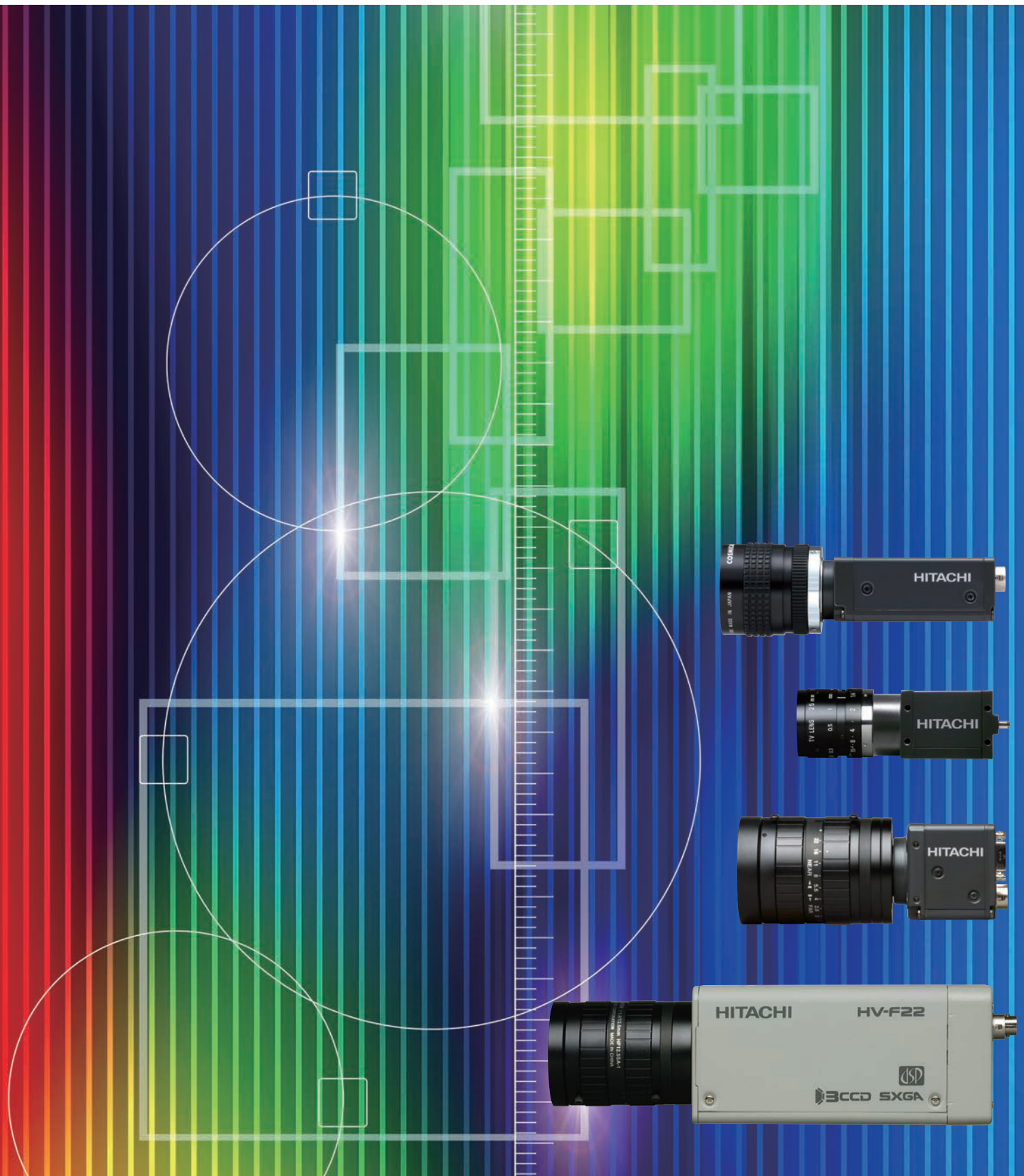





General Brochure


# Cameras for Industries













# Contents

	Model Name	Output	Scan Format	CCD Size	Effective Pixels	Frame Rate	Dimensions (W)x(H)x(D)mm	Mass (g)	Note	page	
<b>GigE Vision (Gigabit Ethernet) Interface Model</b>											
	KP-F140GV	Black & White	Progressive	1/2	SXGA (1392(H) x 1040(V))	30 fps	44 x 29 x 72	140		3	
	KP-F83GV			1/3	XGA (1034(H) x 779(V))	36 fps					
	KP-F33GV			1/3	VGA (656(H) x 494(V))	90 fps					
	KP-FD140GV	1CCD Color (RGB/YUV/RAW)		1/2	SXGA (1392(H) x 1040(V))	30 fps					4
	KP-FD83GV			1/3	XGA (1034(H) x 779(V))	36 fps					
KP-FD33GV	1/3	VGA (656(H) x 494(V))	90 fps								
	HV-F22GV-S2	3CCD Color		1/2	SXGA 1360(H) x 1024(V)	15 fps	65 x 65 x 141	600	Standard model	5	
	HV-F22GV		GENICAM™ Compatible model								








<b>IEEE1394.b Interface Model</b>										
	KP-F140F	Black & White	Progressive	1/2	SXGA (1392 (H) x 1024 (V))	15 fps	44 x 44 x 48	130	Series -S1: White exterior for medical use model -S2: With 12 pin connector model -S3: With 12 pin connector & white exterior for medical use model	7
	KP-F83F			1/3	XGA (1034(H) x 779(V))	30 fps				
	KP-F32F			1/2	VGA (656(H) x 492(V))	60 fps				
	KP-FD140F	1CCD Color (RGB/YUV/RAW)		1/2	SXGA (1392 (H) x 1024 (V))	15 fps				
	KP-FD32F			1/2	VGA (656(H) x 492(V))	60 fps				

<b>IEEE1394.a Interface Model</b>										
	HV-F31F	3CCD Color	Progressive	1/3	XGA (1024(H) x 768(V))	15 fps	65 x 65 x 130	600		8
	HV-F22F			1/2	SXGA (1360(H) x 1024(V))	7.5 fps				

<b>PoCL (Power over CameraLink) Interface Model</b>																	
	KP-F500PCL	Black & White		2/3	5M pixel (2456 (H) x 2058 (V))	16 fps	44 x 44 x 41	110		9							
	KP-FR500PCL	RAW								11							
	KP-F230PCL	Black & White		1/1.8	UXGA (1628 (H) x 1236 (V))	30 fps	29 x 29 x 38			9							
	KP-FR230PCL	RAW								11							
	KP-F31PCL	Black & White								1/3	VGA (659 (H) x 494 (V))	120 fps		9			
	KP-FR31PCL	RAW												11			
	KP-F200PCL	Black & White	Progressive	1/1.8	UXGA (1628 (H) x 1236 (V))	15 fps	29 x 29 x 29	50		10							
	KP-FR200PCL	RAW								12							
	KP-F80PCL	Black & White								XGA (1034(H) x 779(V))	36 fps			10			
	KP-FR80PCL	RAW												12			
	KP-F39PCL	Black & White								1/3	VGA (659 (H) x 494 (V))	91 fps		10			
	KP-FR39PCL	RAW												12			
	KP-F30PCL	Black & White												10			
	KP-FR30PCL	RAW												12			
		KP-FB30PCL								Black & White			60 fps	Camera head: 12 x 12.5 x 47.5 CCU: 29 x 29 x 38	Head: 18 CCU: 50		9
		KP-FBR30PCL								RAW							11
	KP-FD500PCL	1CCD Color		2/3	5M pixel (2456 (H) x 2058 (V))	12 fps	44 x 44 x 41	110		13							
	KP-FD202PCL		1/1.8	UXGA (1628 (H) x 1236 (V))	30 fps	13											
	KP-FD140PCL		1/2	SXGA (1392(H) x 1040(V))		13											

<b>Mini CL (Mini CameraLink) Interface Model</b>																	
	KP-F500SCL	Black & White		2/3	5M pixel (2456 (H) x 2058 (V))	16 fps	44 x 44 x 41	110		9							
	KP-FR500SCL	RAW								11							
	KP-F230SCL	Black & White		1/1.8	UXGA (1628 (H) x 1236 (V))	30 fps	29 x 29 x 38			9							
	KP-FR230SCL	RAW								11							
	KP-F31SCL	Black & White								1/3	VGA (659 (H) x 494 (V))	120 fps		9			
	KP-FR31SCL	RAW												11			
	KP-F200SCL	Black & White	Progressive	1/1.8	UXGA (1628 (H) x 1236 (V))	15 fps	29 x 29 x 29	50		10							
	KP-FR200SCL	RAW								12							
	KP-F80SCL	Black & White								XGA (1034(H) x 779(V))	36 fps			10			
	KP-FR80SCL	RAW												12			
	KP-F39SCL	Black & White								1/3	VGA (659 (H) x 494 (V))	91 fps		10			
	KP-FR39SCL	RAW												12			
	KP-F30SCL	Black & White												10			
	KP-FR30SCL	RAW												12			
		KP-FB30SCL								Black & White			60 fps	Camera head: 12 x 12.5 x 47.5 CCU: 29 x 29 x 38	Head: 18 CCU: 50		9
		KP-FBR30SCL								RAW							11
	KP-FD500SCL	1CCD Color		2/3	5M pixel (2456 (H) x 2058 (V))	12 fps	44 x 44 x 41	110		13							
	KP-FD202SCL		1/1.8	UXGA (1628 (H) x 1236 (V))	30 fps	13											
	KP-FD140SCL		1/2	SXGA (1392(H) x 1040(V))		13											

