)	
Effective pixels	NTSC: 768 (H) x 494 (V), PAL: 752 (H) x 582 (V)	
Pixel size	NTSC: 6.35 μm (H) x 7.4 μm (V), PAL: 6.5 μm (H) x 6.25 μm (V)	NTSC: 8.4 μm (H) x 9.8 μm (V), PAL: 8.6 μm (H) x 8.3 μm (V)
Color filter	RGB primary color mosaic filter	
Sensing area	NTSC: 4.88 mm (H) x 3.66 mm (V), PAL: 4.89 mm (H) x 3.64 mm (V)	NTSC: 6.45 mm (H) x 4.84 mm (V), PAL: 6.47 mm (H) x 4.83 mm (V)
Scanning frequency	NTSC: Horizontal: 15.734 kHz, Vertical: 59.94Hz PAL: Horizontal: 15.625 kHz, Vertical: 50 Hz	
Sync system	Internal	
Lens mount	C/CS-mount (C-mount adaptor optionally)	
Video output	VBS, Y/C	
Horizontal resolution	NTSC: 480TV Line, PAL: 470TV Line	
Minimum illumination	0.8 lx (F1.2, Max. gain) 0.3 lx (F1.2, Max. gain)	
Signal noise to ratio	50 dB or more	
Electric shutter	OFF(NTSC:1/60,PAL:1/50),1/100(PAL:1/120),1/25 0.1/500, 1/1000,1/2000,1/4000,1/10000,1/20000,1/30000 second, AES	
White balance	ATW / AWC / MANUAL	
Digital zoom	Enlarged 4 times smoothly	
Backlight compensation	Sensing areas selectable from 9 areas	
Power supply voltage	12 VDC ±10%	
Power consumption	Approx. 220mA	
Ambient	Operation: -10 to 50°C (+14 to +122°F), 30 to 80 % RH Storage: -20 to 60°C (-4 to +140°F), 20 to 90 % RH	
Vibration endurance	10 to 55Hz 1.96 to 59.3m/s ²	
External dimensions	44 (W) x 44 (H) x 49 (D) mm (Not including protrusions) KP-D20B-S6: 58 (W) x 44 (H) x 49 (D) mm	
Mass	Approx. 130 g KP-D20B-S6: 170 g	

KP-D20B-S3 : 12pin type, PAL type only

Dimensions



System configuration



Standard composition

- Camera
- Operation instructions

Optional accessories

- Tripod adaptor TA-D20AB
- C-mount adaptor LA-D20AB
- Remote plug HR10A-7P-4P(01)
- Lens plug E4-191J-100
- DC in plug R03-P3F
- Remote Y/C plug (D20BP-S3 only) HR10A-10R-12S(01)

Analog Interlaced EM-CCD Color

KP-DE500 (NTSC only)

Analog Interlaced EM-CCD Black & White

KP-E500 (EIA only)



Main Features

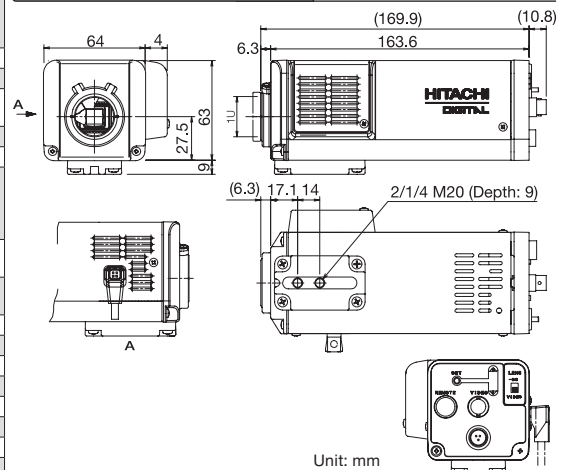
100 Times More Sensitive Than A Normal Camera (KP-DE500)
A new 1/2 inch EM-CCD with electron multiplication is used to achieve exceptional sensitivity. Color in full motion mode: 0.0009 lx Color accumulation mode: 0.000015 lx Monochrome in full motion mode: 0.00005 lx Monochrome accumulation mode: 0.0000008 lx

For Even Greater Sensitivity A Monochrome Version of the Camera is Available Allowing Use in Even Lower Light Levels (KP-E500)
In the normal mode of operation the camera provides higher sensitivity as compared to a normal camera. In the accumulation mode unmatched sensitivity is achieved allowing use in extremely low light situations. Monochrome in full motion mode: 0.00003 lx Monochrome accumulation mode: 0.0000005 lx

Main Specifications

	KP-DE500	KP-E500
Imaging device	1/2-inch interline EM-CCD (KP-DE500: TC246RGB, KP-E500: TC247SPD) Total pixels: 680(H) x 500(V) Effective pixels: 658(H) x 489(V) Imaging area: 6.58(H) x 4.89(V) mm Pixel size: 10.0(H) x 10.0(V) μm (Square pixel)	
Scanning frequency	Horizontal 15.734 kHz Vertical 59.94 Hz	
Synchronization	Internal	
Video output	Video: 0.7 Vp-p Plus terminal nature Sync: 0.3 Vp-p Negative polarity Burst: 0.3 Vp-p, More than 8 cycles Impedance: 75 Ω Un-balancing	
S/N	50 dB or more (luminosity signal, Gamma OFF, minimum gain, without detail boost)	
Resolution	Horizontal: 480 TV lines Vertical: 350 lines (In the central part)	
Minimum illumination	0.0009 lx (Color in full motion, max. gain, F1.2, 50 IRE) 0.00005 lx (B/W in full motion, max. gain, F1.2, 50 IRE) 0.000015 lx (Color 64 time accumulation, max. gain, F1.2, 50 IRE) 0.0000008 lx (B/W 64 time accumulation, max. gain, F1.2, 50 IRE)	
Sensitivity (Gain) setup	Auto or a manual (factory set-AUTO)	
Electric shutter	Shutter: 7 steps /AES (factory set-OFF) OFF(1/60), 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 sec	
Accumulation Mode	Auto or a fixed change is possible 2, 4, 6, 8, 10, 16, 32, 64 times	
Backlight compensation	ON/OFF change is possible Light-measurement area: Nine area to selection is possible.	
White balance control	ATW, AWC, MANUAL	
B/W Mode	OFF, ON, AUTO	
DNR	Change of AUTO / MANU (8 steps)	
Power supply voltage	DC 12V ±1 V	
Current consumption	Approximately 1.5 A (excluding lens load)	
Lens mount	The C / CS mount (flange back adjustment mechanism is attached)	
Ambient temperature	Operating: -10 °C to +50 °C / 30 to 80% RH Storage: -20 °C to +60 °C / 20 to 90% RH	
Vibration endurance	10 to 55Hz 1.96 to 59.3m/s ²	
External dimensions	78(W) x 63(H) x 170(D) mm	
Mass	Approx. 600 g	

Dimensions



Standard composition

- Camera
- Operation instructions
- DC plug

Analog Interlaced 1CCD Color

KP-D5000
KP-D5001



KP-D5010



Main Features

High Sensitivity

Ex view HAD CCD features 380,000 (440,000 for PAL) effective picture elements that deliver clear images even under low light condition.
Color in full motion mode: 0.03 lx Color accumulation mode: 0.002 lx
Monochrome in full motion mode: 0.004 lx Monochrome accumulation mode: 0.00003 lx

High Resolution

Realize high horizontal resolution (Color mode: 560 TV lines, B/W mode: 580 TV lines) by adopting new digital process technology.

High Sensitivity and low S/N ratio

New adaptive noise reduction can improve the S/N ratio without losing motion resolution.

Adaptive Image Enhancer

It is possible to observe it even if there is a luminance difference in the effect of Adaptive Image Enhancer of the black light control.

Adaptive Fog Reduction

The removal effect of the fog is obtained by the Adaptive Fog Reduction function.

Dial type back focus adjustment

An adjustable flange back mechanism is provided for optimum back focus of the lens.

KP-D5000: AC24V/DC12V power supply

KP-D5001: AC100 to 240V power supply

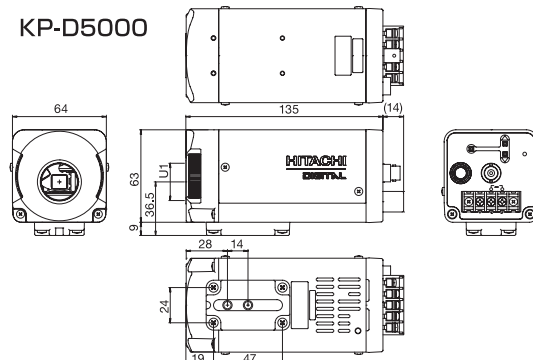
KP-D5010: DC12V power supply, Compact body

Main Specifications

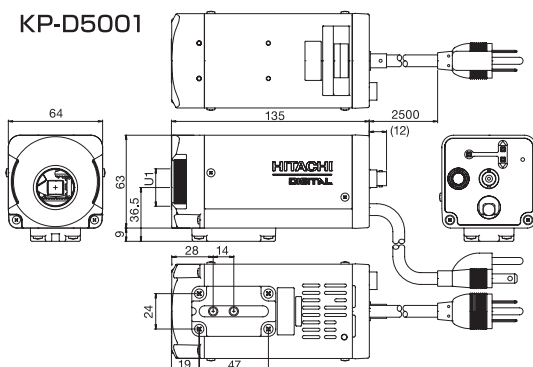
	KP-D5000	KP-D5001	KP-D5010	
Color system	NTSC or PAL			
Imaging device	1/2-inch interline CCD (NTSC: ICX428AKL, PAL: ICX429AKL)			
	Total pixels	NTSC: 811(H) x 508(V) PAL : 795(H) x 596(V)		
	Effective pixels	NTSC: 768(H) x 494(V) PAL : 752(H) x 582(V)		
	Sensing area	NTSC: 6.45(H) x 4.84(V) mm PAL : 6.47(H) x 4.83(V) mm		
Pixel size	NTSC: 8.4 μm (H) x 9.8 μm (V) PAL: 8.6 μm (H) x 8.3 μm (V)			
Scanning system	2:1 interlace			
Scanning frequency	NTSC Horizontal: 15.734 kHz, Vertical: 59.94Hz PAL Horizontal: 15.625 kHz, Vertical: 50 Hz			
Sync system	Internal/external (HD/VD)			
Video output	VBS	1.0 Vp-p		
	Video	0.7 Vp-p positive		
	Sync	0.3 Vp-p negative		
	Burst	0.3 Vp-p, more than 8 cycles		
Impedance	75 Ω unbalanced			
S/N	More than 53 dB (AGC: OFF(-6dB), enhancer and gamma off, DNR high)			
Resolution	Horizontal: 560 TV lines (color), 580 TV Lines (B/W) Vertical: 350 TV Lines (High resolution mode)			
Sense illumination range	0.0002 to 100,000 lx (F1.2, auto-iris lens)			
Minimum illumination	Color: 0.03 lx (F1.2, 3200K, AGC maximum) B/W: 0.004 lx (F1.2, 3200K, AGC maximum, tungsten lamp)			
AGC	On/off selectable Off (manual: 0 to 51 dB), On (max. gain: -6 to 51 dB)			
Electric shutter	(NTSC: 1/60, PAL: 1/50), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000, 1/50,000, 1/100,000 second and auto			
Integration multiple setting	Automatic or manual (fixed) Automatic: max. 128 times Manual: max. 512 times			
Back light control	On/Off switchable Sensing areas: selectable 9 areas Adaptive image enhancer: Off (mode off), On (automatic back light control)			
Auto-iris lens output	Switchable video signal input type or iris control voltage input (galvanometer) type			
White balance	Selectable auto-tracking (ATW), preset (AWC), manual (R/B gain adjustment)			
Text display	One line of up to 24 alphanumeric characters			
Digital zoom	Up to 4 times (resolution loss with magnifications)			
B/W Mode	OFF: color always mode ON: B/W always mode AUTO: mode selected in response to brightness (can be set for high, medium or low)			
Nose reduction	Selectable On/Off/High/Low High: adaptive noise reduction (S/N ratio priority mode), Low: adaptive noise reduction (motion resolution priority mode)			
Adaptive fog reduction	Off: fog reduction mode off On: adjust foggy picture automatically Manual: adjust foggy picture manually			
Scene file	It is possible to memorize five camera settings (changeable by remote control)			
Power supply voltage	AC24V ±10%, 50/60Hz DC12V ±10%	AC100 to 230V ±10%, 50/60Hz	DC12V ±10%	
Power consumption	4.0 W or less		2.3 W or less	
Lens mount	C/CS mount (with dial type back focus adjustment)			
Ambient temperature	Operating	-10 to +50 °C / 30 to 80% RH		
	Storage	-20 to +60 °C / 20 to 90% RH		
Vibration endurance	10 to 55Hz 1.96 to 59.3m/s ²			
Dimensions	64(W) x 63(H) x 135(D) mm (not including lens and protrusions)		64(W) x 63(H) x 64(D) mm (not including lens and protrusions)	
Mass	Approx. 600g		Approx. 270g	

Dimensions

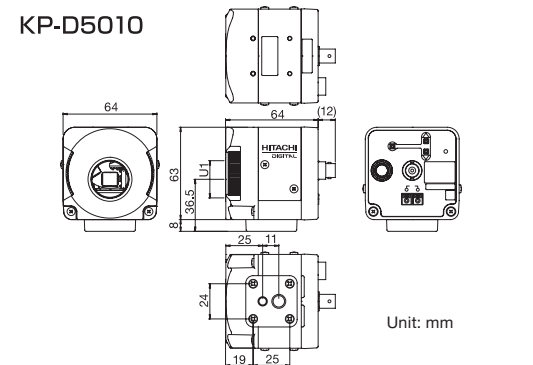
KP-D5000



KP-D5001



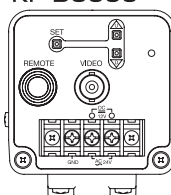
KP-D5010



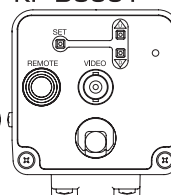
Unit: mm

Rear View

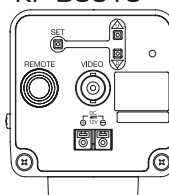
KP-D5000



KP-D5001



KP-D5010



- Camera (with tripod adaptor)
- Operation instructions

Optional accessories

- Lens plug E4-191J-100
- Remote plug HR10A-10P-12P(1)

Analog Interlaced 1CCD Black & White

**KP-M30
KP-M20**



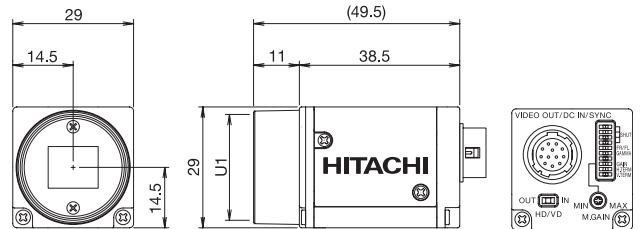
Main Features

- Compact body 29 (W) X 29 (H) X 38.5 (D) mm
- High resolution & high sensitivity 570 TV Line (horizontal), 0.3 lx (F1.4)