# Contents

	Model Name	Output	Scan Format	CCD Size	Effective Pixels	Frame Rate	Dimensions (W)x(H)x(D)mm	Mass (g)	Note	page	
<b>CameraLink Interface Model</b>											
	<b>KP-F200CL-S1</b>	Black & White	Progressive	1/1.8	UXGA (1628 (H) x 1236 (V))	30 fps	58 x 58 x 48	220		15	
	<b>KP-F120CL</b>			2/3	SXGA (1392(H) x 1040 (V))	30 fps				15	
	<b>KP-F100BCL</b>	2/3		15 fps		44 x 44 x 78	180	15			
	<b>KP-FD30CL</b>	1CCD Color		1/1.8	VGA (659(H) x 494 (V))	60 fps	58 x 58 x 48	220		16	
	<b>HV-F31CL</b> <b>HV-F31CL-S1</b> <b>HV-F22CL</b> <b>HV-F22CL-S1</b>	3CCD Color		1/3	SXGA (1360(H) x 1024 (V))	30 fps	65 x 65 x 130	600		CL: 30 bit CL-S1: 24 bit	16
	2/3			XGA (1024(H) x 768 (V))	15 fps	16					
<b>EIA-644 Interface Model</b>											
	<b>KP-F120</b>	Black & White	Progressive	2/3	SXGA (1392(H) x 1040 (V))	30 fps	58 x 58 x 48	220		17	
	<b>KP-F100B</b>			2/3		15 fps	44 x 44 x 78	180	17		
<b>Analog Interface Model</b>											
	<b>KP-F80</b> <b>KP-F38</b> <b>KP-F33</b> <b>KP-F30</b>	Black & White	Progressive	1/3	XGA (1034 (H) x 779 (V))	30 fps	29 x 29 x 38.5	55		18	
	VGA (659 (H) x 494 (V))				80 fps	18					
					30 fps	18					
					60 fps	18					
	<b>KP-M30</b> <b>KP-M20</b>	Black & White	Interace	1/3	EIA: 768 (H) x 494 (V) CCIR: 752 (H) x 582 (V)		29 x 29 x 38.5	55		19	
				<b>KP-M1A</b> <b>KP-M2A</b> <b>KP-M3A</b> <b>KP-M2R</b>		2/3		44 x 29 x 72	120		19
1/2		19									
1/3		19									
1/2		19									
	<b>KP-FD30</b> <b>KP-FD30M</b>	1CCD Color	Progressive/ Interace	1/2	VGA (659 (H) x 494 (V))	60 fps	58 x 58 x 48	220	Provides still picture continuation output	20	
	Progressive		20								
	<b>KP-D20A</b> <b>KP-D20B</b>	1CCD Color	Interace	1/3	NTSC: 768 (H) x 494(V) PAL: 752 (H) x 582(V)		44 x 44 x 49	130	KP-D20B-S6: Right angle type KP-D20B-S3: 12pin type, PAL type only	20	
	1/2			20							
	<b>HV-D37A</b> <b>HV-D27A</b>	3CCD Color	Interace	1/3	NTSC 768(H) x 494(V) PAL : 752(H) x 582(V)		Head: 38.5(W)x 46(H)x41.5(D)m CCU:150(W)x 45(H)x170(D)mm	Head: 50 Body: 110		21	
	1/2			21							
	<b>HV-D30</b>	3CCD Color	Interace	1/3	NTSC 768(H) x 494(V) PAL : 752(H) x 582(V)		65 x 65 x 80	400		21	
	<b>HV-D20</b>			1/2	752(H) x 582(V)		65 x 65 x 130	450	PAL only	21	
	<b>KP-DE500</b> <b>KP-E500</b>	EM-CCD Color EM-CCD Black & White	Interace	1/2	658(H) x 489(V)		78 x 63 x 170	610	Color in full motion mode seisitivitu: 0.0009 lx	22	
	Monochrome in full motion mode sensitivity: 0.00003 lx	22									
<b>HDTV/NTSC/PAL Broadcast performance Model</b>											
	<b>HV-HD30</b>	3CMOS HDTV Color	1080i/ 720P	1/3	1280 (H) x 720 (V)		65 x 65 x 125	600	HD-SDI	23	
	<b>DK-H32</b>	3CCD HDTV Color	1080i	2/3	1920(H) x 1080(V)		99 x 105 x 155	1.5k	HD-SDI	23	
	<b>HV-D15AS</b>	3CCD Color		1/2	NTSC: 768(H)x494(V) PAL: 752(H)x582(V)		80 X 85 X 134	900	SDI	24	

## 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™ (Ver 1.00) 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™ (Ver 1.00) 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).

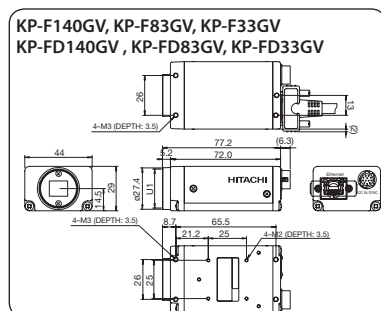
## High resolution &amp; High Frame rate

Model	CCD	Effective pixels	Frame rate
<b>Color (1CCD, RGB/YUV/RAW/MONO)</b>			
KP-FD140GV	1/2	1392 (H) x 1040 (V)	30 fps*1
KP-FD83GV	1/3	1034 (H) x 779 (V)	36 fps
KP-FD33GV	1/3	656 (H) x 494 (V)	90 fps
<b>Black &amp; White (MONO)</b>			
KP-F140GV	1/2	1392 (H) x 1040 (V)	30 fps
KP-F83GV	1/3	1034 (H) x 779 (V)	36 fps
KP-F33GV	1/3	656 (H) x 494 (V)	90 fps

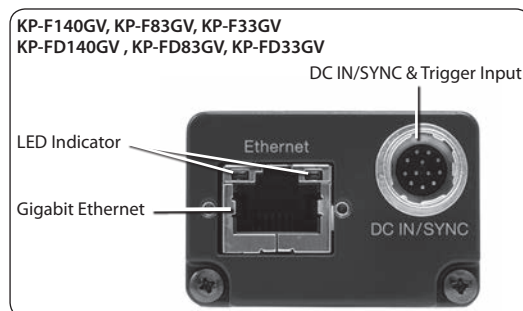
(\*1: Up to SXGA (1280(H) x 960(V)) readout)

	KP-F33GV	KP-F83GV	KP-F140GV	
				
Imaging device	1/3-inch progressive scan interline CCD (with on-chip microlenses)		1/2-inch progressive scan interline CCD (with on-chip microlenses)	
Total number of pixels	692(H) x 504(V)	1077(H) x 788(V)	1434(H) x 1050(V)	
No. of effective pixels	659(H) x 494(V)	1034(H) x 779(V)	1392(H) x 1040(V)	
Pixel size	7.4 μm(H) x 7.4 μm(V) (Square pixel)	4.65 μm(H) x 4.65 μm(V) (Square pixel)		
Scanning area	4.88 mm(H) x 3.66 mm(V)	4.76 mm(H) x 3.57 mm(V)	6.32 mm(H) x 4.76 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	640(H) x 480(V)	1024(H) x 768(V)	1360(H) x 1024(V)
Sensitivity	Frame rate	90 frames per second	36 frames per second	30 frames per second
	Frame rate	550 lx, F4, 3200K	400 lx, F2.8, 3200K	2000 lx, F11, 3200K
Electric shutter speed	PRESET	OFF/Auto (AES) / Manual(PRESET or VARIABLE), OFF is normal exposure(frame rate)		
	VARIABLE	1/90, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second	1/36, 1/60, 1/125, 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
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	5Vp-p ±1 V		
	VD output	5Vp-p ±0.3 V		
Binning mode	Strobe out	5Vp-p ±0.3 V		
	Mode	OFF / ON		
Partial scan	Grabbing image area is adjustable at horizontal / vertical			
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	Approx. 3.3W (Approx. 275mA)	Approx. 3.1W (Approx. 260mA)	Approx. 4.5W (Approx. 375mA)	
Ambient temperature	Performance	0 °C to +40 °C / 30 to 80 %RH		
	Operating	-10 °C to +50 °C / 30 to 80 %RH		
	Storage	-20 °C to +60 °C / 20 to 90 %RH		
Vibration endurance	68.65 m/s <sup>2</sup> or less(10 to 200 Hz, 30 minutes each on XYZ axes) (Do not subject to strong vibration for long periods of time.)			
Shock endurance	490.3 m/s <sup>2</sup> or less (vertical, horizontal, once each face)			
External dimensions	44(W) x 29(H) x 72(D) mm(not including lens and protrusions)			
Mass	Approx. 140 g (without lens)			

## Dimensions



## Rear View



## Standard composition

- KP-F140GV, KP-F83GV, KP-F33GV  
KP-FD140GV, KP-FD83GV, KP-FD33GV
- Camera
  - CD-ROM (Operation manual / driver software)

## KP-FD140GV, KP-FD83GV, KP-FD33GV

### High color fidelity (Color Model)

RGB primary color mosaic filter achieve high color fidelity.