Main Specifications

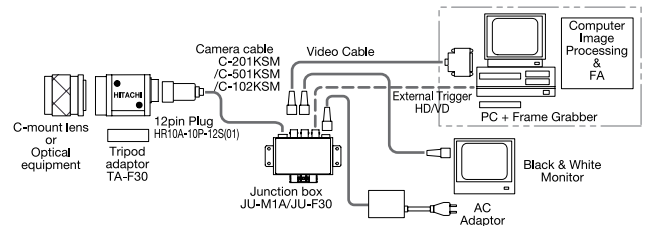
		KP-M30	KP-M20
Imaging device	Total pixels	1/3-inch interline CCD (EIA: ICX408AL, CCIR: ICX409AL)	1/2-inch interline CCD (EIA: ICX418ALL, ICX419ALL)
	Effective pixels	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)	EIA: 768 (H) x 494 (V) CCIR: 752 (H) x 582 (V)
	Pixel size	EIA: 6.35 μm (H) x 7.4 μm (V) CCIR: 6.5 μm (H) x 6.25 μm (V)	EIA: 8.4 μm (H) x 9.8 μm (V) CCIR: 8.6 μm (H) x 8.3 μm (V)
Sensing area		EIA: 4.88 mm (H) x 3.66 mm (V) CCIR: 4.89 mm (H) x 3.64 mm (V)	EIA: 6.45 mm (H) x 4.84 mm (V) CCIR: 6.47 mm (H) x 4.83 mm (V)
Scanning frequency		Horizontal; EIA:15.734KHz, CCIR:15.625KHz Vertical; EIA: 59.94Hz, CCIR: 50Hz	
Sync system		Internal/external (auto selection)	
Lens mount		C mount (Flange focal distance=17.526 mm)	
Video output		1.0Vp-p 75Ω Un-balanced Video: 0.7Vp-p sync : 0.3Vp-p negative	
Horizontal resolution		EIA:570TV Line CCIR: 560TV Line	
Sensitivity		200 lx (F4, Max. gain, 3200K)	
Minimum illumination		0.3 lx (F1.4, AGC, Gamma ON)	
Signal noise to ratio		60 dB (Min. gain)	
External sync input		Switchable by external switch Input; HD/VD 4 to 6V DC negative, frequency deviation: ±1%, Impedance: 75Ω or high impedance Output; HD/VD 5V DC negative, Impedance: 100Ω	
Electric shutter		1/50 (CCIR), 1/60 (EIA), 1/100 (CCIR), 1/120 (EIA), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 second. OFF is normal exposure	
Gamma		γ = 1 or adjustable	
Accumulate mode		Filed of flame accumulate	
Power supply voltage		12 ± 1 VDC	
Power consumption		Approx. 1.4 W	
Ambient	Operation	-10 to 50°C (+14 to +122°F), less than 90 % RH	
	Storage	-20 to 60°C (-4 to +140°F), less than 70 % RH	
Vibration endurance		10 to 200 Hz 98 m/s ²	
Shock endurance		686 m/s ²	
External dimensions		29 (W) x 29 (H) x 38.5 (D) mm (Not including protrusions)	
Mass		Approx. 55 g	

Dimensions



Unit : mm

System configuration



Standard composition

- Camera
- Operation instructions

Optional accessories

- 12 pin plug HR10A-10P-12S(01)
- Junction box JU-M1A/JU-F30
- Dummy glass (AR coated) ARC1214
- Camera cable (Molded type) 2m C-201KSM
5m C-501KSM
10m C-102KSM
- Tripod adaptor TA-F30

Analog Interlaced 1CCD Black & White

**KP-M1A
KP-M2A
KP-M3A
KP-M2R-S3**



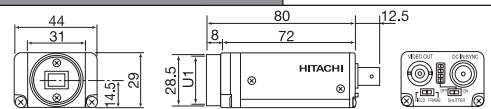
Main Features

- High sensitivity, high resolution and high performance
- Line up 2/3, 1/2, 1/3 inch CCD models
- Near infrared sensitivity (KP-M2R)

Main Specifications

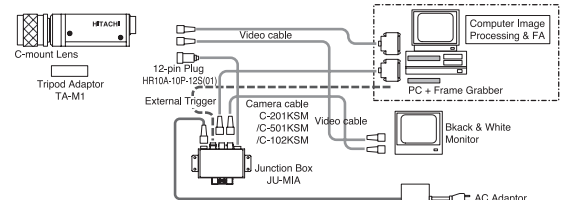
		KP-M1A	KP-M2A/M2R-S3	KP-M3A
Imaging device	Total pixels	2/3-inch interline CCD (EIA: ICX422A, CCIR: ICX423AL)	1/2-inch interline CCD M2A (EIA: ICX418ALL, CCIR: ICX419ALL) M2R (EIA: ICX428ALL, CCIR: ICX429ALL)	1/3-inch interline CCD (EIA: ICX408AL, CCIR: ICX409AL)
	Effective pixels	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)	EIA: 768 (H) x 494 (V) CCIR: 752 (H) x 582 (V)	EIA: 768 (H) x 494 (V) CCIR: 752 (H) x 582 (V)
	Pixel size	EIA: 11.6 μm (H) x 13.5 μm (V) CCIR: 11.6 μm (H) x 11.2 μm (V)	EIA: 8.4 μm (H) x 9.8 μm (V) CCIR: 8.6 μm (H) x 8.3 μm (V)	EIA: 6.35 μm (H) x 7.4 μm (V) CCIR: 6.5 μm (H) x 6.25 μm (V)
Sensing area		EIA: 8.91 mm (H) x 6.67 mm (V) CCIR: 8.72 mm (H) x 6.52 mm (V)	EIA: 6.45 mm (H) x 4.84 mm (V) CCIR: 6.47 mm (H) x 4.83 mm (V)	EIA: 4.88 mm (H) x 3.66 mm (V) CCIR: 4.89 mm (H) x 3.64 mm (V)
Scanning frequency		Horizontal; EIA:15.734KHz, CCIR:15.625KHz Vertical; EIA: 59.94Hz, CCIR: 50Hz		
Sync system		Internal/external (auto selection)		
Lens mount		C mount (Flange focal distance=17.526 mm)		
Video output		1.0Vp-p 75Ω Un-balanced Video: 0.7Vp-p sync : 0.3Vp-p negative		
Horizontal resolution		EIA: 570TV Line CCIR: 560TV Line		
Sensitivity		400 lx (F8, Max. gain, 3200K)		
Minimum illumination		0.3 lx (F1.4, AGC, Gamma ON, without IR cut filter)		
Signal noise to ratio		56 dB		
External sync input		Input; HD/VD 2 to 6V DC negative, frequency deviation: ±1%, Impedance: 75Ω or high impedance		
Electric shutter		1/100 (EIA), 1/120 (CCIR), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, second. OFF is normal exposure		
Gamma		γ = 1 or adjustable		
Accumulate mode		Filed of flame accumulate		
Power supply voltage		12 ± 1 VDC		
Power consumption		Approx. 1.4 W		
Ambient	Operation	-10 to 50°C (+14 to +122°F), less than 90 % RH		
	Storage	-20 to 60°C (-4 to +140°F), less than 70 % RH		
Vibration endurance		10 to 200 Hz 98 m/s ²		
Shock endurance		686 m/s ²		
External dimensions		44 (W) x 29 (H) x 72 (D) mm		
Mass		Approx. 55 g		

Dimensions



Unit: mm

System configuration



Standard composition

- Camera
- Operation instructions

Optional accessories

- 12 pin plug HR10A-10P-12S(01)
- Junction box JU-M1A
- Dummy glass (AR coated) ARC1214
- Camera cable (Molded type) 2m C-201KSM
5m C-501KSM
10m C-102KSM
- Tripod adaptor TA-M1

Analog Progressive 1CCD Color

KP-FD30
KP-FD30M



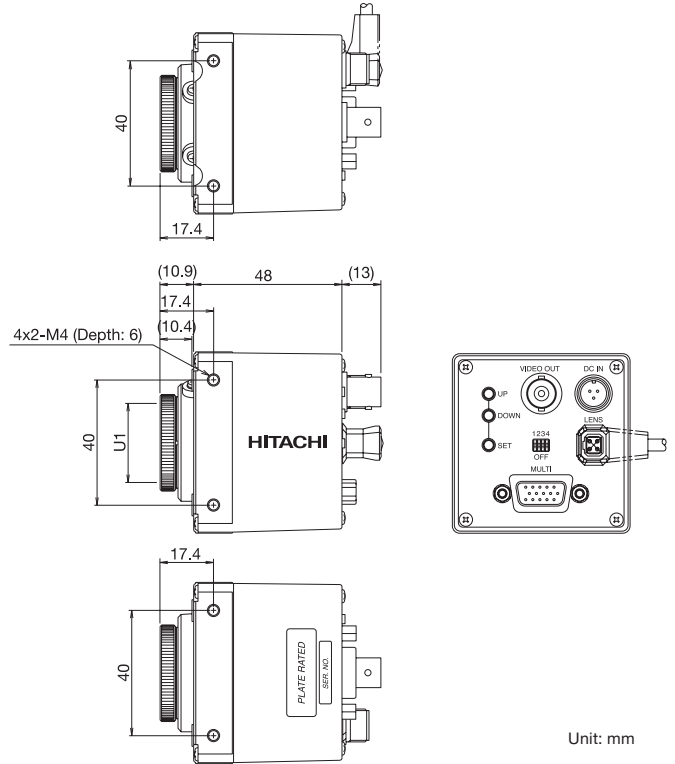
Main Features

- High resolution and high color fidelity
By adoption of the progressive scan CCD image sensor and RGB primary color mosaic filters, the picture of high vertical resolution and high color fidelity can be acquired.
- Suitable for the image-processing equipment input
Small lightweight size, RGB output and various image processing function.
- NTSC output (only KP-FD30)
- The still picture continuation output (only KP-FD30M)

Main Specifications

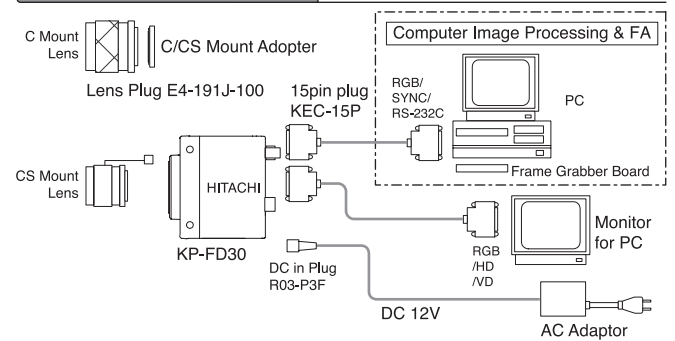
		KP-FD30 / FD30M
Imaging device		1/2-inch interline CCD (ICX414AQ)
	Total pixels	692 (H) x 504 (V)
	Effective pixels	659 (H) x 494 (V)
	Pixel size	9.9 μm (H) x 9.9 μm (V)
	Color filter	RGB primary color mosaic filter
Sensing area		6.52 mm (H) x 4.89 mm (V)
Scanning system		Progressive scan (VGA mode) (Switch change) 2:1 interlace (NTSC mode, KP-FD30 only)
Scanning frequency		Horizontal: 31.468KHz Vertical: 59.94Hz
Sync system		Internal/external (auto selection)
Lens mount		C mount (Flange back: adjustable)
Video output		RGB (G on SYNC), Y/C (only NTSC mode), VBS (only NTSC mode)
Resolution		Horizontal : 440TV lines Vertical : 480TV lines (VGA mode) 350TV lined (NTSC mode)
Sensitivity		2000 lx (F5.6, 100 IRE)
Minimum illumination		10 lx (F1.4, Max. gain, 50 IRE)
Signal noise to ratio		50 dB or more
External sync input		Input: HD/VD 2Vp-p Trigger: VGA mode only, low: 0V, high: 2 to 5V
Electric shutter	Preset	High speed: OFF(1/60), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/20000, 1/30000, 1/50000 second Low speed: OFF(1/60), 1/15, 1/10, 1/7.5, 1/6, 1/5, 1/3.75, 1/3, 1/2.5, 1/1.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.5, 7.0, 7.5, 8.0 second
	AES	1/60 to approx. 1/50,000 second (Response : SLOW NORMAL FAST)
	VARIABLE	1H steps from 1/60 to 1/10,000 second
Power supply voltage		12 VDC ±10%
Power consumption		KP-FD30: Approx. 360mA KP-FD30M: Approx. 370mA
Ambient	Operation	-10 to 50°C (+14 to +122°F), 30 to 80 % RH
	Storage	-20 to 60°C (-4 to +140°F), 20 to 90 % RH
Vibration endurance		10 to 200 Hz 68.65 m/s ²
Shock endurance		490 m/s ²
External dimensions		58 (W) x 58 (H) x 48 (D) mm (Not including protrusions)
Mass		Approx. 220 g

Dimensions



Unit: mm

System configuration



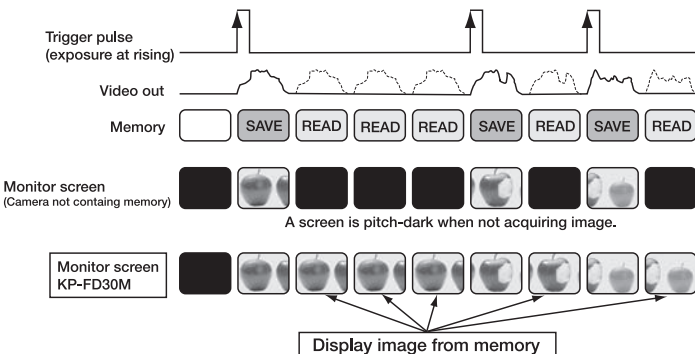
Standard composition

- Camera
- Operation instructions

Optional accessories

- C-mount adaptor LA-D20AB
- Lens plug 4 pin JEITA E4-191J-100
- DC in plug R03-P3F
- RGB cable (5m) C-501RR
- RGB cable (10m) C-102RR

The still picture continuation output (KP-FD30M)



Analog Progressive 1CCD Black & White

KP-F80
KP-F33
KP-F30



Main Features

Compact body

29 (W) X 29 (H) X 38.5 (D) mm

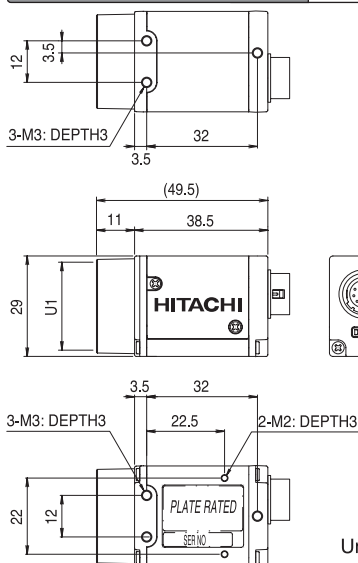
High resolution & high frame rate

KP-F30: VGA (Effective: 659(H)x494(V)), 60 fps
 KP-F33: VGA (Effective: 659(H)x494(V)), 30 fps
 KP-F80: XGA (Effective: 1034(H) x 779(V)), 30 fps