### Versatile CCD drive functions

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

### White balance (Color Model)

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

### 6 color independent masking (Color Model)




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

### 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 (Color Model)

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.

		KP-FD33GV	KP-FD83GV	KP-FD140GV
				
Imaging device		1/3-inch progressive scan interline CCD (with on-chip microlenses)		1/2-inch progressive scan interline CCD (with on-chip microlenses)
	Total number of pixels	692(H) x 504(V)	1077(H) x 788(V)	1434(H) x 1050(V)
	No. of effective pixels	659(H) x 494(V)	1034(H) x 779(V)	1392(H) x 1040(V)
	Pixel size	7.4 μm(H) x 7.4 μm(V) (Square pixel)		
	Color filter	RGB primary color mosaic filter		
Scanning area		4.88 mm(H) x 3.66 mm(V)	4.76 mm(H) x 3.57 mm(V)	6.32 mm(H) x 4.76 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	659(H) x 492(V)	1024(H) x 768(V)	1360(H) x 1024(V)
	Frame rate	90 frames per second		
		*Frame rate is different for following format		
		RGB 12bit: 60 frames per second	RGB 12bit: 24 frames per second	RGB 8bit: 26 frames per second RGB 10bit: 18 frames per second RGB 12bit: 13 frames per second YUV 12bit: 16 frames per second
Sensitivity		2000 lx, F4, 3200K	2000 lx, F4, 3200K	2000 lx, F5.6, 3200K
Electric shutter speed		OFF/Auto(AES)/Manual(PRESET or VARIABLE), OFF is normal exposure(frame rate)		
	PRESET	1/90, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second	1/36, 1/60, 1/125, 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 Vp-p ±1 V		
External sync signal	VD output	5 Vp-p ±0.3 V		
	Strobe out	5 Vp-p ±0.3 V		
Partial scan		Grabbing image area is adjustable at horizontal / vertical		
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		Adjustable		
Sharpness		Adjustable		
Black level		Adjustable		
Knee		Adjustable		
Power supply		DC+12 V plus minus 1 V (input from 12-pin connector), 48 V (PoE)		
Power consumption		Approx. 3.8 W (Approx. 315 mA)	Approx. 3.6 W (Approx. 300 mA)	Approx. 5.0 W (Approx. 415 mA)
Ambient temperature	Performance	0 °C to +40 °C / 30 to 80 %RH		
	Operating	-10 °C to +50 °C / 30 to 80 %RH		
	Storage	-20 °C to +60 °C / 20 to 90 %RH		
Vibration endurance		68.65 m/s <sup>2</sup> or less(10 to 200 Hz, 30 minutes each on XYZ axes) (Do not subject to strong vibration for long periods of time.)		
Shock endurance		490.3 m/s <sup>2</sup> or less (vertical, horizontal, once each face)		
External dimensions		44(W) x 29(H) x 72(D) mm (not including lens and protrusions)		
Mass		Approx. 140 g (without lens)		
Supplied equipment		Camera and CD-ROM (Operation manual / driver software)		
Optional accessories		Tripod adaptor (TA-M1), LAN cable (Enhanced category 5e or Category 6)		

## 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™ (Ver 1.00) compatible

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

### High resolution

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

### High Precision digital Processing

The single chip 3 million gates 0.18μm 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, microscope, 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 electronic 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

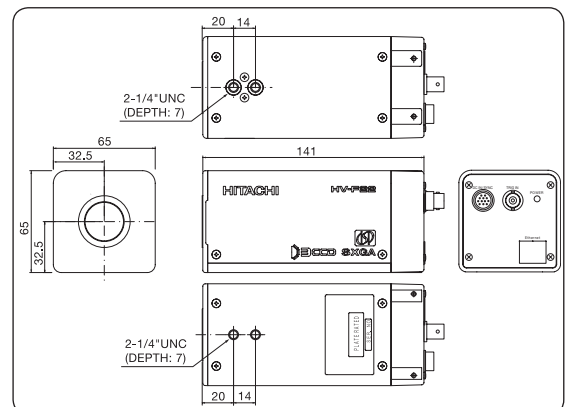
Various camera functions are available for adjustment through the easy to use GUI software which is included with the camera.

## HV-F22GV-S2/ F22GV

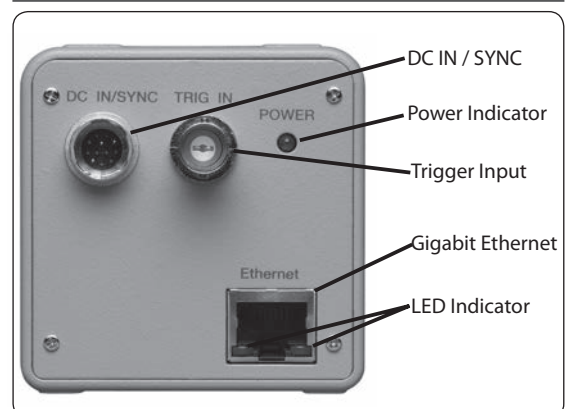


Imaging device	Total number of pixels	1434(H) x 1050(V)
	No. of effective pixels	1360(H) x 1024(V)
	Pixel size	4.65 μm(H) x 4.65 μm(V) (Square pixel)
	Optical system	1/2-inch F1.6 prism
Scanning area	6.32 mm(H) x 4.76 mm(V)	
Scanning system	Progressive	
Sync system	Internal / external (HD/VD automatically switch)	
Lens mount	C mount	
Flange focal distance	17.526 mm	
Video output	Interface	Gigabit Ethernet
	Protocol	GigE Vision compliant
	Transfer rate	1 Gbit per second
	Image format	RGB 8 bit
	Image size	1360(H) x 1024(V)
Sensitivity	Frame rate	15 frames per second
	2000 lx, F8 (at 1/30 second shutter)	
Electric shutter speed	Variable	Auto(AES) / Variable / Accumulate mode
	AES	1/15 to 1/100,000 second
	Accumulate	1/15 to 1/100,000 second
External trigger shutter	Mode	Fixed shutter, One trigger
	Input	Via Gigabit Ethernet cable (Software trigger) or 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. 9.0 W (DC+12 V)	
Ambient temperature	Operating	0 °C to +40 °C
	Storage	-20 °C to +60 °C
Vibration endurance	24.5 m/s <sup>2</sup> or less (10 to 200 Hz, 30 minutes each on XYZ axes) (Do not subject to strong vibration for long periods of time.)	
Shock endurance	392 m/s <sup>2</sup> or less (vertical, horizontal, once each face)	
External dimensions	65(W) x 65(H) x 141(D) mm (not including lens and protrusions)	
Mass	Approx. 600 g (without lens)	

## Dimensions



## Rear View



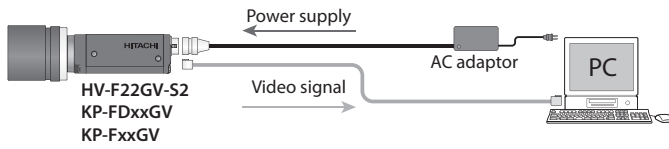
## Standard composition

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

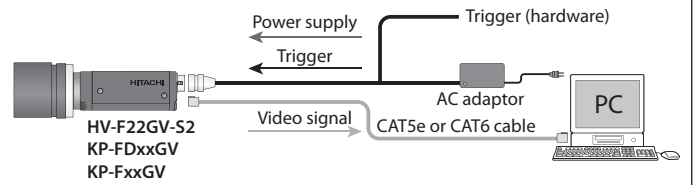
## Common Data for GigE Vision Interface Cameras

### System configuration

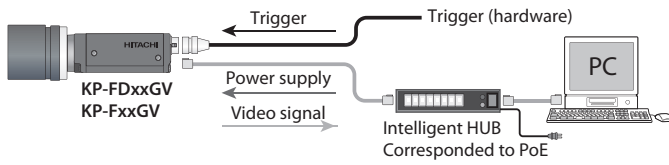
Direct connection to PC and triggered via Ethernet (software trigger)



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



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



### Optional Accessories

Type		Black and White	Color	3CCD
Model Name		KP-F140GV, KP-F83GV, KP-F33GV	KP-FD140GV, KP-FD83GV, KP-FD33GV	HV-F22GV
Tripod Adaptor	TA-M1	○	○	
Camera Cable	(2m) C-201KSM	○	○	○
	(5m) C-501KSM	○	○	○
	(10m) C-102KSM	○	○	○
12 Pin Plug	HR10A-10P-12S	○	○	○
Dummy Glass	ARC1214	*1	○	
IR-Cut Filter	IRC650	○	*2	

\*1: ARC1214 is equipped in the KP-F type camera.