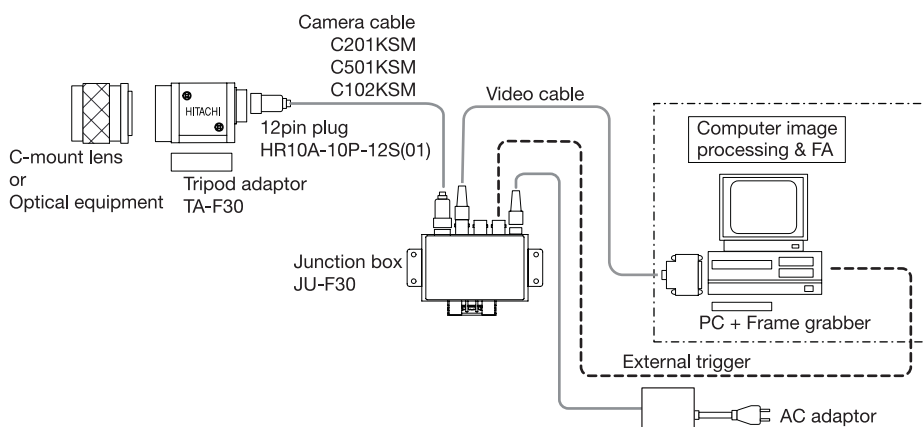
Main Specifications

		KP-F80	KP-F33	KP-F30
Imaging device	Total pixels	1/3-inch interline CCD (ICX204AL) 1077 (H) x 788 (V)	1/3-inch interline CCD (ICX424AL) 692 (H) x 504 (V)	
	Effective pixels	1034 (H) x 779 (V)	659 (H) x 494 (V)	
	Pixel size	4.65 μm (H) x 4.65 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)	
Sensing area	4.81 mm (H) x 3.62 mm (V)			
Aspect ratio	4 : 3			
Frame rate	30 frames per second		30 frames per second	60 frames per second
Horizontal scanning frequency	23.622 kHz		15.734 kHz	31.468 kHz
Vertical scanning frequency	29.83 Hz		29.97 Hz	59.94 Hz
Sync system	Internal/external (auto selection)			
Lens mount	C mount (Flange focal distance=17.526 mm)			
Video output	1.0Vp-p 75Ω Un-balances Video: 0.7Vp-p Sync : 0.3Vp-p negative			
Horizontal resolution	800 TV Line		500 TV Line	
Sensitivity	400 lx (F4, with IR cut filter, 3200K)		400 lx (F8, with IR cut filter, 3200K)	400 lx (F5.6, with IR cut filter, 3200K)
Minimum illumination	1.0 lx (F1.4, Max. gain, without IR cut filter)		0.5 lx (F1.4, Max. gain, without IR cut filter)	0.7 lx (F1.4, Max. gain, without IR cut filter)
Signal noise to ratio	54 dB		50 dB	
External sync input	Switchable by external switch Input; HD/VD 4 to 6V DC negative, frequency deviation: ±1%, Impedance: 75Ω or high impedance Output; HD/VD 5V DC negative, Impedance: 100Ω			
Electric shutter	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate)		1/125, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/25000 second. OFF is normal exposure (frame rate.)	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate)
Gamma	γ = 1			
Frame on demand	(A) Fixed shutter (B) ONE trigger mode (C) Reset control mode (D) Partial scan mode (option)			
Power supply voltage	12 ± 1 VDC			
Power consumption	Approx. 2.2 W		Approx. 1.8 W	Approx. 2.1 W
Ambient	Operation	-10 to 50°C (+14 to +122°F) , less than 90 % RH		
	Storage	-20 to 60°C (-4 to +140°F) , less than 70 % RH		
Vibration endurance	10 to 200 Hz 98 m/s ²			
Shock endurance	686 m/s ²			
External dimensions	29 (W) x 29 (H) x 38.5 (D) mm (Not including protrusions)			
Mass	Approx. 55 g			

Dimensions



System configuration



Optional accessories

- 12 pin plug HR10A-10P-12S(01)
- Junction box JU-F30
- Dummy glass (AR coated) ARC1214
- Camera cable (Molded type) 2m C-201KSM
5m C-501KSM
10m C-102KSM
- Tripod adaptor TA-F30

Standard composition

- Camera
- Operation instructions

Accessory list

Interface		GigE Vision	Mini Camera Link										PoCL-Lite	Camera Link	IEEE 1394a	Analog	HD	
			SCL Type					WCL Type			PCL Type							
Model Name		HV-F202GV	KP-F500GV / F202GV / F145GV KP-F140GV / F83GV / F33GV KP-FD500GV / FD202GV KP-FD140GV / FD83GV / FD33GV	HV-F22GV	HV-F202SCL	KP-F500SCL / FR500SCL KP-FD500SCL / FD202SCL / FD140SCL	KP-F230SCL / FR230SCL KP-F31SCL / FR31SCL	KP-F200SCL / FR200SCL / F80SCL FR80SCL / F30SCL / FR30SCL	KP-FB30SCL / FBR30SCL	KP-F500WCL / FR500WCL KP-FM400WCL/FMR400WCL KP-FM200WCL/FMR200WCL	KP-F145WCL	KP-FD500PCL / KP-FD202PCL / FD140PCL KP-F230PCL / FR230PCL KP-F31PCL / FR31PCL	KP-F200PCL / FR200PCL / F80PCL FR80PCL / F30PCL / FR30PCL	KP-FB30PCL / FBR30PCL	KP-F200Lite/F80Lite/F30Lite KP-FM30Lite KP-FBM30Lite	KP-F120CL KP-FD30CL HV-F22CL / F22CL-S1 HV-F31CL / F31CL-S1 HV-F22F / F31F	KP-F80 / F33 / F30 KP-M30 / M20 KP-M1A / M2A / M3A / M2R-S3 KP-FD30 / FD30M KP-D20A / D20B / D20B-S3	KP-HD20A HV-HD33
Junction Box	JU-M1A																	
	JU-F1																	
	JU-Z2																	
	JU-F30	○		○	○													
Multi Unit	MU-HD101																	
Remote Control Box	RC-Z3																	
C/CS-mount Adaptor	LA-D20AB																	
Tripod Adaptor	TA-120														○			
	TA-D20AB																	
	TA-F500				○				○		○	○						
	TA-F230					○						○						
	TA-F202	○		○														
	TA-F200S						○					○						
	TA-FM200								○									
	TA-F30																	
	TA-FB30/FB30P								○							○	○	
	TA-FM30Lite													○	○			
TA-FD140																		
TA-M1	○															○		
Mini Camera Link Cable SDR-MDR	(1m)	C-101SCL		○	○	○	○	○	○	○	○(*9)	○						
	(2m)	C-201SCL		○	○	○	○	○	○	○	○(*9)	○						
	(3m)	C-301SCL		○	○	○	○	○	○	○	○(*9)	○						
	(5m)	C-501SCL		○	○	○	○	○	○	○	○(*9)	○						
	(10m)	C-102SCL				(*2)	○	○	○		○							
	(10m)	C-102SCL (HF)		○	○	○	○	○	○	○								
PoCL Cable SDR-SDR	(1m)	C-101PCL (SS)								○	○(*9)	○	○	○	○	○		
	(2m)	C-201PCL (SS)								○	○(*9)	○	○	○	○	○		
	(3m)	C-301PCL (SS)								○	○(*9)	○	○	○	○	○		
	(5m)	C-501PCL (SS)								○	○(*9)	○	○	○	○	○		
	(10m)	C-102PCL (SS)										○(*3)	○	○	○	○		
PoCL Cable SDR-MDR	(1m)	C-101PCL (SM)								○	○(*9)	○	○	○	○	○		
	(2m)	C-201PCL (SM)								○	○(*9)	○	○	○	○	○		
	(3m)	C-301PCL (SM)								○	○(*9)	○	○	○	○	○		
	(5m)	C-501PCL (SM)								○	○(*9)	○	○	○	○	○		
	(10m)	C-102PCL (SM)										○(*3)	○	○	○	○		
Camera Link Cable	(2m)	C-201CL												○	○	○		
	(3m)	C-301CL												○	○	○		
	(5m)	C-501CL												○	○	○		
	(10m)	C-102CL												○	○	○		
Camera Cable	(2m)	C-201KSM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	(5m)	C-501KSM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	(10m)	C-102KSM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	(3m)	C-301KAJ																
	(10m)	C-102KAJ																
	(20m)	C-202KAJ																
RGB Cable	C-501RR																○	
	C-102RR																○	
15 pin Plug	KEC-15P																○	
12 Pin Plug	HR10A-10P-12S	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
6pin Plug	HR10A-7P-6P																○	
4pin Plug	HR10A-7P-4P																○	
Lens Plug	E4-191J-100																○	
DC Plug	R03-P3F																○	
Dummy Glass	ARC1214	○(*4)			○(*4)	○			○(*4)		○(*4)	○		○		○	○	
	ARC1616										○(*7)							
IR Cut Filter	IRC650	○(*5)	○(*6)		○(*5)	○(*6)			○(*5)		○(*5)	○(*6)		○(*6)		○(*6)		
	IRC1616										○(*8)							

(*1) : JU-F30 can be used only to input or output Trigger signal etc. Power cannot be supplied.

(*2) : Available for only KP-FD140SCL.

(*3) : Available for only KP-FD140PCL.

(*4) : ARC1214 is equipped in the F-type camera.

(*5) : IRC650 is equipped in the FD/FR-type camera.

(*6) : IRC650 is equipped in the camera.

(*7) : ARC1616 is equipped in the FM-type camera.

(*8) : IRC1616 is equipped in the FMR-type camera.

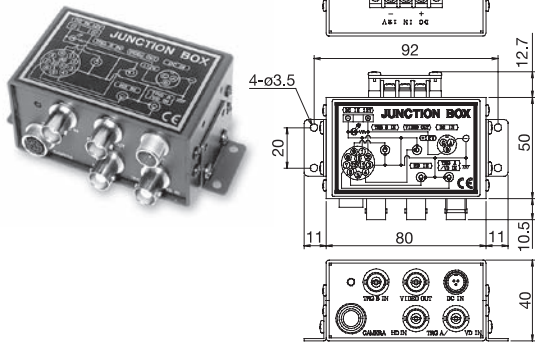
(*9) : When using KP-FMR400WCL/FM400WCL/FMR200WCL/FM200WCL in Full Configuration mode, please use the dedicated cable for Full Configuration.

Accessories

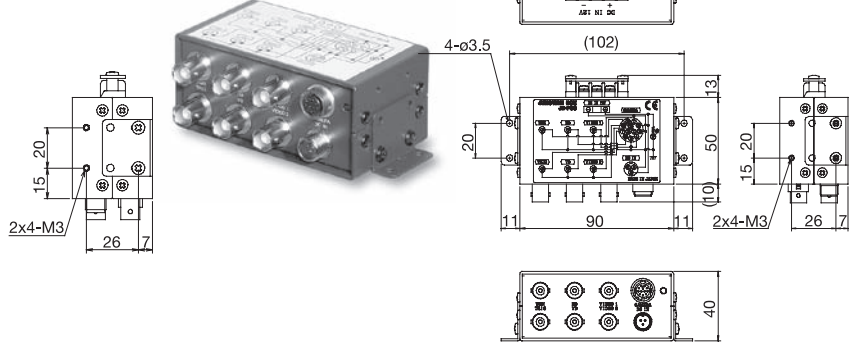
Junction Box

Junction box is used for supplying power or synchronization signal to a camera.

JU-M1A



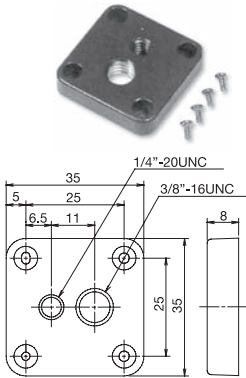
JU-F30



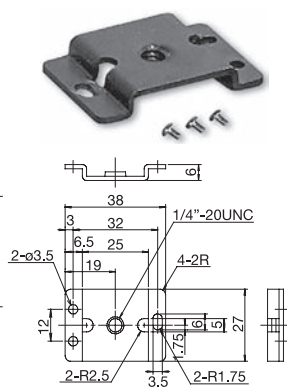
Tripod Adaptor

Tripod adaptors allow the cameras to be mounted to a tripod.

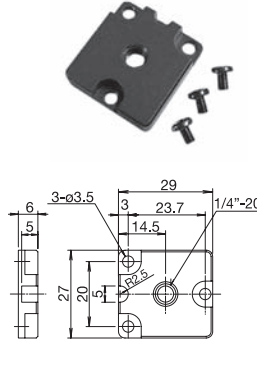
TA-M1



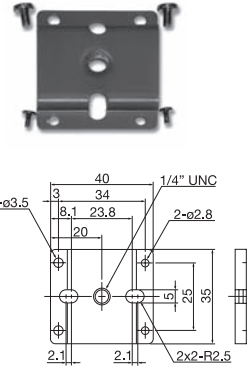
TA-F30



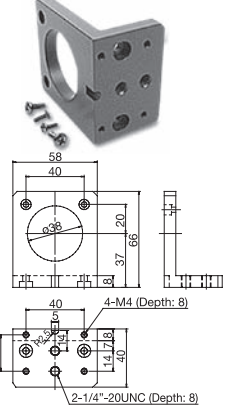
TA-F200S



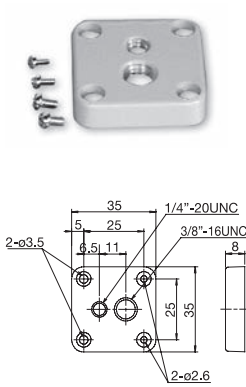
TA-FD140



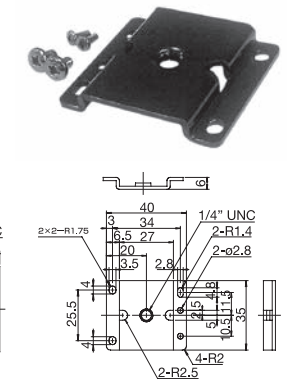
TA-F120



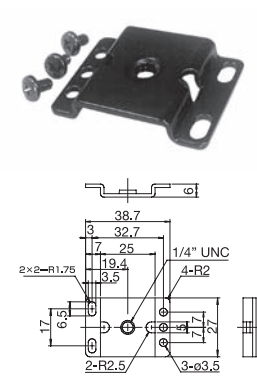
TA-D20AB



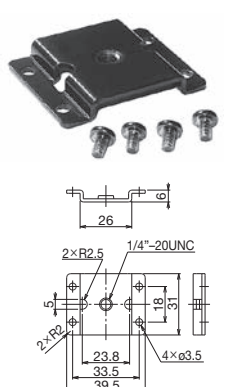
TA-F500



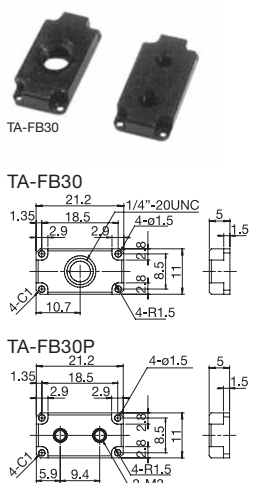
TA-F230



TA-FM200



TA-FB30 / FB30P



Camera Cable

C-201/501/102KSM



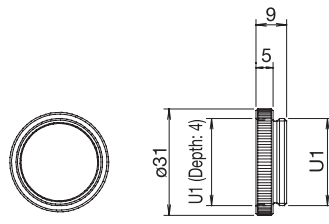
The camera cable is used for connecting camera and junction box. Supply 12VDC or external trigger signal to camera.

Molded type

- C-201KSM2m
- C-501KSM5m
- C-102KSM 10m

C/CS Adaptor

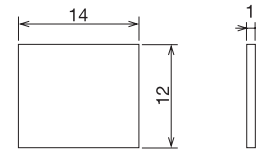
LA-D20AB



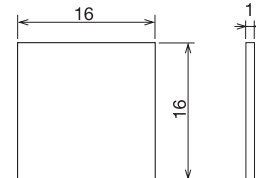
C to CS mount adaptor. 5mm adapter ring used when C mount lenses are used on a CS mount camera.

Dummy Glass

ARC1214



ARC1616



Dummy glass is attached instead of IR-cut filter when acquiring near infrared range.