\*2: IRC650 is equipped in the KP-FD type camera.

**IEEE1394.b****Black & White****Progressive****KP-F140F, KP-F83F, KP-F32F****IEEE1394.b****1CCD Color (RGB/YUV/RAW)****Progressive****KP-FD140F, KP-FD32F**

### Main Features

#### IEEE1394.b Interface

- The IEEE1394.b interface allows direct high speed data transfer between the camera and the PC using a small 8 conductor cable.
- The 800 Mbps transfer speed of the IEEE-1394.b interface permits higher frame rates for high resolution cameras.
- Multiple cameras can share the IEEE-1394.b bus using a simple daisy chain connection.

#### High resolution and high frame rates

**KP-F140F, KP-FD140F** 1.45 million pixels for high resolution (SXGA) at 15 frames per second. Designed for High Resolution inspection.

**KP-F83F** 805,000 pixels for a high frame rate of 30 frames per second at standard resolution. Designed for high speed and high resolution inspection.


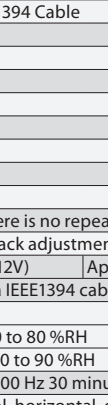
**KP-F32F, KP-FD32F** 330,000 pixels for standard resolution (VGA) at a high frame rate of 60 frames per second. Designed for high speed inspection.

#### Various functions

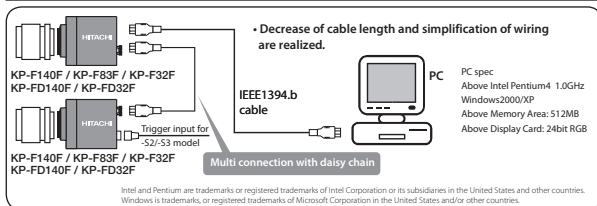
- Electronic shutter
- Daisy chain
- Independent 6 color masking (color model)
- External sync
- Remote control
- Daisy chain
- Hardwired Trigger
- Partial scan
- White balance (color model)
- Remote control

#### Series

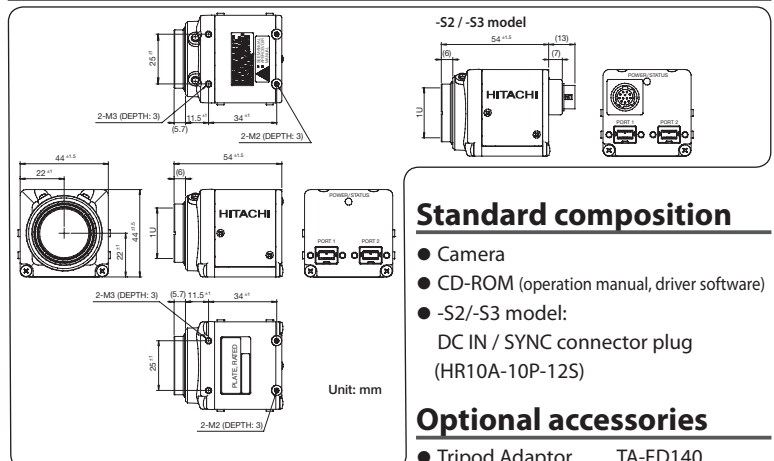
- S1: White exterior for medical use model
- S2: With 12 pin connector model
- S3: With 12 pin connector & white exterior for medical use model

	KP-F140F	KP-F83F	KP-F32F	KP-FD140F	KP-FD32F
					
			<b>KP-FxxxF-S3</b>		
<b>Imaging device</b>	1/2-inch interline CCD	1/3-inch interline CCD	1/2-inch interline CCD		
<b>Total pixels</b>	1434 (H) x 1050 (V)	1079(H) x 789(V)	692(H) x 504(V)		
<b>Effective pixels</b>	1392 (H) x 1024 (V)	1034(H) x 779(V)	656(H) x 492(V)		
<b>Pixel size</b>	4.65 μm (H) x 4.65 μm (V)		9.9 μm (H) x 9.9 μm (V)		4.65 μm (H) x 4.65 μm (V)
<b>Color filter</b>	—		RGB primary color mosaic filters		
<b>Scanning system</b>	Progressive scan				
<b>Synchronization</b>	Internal / external (auto selection)				
<b>Video signal output</b>	Interface: IEEE1394.b (FireWire800) Protocol: IEEE1394-based Digital Camera Specification Version 1.31 compliant Transfer rate: 800 / 400 / 200 Mbps				
<b>Image format</b>	MONO8 / MONO16			RGB24 / YUV(4:2:2) / Raw8 / Raw16	
<b>Image size</b>	1360(H)x1024(V), 1280(H)x960(V) 1024(H)x768(V), 800(H)x600(V) 640(H)x480(V)	1024(H) x 768(V) 800(H) x 600(V) 640(H) x 480(V)	656 (H) x 492 (V) 640 (H) x 480 (V)	1360(H)x1024(V), 1280(H)x960(V) 1024(H)x768(V), 800(H)x600(V) 640(H)x480(V)	656 (H) x 492 (V) 640 (H) x 480 (V)
<b>Frame rate</b>	15fps (Mono8, 1360 x 1024)	30fps (Mono8, 1024 x 768)	60fps (Mono8, 656 x 492)	15 fps (RGB24, 1360 x 1024)	60 fps (RGB24, 656 x 492)
<b>Standard sensitivity</b>	2000 lx F8		2000 lx F5.6	2000 lx F8	2000 lx F5.6
<b>Gain</b>	Auto / Manual (0 dB to 18 dB)				
<b>Electric shutter</b>	Auto (AES) / Manual (VARIABLE) 1/100,000 second to 10 second				
<b>External trigger shutter</b>	Mode: Fixed shutter (Mode0), One trigger (Mode1), Reset control (Mode14), VD Sync (Mode15) Input: Software Trigger: 1394 Cable Hardware Trigger: 1394 Cable (Hitachi System) standard model, or 12 pin connector on S2 or S3 model.				
<b>White balance</b>	—			ATW / MANUAL / One-Push	
<b>Gamma</b>	OFF / LUT				
<b>Masking</b>	—			OFF / ON (6 color independent masking)	
<b>Saturation</b>	—			Adjustable	
<b>Sharpness</b>	Adjustable				
<b>Brightness</b>	Adjustable				
<b>Time stamp</b>	OFF/ON				
<b>Cycle timer sync</b>	OFF/ON				
<b>Daisy chain</b>	Possible. Even if there is no repeater. If two are connected, the frame rate become half.				
<b>Lens mount</b>	C mount (Flange-back adjustment)				
<b>Power supply</b>	Approx. 4.1W (DC+12V)	Approx. 3.2W (DC+12V)	Approx. 3.5W (DC+12V)	Approx.3.8 W (DC+12 V)	Approx. 3.6 W (DC+12 V)
	DC+8V to +30V (Via IEEE1394 cable) or external input via 12 pin connector for S2 and S3 model.				
<b>Ambient temperature</b>	Operating: -10 °C to +50 °C, 30 to 80 %RH Note: If operated continuously, be sure to use at 0 °C to +40 °C (104°F) for long term stable performance. Storage: -20 °C to +60 °C / 20 to 90 %RH				
<b>Vibration endurance</b>	68.56 m/s <sup>2</sup> (10 to 200 Hz 30 minutes each on XYZ axes) *Please do not add the strong vibration over long time.				
<b>Shock endurance</b>	490.3 m/s <sup>2</sup> (vertical, horizontal, once each faze)				
<b>Dimensions</b>	44 (W) x 44 (H) x 48 (D) mm (not including lens)				
<b>Mass</b>	Approx. 130 g (not including lens)				

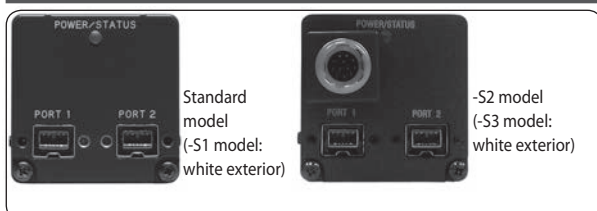
### System configuration



### Dimensions



### Rear View





## HV-F31F, HV-F22F

## 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  $\mu\text{m}$  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, microscope, 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 electronic shutter mode (AES)

## Improved operation ease

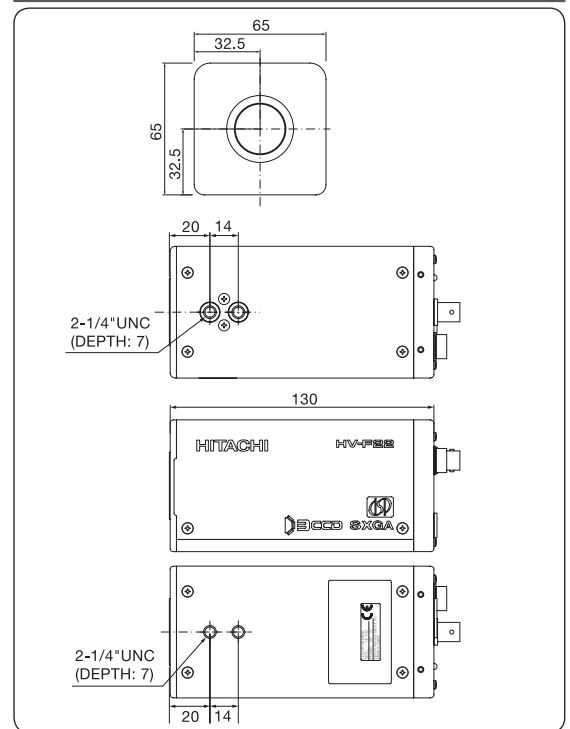
- Provides 4 application file
- Realtime automatic white balance function (ATW)
- Automatic Exposure (ALC)(Automatic level control) (Digital light measuring utilized a scene in to 64 divided sensing areas)
- Focus data output (serial data)
- 2 mode gain control( AGC function, 1 dB step programmable gain 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

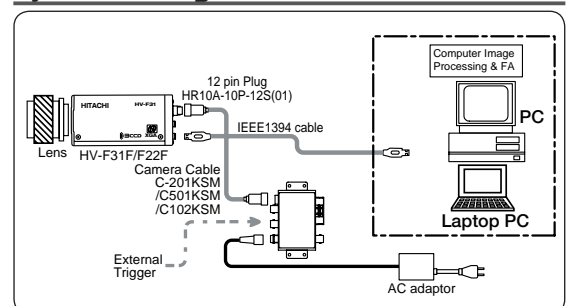
Various camera functions are available for adjustment through the easy to use GUI software which is included with the camera.

		HV-F31F	HV-F22F
			
Imaging device	Total number of pixels	1/3-inch progressive scan inter-line CCD (R, G, B 3 CCD)	1/2-inch progressive scan inter-line CCD (R, G, B 3 CCD)
	No. of effective pixels	1077(H) x 788(V)	1392(H) x 1050(V)
	Pixel size	4.65 $\mu\text{m}$ (H) x 4.65 $\mu\text{m}$ (V) (Square pixel)	
	Optical system	1/3-inch F2.2 prism	1/2-inch F1.6 prism
	Scanning area	4.76 mm(H) x 3.53 mm(V)	6.32 mm(H) x 4.76 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	1024(H) x 768(V), 800(H) x 600(V)	1360(H) x 1024(V), 1280(H) x 960(V), 640(H) x 480(V)
Frame rate	7.5 frames per second (RGB 24 bit, 1024 x 768)	7.5 frames per second (RGB 24 bit, 1360 x 1024)	
Sensitivity		2000 lx, F5.6 (at 1/30 second shutter)	2000 lx, F8 (at 1/30 second shutter)
Electric shutter speed	Variable	1/30 to 1/100,000 second	
	AES	OFF to 1/100,000 second	
	Accumulate	1/30 to 4 second (1 frame step)	
External trigger shutter	Mode	Fixed shutter, One trigger	
	Input level	Low: 0 V DC, High: 3 to 24 V DC	
External sync signal (Strobe out)		5 Vp-p $\pm$ 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+12V (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		24.5 m/s <sup>2</sup> or less (10 to 200 Hz, 30 minutes each on XYZ axes) (Do not subject to strong vibration for long periods of time.)	
Shock endurance		392 m/s <sup>2</sup> or less (vertical, horizontal, once each face)	
External dimensions		65(W) x 65(H) x 130(D) mm (not including lens and protrusions)	
Mass		Approx. 600 g (without lens)	

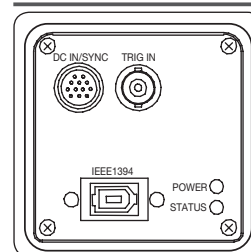
## Dimensions



## System configuration



## Rear View



## Standard composition

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

KP-F500PCL/SCL, KP-F230PCL/SCL, KP-F31PCL/SCL, KP-FB30PCL/SCL

Main Features

Mini CL (Mini CameraLink)

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

PoCL (Power over CameraLink)

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

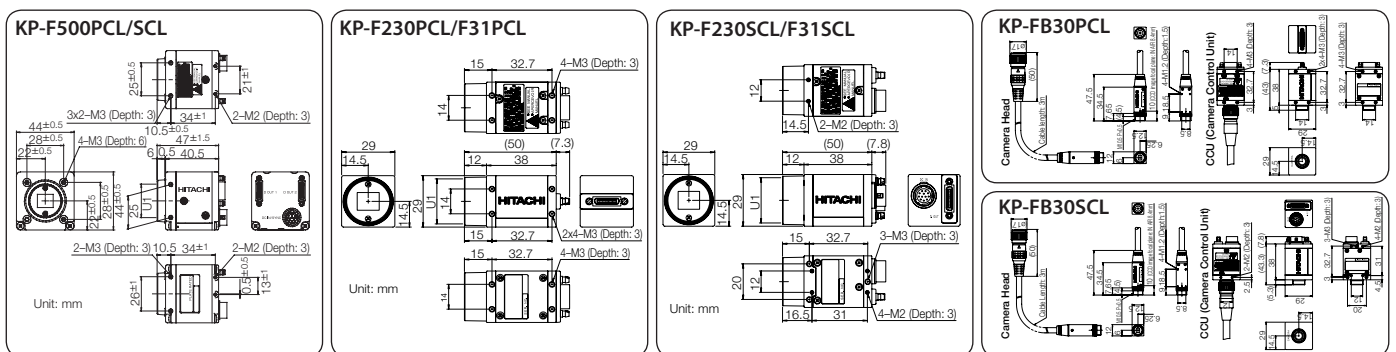
High Resolution & High Speed

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-F500PCL/SCL	5.05 Megapixel	16 frame/second
KP-F230PCL/SCL	2.01 Megapixel	30 frame/second
KP-F200PCL/SCL	2.01 Megapixel	15 frame/second
KP-F80PCL/SCL	0.81 Megapixel	36 frame/second
KP-F31PCL/SCL	0.33 Megapixel	120 frame/second
KP-F39PCL/SCL	0.33 Megapixel	91 frame/second
KP-F30PCL/SCL	0.33 Megapixel	60 frame/second
KP-FB30PCL/SCL	0.33 Megapixel	60 frame/second