List of Frame Grabber Board

Board Maker	Model	Interface	Mini Camera Link																	
			SCL											PCL		WCL				
			3CCD	Color			SCL								Color		B/W, RAW			
Cognex (USA)	MVS-8601	CL																		
	MVS-8504	Analog																		
Coreco(CANADA)/ ADSTEC/CTC	PC2-CAMLINK	CL																		
	X64-CL iPro / express	CL(Base)																		
	X64-Xelera-CL SE	CL(Base/Med/Full)																		
	X64-Xelera-CL Dual	CL(Base/Med)																		
	X64-Xelera-CL Full	CL(Base/Med/Full)																		
Epix (USA)	X64-AN	Analog																		
	PIXCI SV5	Analog																		
	PIXCI-CL1	CL																		
	PIXCI-CL2	CL																		
	PIXCI-EL1	CL																		
	PIXCI-EL1DB	CL																		
	PIXCI-EB1	CL																		
	PIXCI-EB1(PoCL)	CL																		
	PIXCI-E4	CL																		
	PIXCI-E4DB	CL																		
Euresys (BELGIUM)	PIXCI-ECB1	CL																		
	PIXCI-EC1	CL																		
Euresys (BELGIUM)	GrabLink	CL																		
	DOMINO Series	Analog																		
MATRIX VISION (GERMANY)	mvGAMMA-CL	CL(Base)																		
	mvGAMMA-G	Analog (B/W)																		
	mvTITAN-CL	CL(Base/Mid)																		
	mvTITAN-G1	Analog (B/W)																		
	mvTITAN-RGB/G4	Analog (RGB)																		
	mvTITAN-C8/C16	Analog (TV)																		
	mvHYPERION-CL	CL																		
	mvHYPERION-CLe	CL																		
	mvHYPERION-CL m/f	CL																		
	mvDELTA	Analog																		
Matrox (CANADA)	mvSIGMA	Analog																		
	Odyssey XCL	CL																		
	Odyssey Xpro	CL																		
	Helios-XA	Analog																		
	Helios-XCL	CL																		
	Helios-eCL/XCL	CL(64MZ)																		
	Solios XA	Analog																		
	Solios XCL (6MCL/FC)	CL(66/85MHz)(Base, Mid)																		
	Solios eVCL	CL(85MZ) (Base)																		
	Solios eVCL (F)	CL(85MZ) (Mid, Full)																		
National Instruments (USA)	METEOR II -MC	Analog																		
	METEOR II -Digital	LVDS																		
	METEOR II -CL	CL																		
	PCI-1424	CL																		
	PCI/PXI-1428	CL																		
	PCI-1426	CL																		
AVALDATA (JAPAN)	PCIe-1427	CL																		
	PCIe-1430	CL																		
	PCIe-1429	CL																		
	APC-3310CL	CL(Base)																		
	APX-3316	CL(Full)																		
	APX-3312A	CL(Base)																		
GRAPHIN (JAPAN)	APX-3313A	CL(Full)																		
	APX-3318	CL(Full)																		
	APX-3311	PoCL-Lite																		
	IPM-8580CL-M	CL(Medium)																		
	IPM-8580CL-F	CL(Full)																		
	IPM-8580CL-M(PoCL)	CL(Medium)																		
	IPM-8531CL-BE	CL(Base)																		
	IPM-8531CL-BE(PoCL)	CL(Base)																		
	IPM-8531CL-M	CL(Meium)																		
	MICRO-TECHNICA (JAPAN)	IPM-8531CL-F	CL(Full)																	
IPM-5512		CL(Base)																		
IPM-5512-PCL (PoCL)		CL(Base)																		
IPM-5512-Lite		PoCL-Lite																		
IPM-5514-Lite		PoCL-Lite																		
MTPCI-DC2		Analog(Color)																		
MTPCI-TL2		CL(Base)																		
MTPCI-PL-G		CL(Base)																		
Linx (JAPAN)	MTPCI-QL-G	PoCL-Lite																		
	GINGA digital-CL2	CL(Base/Mid)																		
Renesas Northern Japan Semiconductor (JAPAN)	GINGA digital-CLe	CL(Base/Mid)																		
	NVP-Ax100	Analog																		
	NVP-Ax135P	Analog																		
Hitachi information & Control Solutions (JAPAN)	NVP-Ax130CL	PoCL-Lite																		
	NVP-Ax135CL/137CL	PoCL-Lite																		
EDEC LINSEY SYSTEM (JAPAN)	IP-7000BD	Analog																		
	MUCap-HA2	Analog																		
	MUCap-HA4	Analog																		
EDEC LINSEY SYSTEM (JAPAN)	EDCap-CL	CL																		
	MUCap-HD2	CL																		

◎ : Board maker official support ○ : Local confirmation at Hitachi Kokusai Electric or each board agency ※ : During confirmation * : Conditional verified

List of Frame Grabber (Box type)

			Mini Camera Link																								
			SCL											PCL		WCL											
			3CCD	Color							B/W				Color	B/W, RAW											
Board Maker	Model	Interface	HV-F202SCL	KP-FD500SCL	KP-FD202SCL	KP-FD140SCL	KP-FR230SCL	KP-FR31SCL	KP-FR200SCL	KP-FR80SCL	KP-FR30SCL	KP-FBR30SCL	KP-F500SCL	KP-F230SCL	KP-F31SCL	KP-F200SCL	KP-F80SCL	KP-F30SCL	KP-FB30SCL	KP-FD500PCL	KP-FD202PCL	KP-FD140PCL	KP-FM/FMR400WCL	KP-FM/FMR200WCL	KP-F/FR500WCL	KP-F145WCL	
FAST (JAPAN)	FVC04	CL(Base)																									
	FVC06	CL		○	○								○	○	○	○			○								
	FVC05	Analog																									
	FV07CLB	CL																					○	○	○	○	
	FV-GP440	Analog																									
FHC3312	CL		○	○									○	○						○	○					○	
DECSYS (JAPAN)	DS-3500	analog																									
	DS-3510	CL(Base)(1TAP)(non-PoC)				※			○	○	○	○				○	○	○	○								
	DM-3000	analog																									
	DM-3001	analog																									
	DM-3010	CL(Base)(1TAP/2TAP)(PoCL/non-PoCL)			○	※	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○	※			○	○
	DS-4610	CL(Base)(1TAP/2TAP)(PoCL/non-PoCL)			○	※	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○	※			○	○
DM-3210	CL(Base/Medium)(1TAP/2TAP/4TAP)(PoCL/non-PoCL)			○	※	○	○	○	○	○	○	○	○	○	○	○	○	○	○		○	※			○	○	
Yaskawa Electric Corporation (JAPAN)	MYVIS YV260	CL																			○	○					

			Mini Camera Link														PoCL-Lite		Camera Link			Analog						
			PCL/WCL											B/W			3CCD			Color		B/W						
			B/W, RAW																									
Board Maker	Model	Interface	KP-F/FR230PCL	KP-F/FR31PCL	KP-F/FR200PCL	KP-F/FR80PCL	KP-F/FR30PCL	KP-FB/FBR30PCL	KP-F200Lite	KP-F80Lite	KP-F30Lite	KP-FM30Lite	KP-FBM30Lite	HV-F22CL/-S1	HV-F31CL/-S1	KP-FD30CL	KP-F120CL	HV-D30	HV-D27A/37A	KP-FD30/M	KP-D20A/B	KP-F30	KP-F33	KP-F80	KP-M20/M30	KP-M1A/M2A/M3A	KP-M2R-S3	
FAST (JAPAN)	FVC04	CL(Base)															○											
	FVC06	CL	○	○										○		○							○	○				
	FVC05	Analog																										
	FV07CLB	CL																					○	○				
	FV-GP440	Analog																					○	○				
FHC3312	CL	○	○											○		○							○	○				
DECSYS (JAPAN)	DS-3500	analog																					○	○	○	○	○	○
	DS-3510	CL(Base)(1TAP)(non-PoC)													○	○	※	※						○	○	○	○	○
	DM-3000	analog																						○	○	○	○	○
	DM-3001	analog																						○	○	○	○	○
	DM-3010	CL(Base)(1TAP/2TAP)(PoCL/non-PoCL)	○	※	○	○	○	○							○	○	※	※						○	○	○	○	○
	DS-4610	CL(Base)(1TAP/2TAP)(PoCL/non-PoCL)	○	※	○	○	○	○							○	○	※	※							○	○	○	○
DM-3210	CL(Base/Medium)(1TAP/2TAP/4TAP)(PoCL/non-PoCL)	○	※	○	○	○	○							○	○	※	※											
Yaskawa Electric Corporation (JAPAN)	MYVIS YV260	CL	○	○	○	○	○																					

◎ : Board maker official support ○ : Local confirmation at Hitachi Kokusai Electric or each board agency ※ : During confirmation * : Conditional verified

List of Optional Lens

KOWA

	Supports 3CCD	Supports 5 megapixels	Supports 4 megapixels	Supports NF Mount
Model	LM**NC*	LM**JC5M/2	LM**XC	LM*NF
Image Format	1/2 type	2/3 type	1 type	1/3 type
Focal Length	4/6/12/25/50mm	12.5/16/25/35mm	12/16/25/35/50mm	2.7/4.5/9mm
Dimensions	ø30 to 48mm	ø38.5 to 43.5mm	ø45 to 57mm	ø21 to 22mm
Mount	C	C	C	NF