	KP-F500PCL/SCL	KP-F230PCL/SCL	KP-F31PCL/SCL	KP-FB30PCL/SCL
				
<b>Imaging device</b>	2/3-inch interline CCD	1/1.8-inch interline CCD	1/3-inch interline CCD	
<b>Total pixels</b>	2536 (H) x 2068 (V)	1688 (H) x 1248 (V)	692 (H) x 504 (V)	
<b>Effective pixels</b>	2456 (H) x 2058 (V)	1628 (H) x 1236 (V)	659 (H) x 494 (V)	
<b>Pixel size</b>	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)	
<b>Sensing area</b>	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)	
<b>Scanning system</b>	Progressive			
<b>Aspect ratio</b>	5 : 4	4 : 3		
<b>Frame rate</b>	16 frames per second (full pixel readout)	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)
<b>Horizontal drive frequency</b>	64.0000 MHz	72.0000 MHz	49.090902 MHz	25.5454 MHz
<b>Horizontal scanning frequency</b>	33.264 kHz	37.5 kHz 33.898 kHz (vertical 2 pixel addition)	62.937 kHz 57.618 kHz (vertical 2 pixel addition)	31.468 kHz
<b>Vertical scanning frequency</b>	16.00 Hz (full pixel readout) 31.98 Hz (vertical 2 pixel addition mode)	29.95 Hz (full pixel readout) 54.06 Hz (vertical 2 pixel addition)	119.88 Hz (full pixel readout) 219.08 Hz (vertical 2 pixel addition)	59.94 Hz
<b>Sync system</b>	Internal			
<b>Lens mount</b>	C mount (Flange focal distance = 17.526 mm)			Special mount (Flange focal distance = 8.4 mm)
<b>Video output</b>	Digital output (CameraLink) 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 (CameraLink) Base configuration: 36.0000 MHz x 2 TAP (Note: maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 24.545451 MHz x 2 TAP (Note: maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 24.5454 MHz (Note: maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)
<b>Resolution</b>	Horizontal/Vertical: 2000TV lines	Horizontal / Vertical: 1200 TV lines	Horizontal: 500 TV lines / Vertical: 490 TV lines	
<b>Sensitivity</b>	400 lx, F5.6, 3200 K	500 lx, F5.6, 3200 K	550 lx, F4, 3200 K	
<b>Minimum illumination</b>	1.0 lx (F1.4, MAX GAIN, without IR cut filter)	3.9 lx (F1.4, MAX GAIN)	8.6 lx (F1.4, MAX GAIN)	
<b>Signal noise to ratio</b>	48dB	45 dB	50 dB	
<b>Electric shutter</b>	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)
<b>Gamma</b>	γ = 1			
<b>Frame on demand</b>	<b>Mode</b> (A) Fixed shutter (8steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) Reset control mode (D) VD reset mode
<b>Trigger input</b>	CameraLink (CC1) or DCIN/SYNC connector			
<b>Partial scan</b>	Selectable start position and height of picture grabbing in 1H step.			
<b>Power supply voltage</b>	12 ± 1 VDC			
<b>Current consumption</b>	Approx. 310 mA (Approx. 3.7W) *MAX partial scan 1H: Approx.390 mA (Approx. 4.7W)	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)
<b>Ambient temperature</b>	<b>Performance</b> 0 to +40 °C (+32 to +104 °F), less than 90 % RH (without dew condensation) <b>Operation</b> 10 to +50 °C (+14 to 122 °F), less than 90 % RH (without dew condensation) <b>Storage</b> -20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)			
<b>Vibration endurance</b>	10 to 55Hz (2.37 to 71.7 m/s <sup>2</sup> ), sweep: 1minute, XYZ, 30 min	98 m/s <sup>2</sup> (Acceleration: constant) 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes		
<b>Shock endurance</b>	490.3 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)	686 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)		
<b>External dimensions</b>	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
<b>Mass</b>	Approx. 110 g	Approx. 50 g		Head: Approx. 18 g CCU: Approx. 50g (without cable)

Dimensions



KP-F200PCL/SCL, KP-F80PCL/SCL, KP-F39PCL/SCL, KP-F30PCL/SCL

Frame Shutter

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

Multi-step Shutter

A multi-step electronic shutter along with a variable speed electronic 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 CameraLink interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

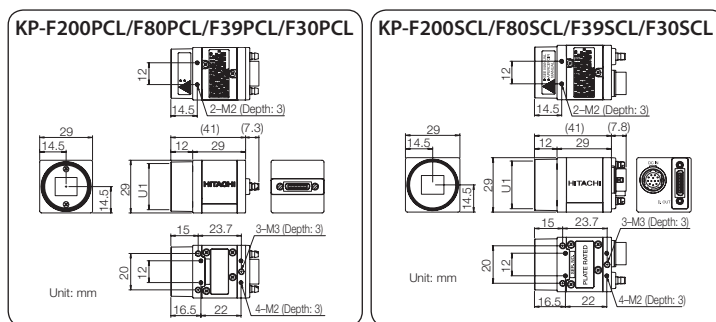
The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.

Selectable bit depth

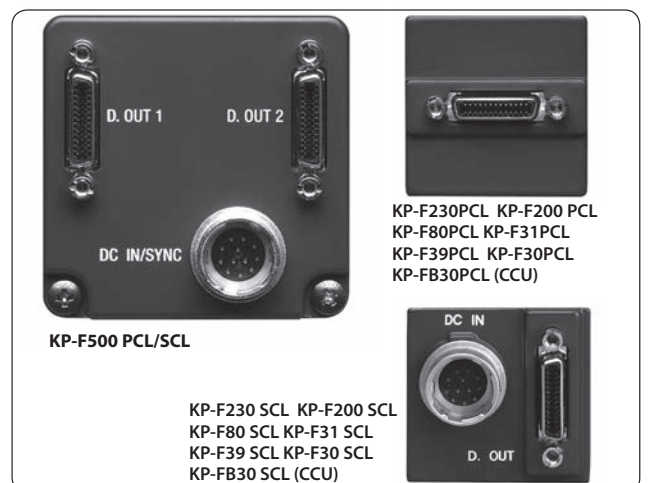
12-/10-/8-bit	KP-F500PCL/SCL
10-/8-bit	KP-F230PCL/SCL, KP-F200PCL/SCL, KP-F80PCL/SCL, KP-F31PCL/SCL, KP-F39PCL/SCL, KP-F30PCL/SCL, KP-FB30PCL/SCL

	KP-F200PCL/SCL	KP-F80PCL/SCL	KP-F39PCL/SCL	KP-F30PCL/SCL
Imaging device	1/1.8-inch interline CCD	1/3-inch interline CCD		
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)	
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)	91 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	46.875 kHz	31.468 kHz
Vertical scanning frequency	14.97 Hz	35.79 Hz	91.73 Hz	59.94 Hz
Sync system	Internal			
Lens mount	C mount (Flange focal distance = 17.526 mm)			
Video output	Digital output (CameraLink) Base configuration: 36.0000 MHz (Note: maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 36.0000 MHz (Note: maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 36.0000 MHz (Note: maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 24.5454 MHz (Note: 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	400 lx, F4, 3200 K	400 lx, F2.8, 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)	2.0 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, 1/91, 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 mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode Trigger input CameraLink (CC1) *When Reset control mode CC1 and CC2 are used	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	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) Reset control mode (D) VD reset mode
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. 150 mA (approx. 1.8 W)	Approx. 120 mA (approx. 1.5 W)
Ambient temperature	Performance 0 to +40 °C (+32 to +104 °F), less than 90 % RH (without dew condensation) Operation 10 to +50 °C (+14 to 122 °F), less than 90 % RH (without dew condensation) Storage -20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)			
Vibration endurance	98 m/s <sup>2</sup> (Acceleration: constant) 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes			
Shock endurance	686 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)			
External dimensions	29 (W) x 29 (W) x 29 (D) mm (Not including protrusions)			
Mass	Approx. 50 g			

Dimensions



Rear View



KP-FR500PCL/SCL, KP-FR230PCL/SCL, KP-FR31PCL/SCL, KP-FBR30PCL/SCL

Main Features

Mini CL (Mini CameraLink)

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

PoCL (Power over CameraLink)

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

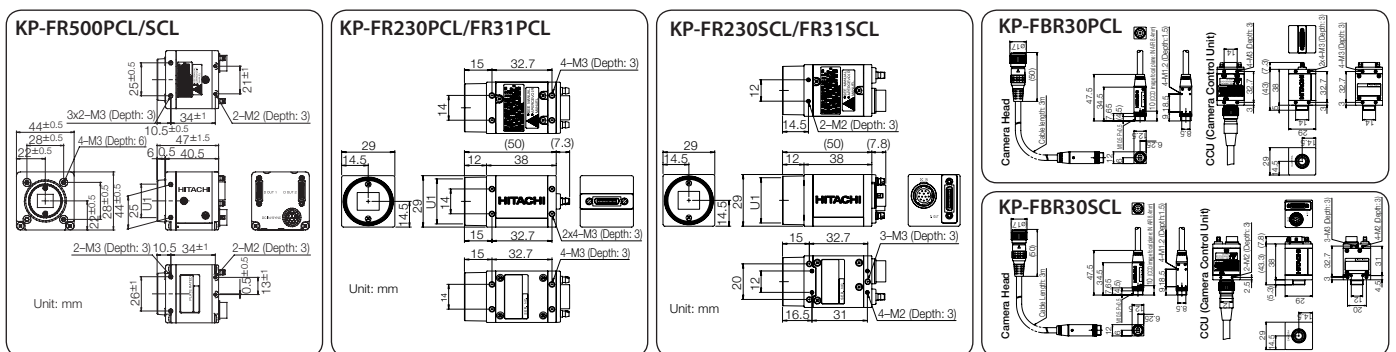
High Resolution & High Speed

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-FR500PCL/SCL	5.05 Megapixel	16 frame/second
KP-FR230PCL/SCL	2.01 Megapixel	30 frame/second
KP-FR200PCL/SCL	2.01 Megapixel	15 frame/second
KP-FR80PCL/SCL	0.81 Megapixel	36 frame/second
KP-FR31PCL/SCL	0.33 Megapixel	120 frame/second
KP-FR39PCL/SCL	0.33 Megapixel	91 frame/second
KP-FR30PCL/SCL	0.33 Megapixel	60 frame/second
KP-FBR30PCL/SCL	0.33 Megapixel	60 frame/second

		KP-FR500PCL/SCL	KP-FR230PCL/SCL	KP-FR31PCL/SCL	KP-FBR30PCL/SCL
					
Imaging device	Total pixels	2/3-inch interline CCD 2536 (H) x 2068 (V)	1/1.8-inch interline CCD 1688 (H) x 1248 (V)	1/3-inch interline CCD 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 (CameraLink) 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 (CameraLink) Base configuration: 36.0000 MHz x 2 TAP (Note: maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 24.545451 MHz x 2 TAP (Note: maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (CameraLink) Base configuration: 24.5454 MHz (Note: 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 (8steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) Reset control mode (D) VD reset mode
	Trigger input	CameraLink (CC1) or DCIN/SYNC connector	CameraLink (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. 310 mA (Approx. 3.7W) *MAX partial scan 1H: Approx.390 mA (Approx. 4.7W)	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 (without dew condensation)			
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH (without dew condensation)			
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)			
Vibration endurance	10 to 55Hz (2.37 to 71.7 m/s <sup>2</sup> ), sweep: 1minute, XYZ, 30 min	98 m/s <sup>2</sup> (Acceleration: constant) 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes			
Shock endurance	490.3 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)	686 m/s <sup>2</sup> (Drop test, once each top, bottom, 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)	

Dimensions



KP-FR200PCL/SCL, KP-FR80PCL/SCL, KP-FR39PCL/SCL, KP-FR30PCL/SCL

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 electronic shutter along with a variable speed electronic 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 CameraLink interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

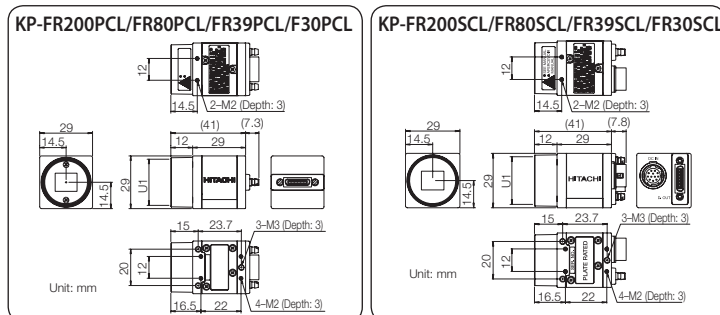
The start position and height of the image can be adjusted. Higher frame rates are possible by using partial scan mode.

Selectable bit depth

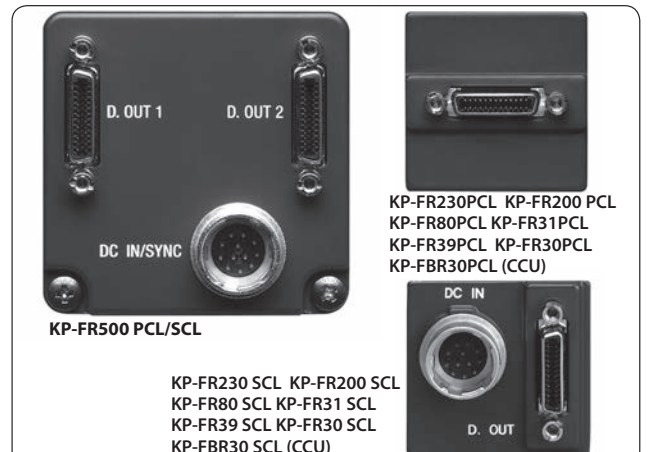
12-/10-/8-bit	KP-FR500PCL/SCL
10-/8-bit	KP-FR230PCL/SCL, KP-FR200PCL/SCL, KP-FR80 PCL/SCL, KP-FR31PCL/SCL, KP-FR39PCL/SCL, KP-FR30PCL/SCL, KP-FBR30PCL/SCL

	KP-FR200PCL/SCL	KP-FR80PCL/SCL	KP-FR39PCL/SCL	KP-FR30PCL/SCL
Imaging device	Total pixels	1/1.8-inch interline CCD 1688 (H) x 1248 (V)	1/3-inch interline CCD 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)
	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)	91 frames per second (full pixel readout)	60 frames per second (full pixel readout)
Horizontal drive frequency	36.0000 MHz			
Scanning frequency	Horizontal: 18.75 kHz, Vertical: 14.97 Hz	Horizontal: 28.346 kHz, Vertical: 35.79 Hz	Horizontal: 46.875 kHz, Vertical: 91.73 Hz	Horizontal: 31.468 kHz, Vertical: 59.94 Hz
Sync system	Internal			
Lens mount	C mount (Flange focal distance = 17.526 mm)			
Video output	Digital output (CameraLink) Base configuration: 36.0000 MHz (Note: maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)		Digital output (CameraLink) Base configuration: 36.0000 MHz (Note: maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	
	Digital output (CameraLink) Base configuration: 24.5454 MHz (Note: maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)		Digital output (CameraLink) Base configuration: 24.5454 MHz (Note: 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	2000 lx, F8, 3200 K		2000 lx, F4, 3200 K	
Minimum illumination	5.0 lx (F1.4, MAX GAIN)		20 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, 1/60, 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	CameraLink (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)	
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH (without dew condensation)		
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH (without dew condensation)		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	98 m/s <sup>2</sup> (Acceleration: constant) 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes			
Shock endurance	686 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)			
External dimensions	29 (W) x 29 (W) x 29 (D) mm (Not including protrusions)			
Mass	Approx. 50 g			

Dimensions



Rear View



KP-FD500PCL/SCL, KP-FD202PCL/SCL, KP-FD140PCL/SCL

Main Features

Mini CL (Mini CameraLink)

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

PoCL (Power over CameraLink)

The PoCL version is connected by a single (PoCL) Mini CameraLink 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 electronic shutter along with a variable speed electronic 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 CameraLink 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

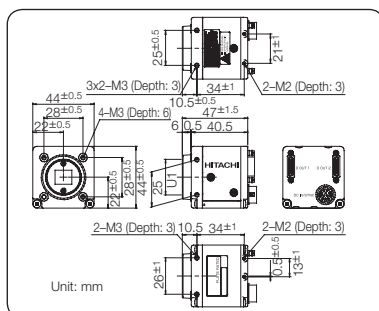
Selectable white balance adjustment method of ATW (auto-tracking), Manual (manual setting of R and B gain) or One-push (one-push auto adjustment)

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.

		KP-FD500PCL/SCL	KP-FD202PCL/SCL	KP-FD140PCL/SCL
				
Imaging device	Total pixels	2/3-inch progressive scan interline CCD 2536(H) x 2068(V)	1/1.8-inch progressive scan interline CCD 1688(H) x 1248(V)	1/2-inch progressive scan interline CCD 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	CameraLink 64.0000 MHz	CameraLink 72.0000 MHz	CameraLink 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, F1.1, 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)			
Frame on demand	Mode: (A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode Trigger input: CameraLink (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 (without dew condensation)		
	Operation	-10 to +50 °C (+14 to +122 °F), less than 90 % RH (without dew condensation)		
	Storage	-20 to +60 °C (-4 to +140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	10 to 55Hz (2.37 to 71.7 m/s <sup>2</sup> ), sweep: 1minute, XYZ, 30 min			
Shock endurance	490.3 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)			
External dimensions	44 (W) x 44 (H) x 41 (D) mm (not including mount protrusions)			
Mass	Approx. 110 g			

Dimensions



Rear View





**KP-F200CL-S1, KP-F120CL, KP-F100BCL**

**Main Features**

**High speed read out**

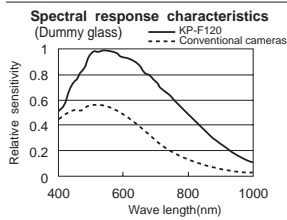
Full pixel independent readout: 30 frames/second (KP-F200CL-S1/F120CL), 15 frames/second (KP-F100BCL)

Partial Scan (except KP-F100BCL): Read out up to over 190 frames/second max.

**High resolution**

2/3-inch CCD (KP-F200CL-S1), 2/3-inch CCD (KP-F120CL, KP-F100BCL)

Effective pixels 1628(H)x1236(V) (KP-F200CL-S1), 1392(H) X 1040(V) and square lattice pixels.



**Near infrared sensitivity (KP-F120CL)**

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 electronic shutter**



8 steps electronic shutter up to 1/50000 second.