Technical Information

• USA: Kowa Optimed, Inc. TEL : +1-(310) 327-1913 FAX : +1-(310) 327-4177 Mail : kowa-usa-info@kowa.com
 • EUROPE: Kowa Europe GmbH TEL : +49-(211) 1793540 FAX : +49-49-(211)-161952 Mail : scope@Kowa-Europe.com

μ • TRON

	Supports 3CCD Zoom	Supports 5 megapixels Zoom	Supports 5 megapixels	Supports 2 megapixels
Model	PH16×8B	PH33×30	HF***J	HS***J
Image Format	1/2 type (HDTV)	1/2 type	2/3 or 1 type	2/3 type
Focal Length	8 to 128mm	30 to 1000mm	12/16/25/35/50mm	8/12/16/25/35/50mm
Dimensions	80×85mm	122×122mm	ø47.5 to 57mm	ø32.5 to 36mm
Mount	C	C	C	C



Technical Information

• Myutron Inc. URL : http://www.myutron.com/index_e.html
 TEL : +81-3-5612-1884 FAX : +81-3-5612-1890

FUJINON

	Supports 3CCD	Supports 5 megapixels	Supports megapixels	
Model	TF**DA-8	HF**SA-1	CF**HA-1	HF**HA-1B
Image Format	1/3 type	2/3 type	1 type	2/3 type
Focal Length	2.8/4/8/15/25mm	12.5/16/25/35/50/75mm	12.5/16/25/35/50/75mm	9/12.5/16/25/35/50/75mm
Dimensions	ø29 to 34mm	ø51mm	ø51mm	ø26.5 to 31.5mm
Mount	C	C	C	C



HF35SA-1



TF2.8DA-8

Technical Information

• USA URL : www.fujinon.com TEL : 0 21 54/9 24-0 FAX : 0 21 54/9 24-2 90 Mail : fujinon@fujinon.de
 • EUROPE URL : www.fujinon.de TEL : +33 (0) 1/39 30 16 16 FAX : +33 (0) 1/30 43 77 21 Mail : fujinon@fujinon.fr

TAMRON

	Supports megapixels		Supports HDTV	
Model	M118FM**	23FM**SP	M13VM288IR	M13VM550
Image Format	1/1.8 type	2/3 type	1/3 type	1/3 type
Focal Length	8/16/25/50mm	16/25/50mm	2.8-8mm Vari-focal	5-50mm Vari-focal
Dimensions	C	C	CS	CS
Mount	ø29mm	ø34mm	ø43.2mm	ø46mm
Note			DC Auto Iris type: M13VG**	



23FM16SP



23FM25SP



23FM50SP

Technical Information

• USA: TAMRON USA, INC. URL : www.tamron.com TEL : 1-631 (858) 8400
 • EUROPE: TAMRON EUROPE GmbH. URL : www.tamron.de TEL : 49 (221) 970325-74

Tokina

	Supports 5 megapixels Telecentric	Long Operation 10X Macro lens	Variable high-zoom lens
Model	KCM-****MP5	KCM-10D-64	KCM-50NII
Image Format	2/3 type	2/3 type	2/3 type
Focal Length	9/12.5/18mm	10X	0.5X to 1.0X
Dimensions	ø48mm	ø43mm	ø36mm
Mount	C	C	C



KCM-0914MP5



KCM-10D-64



KCM-50NII

Technical Information

• Tokina Co.Ltd. URL : <http://www.tokina.co.jp/en/> TEL : +81-49-274-5360

List of Optional Lens

SPACECOM

	Supports HDTV	Supports Megapixels Zoom Day & Night	Supports 5 megapixels	Supports 2 megapixels
Model	TAV2812DCIR-MP	VZ2465RI R-MP	PYXIS**	VELA**
Image Format	1/3 type	1 type	2/3 type	2/3 type
Focal Length	2.8-12mm	24-65mm	8/12/16/25/35mm	8/12/16/25/35mm
Dimensions	CS	C	C	C
Mount	ø41.3mm	80 X 80mm	ø51mm	ø37.5mm
Note	HERCULES	Available DC Auto Iris type MERCURY	PIXIS	VELA



Technical Information

- SPACE inc. URL : http://www.spacecom.co.jp/en_index.html
- USA SPACE COM inc (USA OFFICE) TEL : +1-562-696-0378 FAX : +1-562-696-0797
- Head Office (Japan) TEL : +81-422-31-8180 FAX : +81-422-31-8220

CBC

	Supports Megapixels Manual Iris		Macro Zoom
Model	M0814-MP	M1214-MP	MLH-3XMP
Image Format	2/3 type	2/3 type	2/3 type
Focal Length	8mm	12mm	8.7 to 29.4mm
Dimensions	ø33.5mm	ø33.5mm	ø36.5mm
Mount	C	C	C



Technical Information

- USA: CBC (AMERICA) Corp. URL : www.cbcamerica.com TEL : (1-631) 864-9700 FAX : (1-631) 864-9710
- EUROPE: CBC (EUROPE) LTD. URL : www.cbceurope.com TEL : (44-20) 8732-3333 FAX : (44-20) 8202-3387

MIKAMI

	Supports 3CCD Manual Zoom	
Model	PH6X8 MACRO	J6X11MACRO
Image Format	1/3 type	2/3 type
Focal Length	8 to 48mm	11.5 to 69 mm
Dimensions	ø50.5x92.8mm	ø49.3x98.2mm
Mount	C	C



Technical Information

- MIKAMI & CO., LTD. URL : www.kk-mikami.co.jp TEL : +81-45-914-8222 FAX : +81-45-914-6831

Hitachi Industrial Progressive Scan Camera Line-up

		Image Size							
		VGA	XGA	SXGA	UXGA	2.2M	4.2M	5.0M	
Frame rate	280fps					(RAW)KP-FMR200WCL (B&W)KP-FM200WCL			
	150fps						(RAW)KP-FMR200WCL (B&W)KP-FM200WCL		
	120fps	(RAW)KP-FR31PCL/SCL (B&W)KP-F31PCL/SCL	(3CCD) (RGB) (RAW) (B/W)	3CCD Color RGB Color RAW Color Black and White					GV: GigE Vision CL: Camera Link SCL: Mini Camera Link (non-PoCL) WCL: Mini Camera Link (Selectable non-PoCL or PoCL) PCL: Mini Camera Link (PoCL) Lite: Camera Link (PoCL-Lite) F: IEEE1394
	90fps	(RGB)KP-FD33GV (B&W)KP-F33GV (B&W)KP-FM30Lite (B&W)KP-FBM30Lite							
	60fps	(RAW)KP-FR30PCL/SCL (RAW)KP-FBR30PCL/SCL (B&W)KP-F30PCL/SCL (B&W)KP-FB30PCL/SCL (B&W)KP-F30Lite							
	36fps		(RGB)KP-FD83GV (RAW)KP-FR80PCL/SCL (B&W)KP-F80PCL/SCL (B&W)KP-F80Lite (B&W)KP-F83GV						
	30fps		(3CCD)HV-F31CL	(RGB)KP-FD140PCL/SCL (RGB)KP-FD140GV (B&W)KP-F145WCL (B&W)KP-F145GV (B&W)KP-F140GV	(3CCD)HV-F202SCL (RGB)KP-FD202PCL/SCL (RGB)KP-FD202GV (RAW)KP-FR230PCL/SCL (B&W)KP-F230PCL/SCL (B&W)KP-F202GV				
	28fps				(3CCD)HV-F202GV				
	16fps							(RAW)KP-FR500WCL (B&W)KP-F500WCL (B&W)KP-F500GV	
	15fps		(3CCD)HV-F31F	(3CCD)HV-F22CL (3CCD)HV-F22GV	(RAW)KP-FR200PCL/SCL (B&W)KP-F200PCL/SCL (B&W)KP-F200Lite				
	12fps							(RGB)KP-FD500PCL/SCL	
	9fps							(RGB)KP-FD500GV	
	7.5fps			(3CCD)HV-F22F					

CAUTION: To ensure safe operation, Please read the instruction manual before using this product.

These Specifications are subject to change without notice.

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