**Frame on demand**

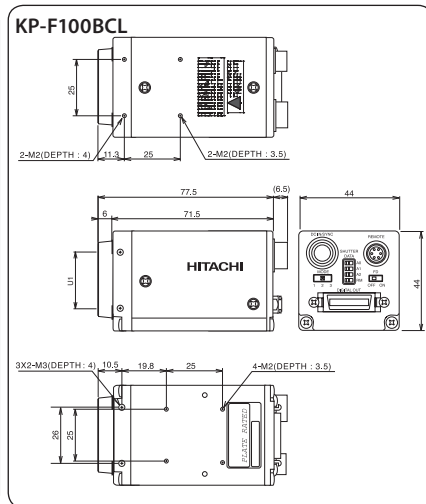
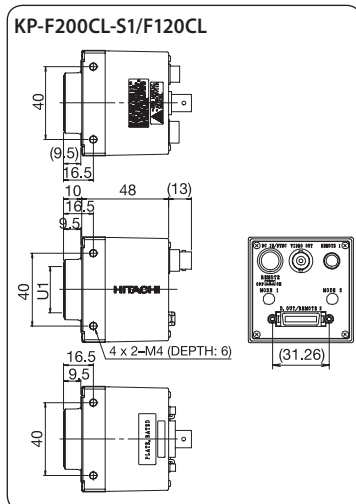
An external trigger signal input can be used to capture an image at a desired timing for instant view or processing.

**Remote control**

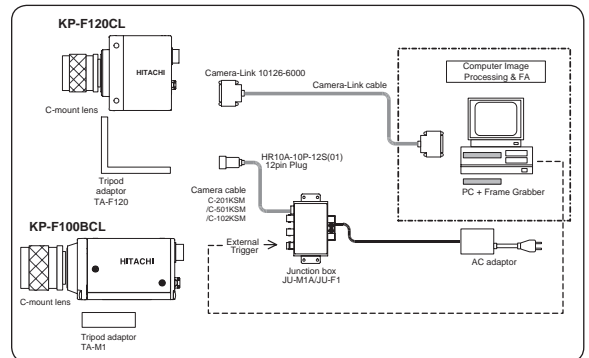
Frame on demand, partial scan, etc. by remote control or rear panel switch.

		KP-F200CL-S1	KP-F120CL	KP-F100BCL
				
Imaging device	Total pixels	1688 (H) x 1248 (V)	1432 (H) x 1050 (V)	
	Effective pixels	1628(H) x 1236 (V)	1392(H) x 1040 (V)	
	Pixel size	4.4 μm (H) x 4.4 μm (V) (square lattice)	6.45 μm (H) x 6.45 μm (V) (square lattice)	
Sensing area		8.5 mm (H) x 6.8 mm (V)	8.98 mm (H) x 6.71 mm (V)	
Aspect ratio		4 : 3		
Frame rate		30 frames per second (full pixel readout)		15 frames per second (full pixel readout)
Horizontal scanning frequency		37.5 kHz	32.07 kHz	16.0 kHz
Vertical scanning frequency		30 Hz		15 Hz
Sync system		Internal	Internal/external (HD/VD)	
Lens mount		C mount (Flange focal distance=17.526 mm)		
Video output		Digital output (CameraLink) Maximum cable length: 10m	Digital output (CameraLink) Maximum cable length: 10m or analog output for image checking	Digital output (CameraLink) 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)		1/30, 1/125, 1/250, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate: 1/15)
Gamma		γ = 1		
Frame on demand		ONE trigger mode	(A) Fixed shutter (8steps or variable) (B) ONE trigger mode (C) TWO trigger mode (D) Smear reduction mode (E) Partial scan mode	(A) Fixed shutter (8steps or variable) (B) ONE trigger mode (C) TWO trigger mode
Power supply voltage		12 ± 1 VDC		
Current consumption		Approx. 460 mA	Approx. 400 mA	Approx. 320 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		29.4m/s <sup>2</sup> , 10 to 200 Hz 30 minutes each on XYZ axes		
Shock endurance		294 m/s <sup>2</sup> (vertical, horizontal, once each face)		
External dimensions		58 (W) x 58 (H) x 48 (D) mm (Not including mount protrusions)		44 (W) x 44 (H) x 78 (D) mm (Not including mount protrusions)
Mass		Approx. 220 g		Approx. 180 g

**Dimensions**



**System configuration**



**Optional accessories**

- 12 pin plug
  - Junction box
  - Dummy glass (AR coated)
  - Camera Link Cable
  - Camera cable (Molded type)
  - Tripod adaptor
- HR10A-10P-12S(01)  
 JU-M1A/JU-F1  
 ARC1214  
 2m C-201KSM  
 5m C-501KSM  
 10m C-102KSM  
 KP-F200CL-S1/F120CL: TA-F120  
 KP-F100BCL: TA-M1

**Standard composition**

- Camera
- Operation instructions



Camera Link

1CCD Color

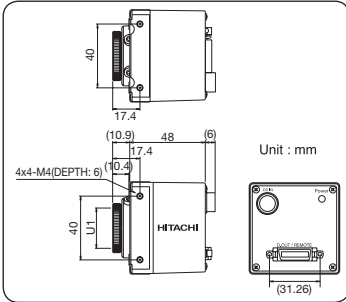
Progressive

**KP-FD30CL**

**Main Features**

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

**Dimensions**



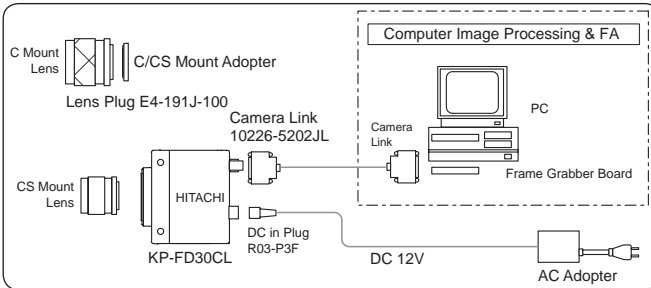
**Standard composition**

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

**Optional accessories**

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

**System configuration**



**KP-FD30CL**



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 (CameraLink) 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 (8steps 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	68.6m/s <sup>2</sup> (10 to 200Hz, 30 minutes each on XYZ axes)	
Shock endurance	490.3m/s <sup>2</sup> (vertical, horizontal, once each direction)	
External dimensions	58 (W) x 58 (H) x 48 (D) mm (Not including mount protrusions)	
Mass	Approx. 220 g	

Camera Link

3CCD Color

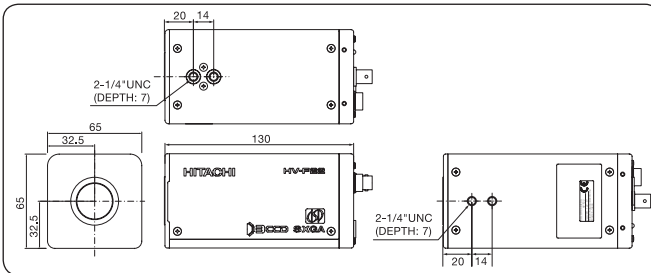
Progressive

**HV-F22CL, HV-F22CL-S1, HV-F31CL, HV-F31CL-S1**

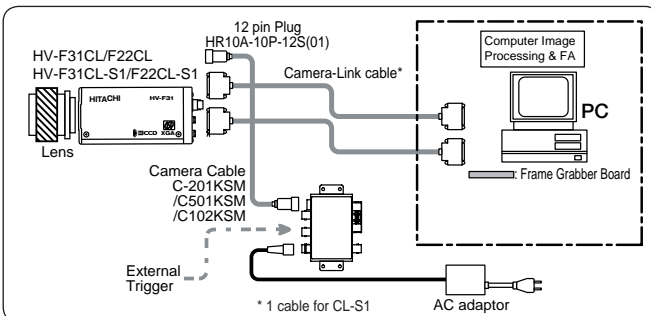
**Main Features**

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

**Dimensions**



**System configuration**



**HV-F22CL / F22CL-S1      HV-F31CL / F31CL-S1**



Imaging device	Total pixels	1392 (H) x 1050 (V)	1077 (H) x 788 (V)
	Effective pixels	1360(H) x 1024 (V)	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 auto selection)		
Lens mount	C mount (Flange focal distance = 17.526 mm)		
Video output	Digital output (CameraLink)		
	HV-F22CL/F31CL: 30bits (R: 8bit G: 8bit B: 8bit) (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	29.4m/s <sup>2</sup> , 10 to 200 Hz 30 minutes each on XYZ axes		
Shock endurance	490 m/s <sup>2</sup> (vertical, horizontal, once each face)		
External dimensions	65 (W) x 65 (H) x 130 (D) mm (Not including mount protrusions)		
Mass	Approx. 600 g		

**Standard composition**

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

**Optional accessories**

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

## KP-F120, KP-F100B

## Main Features

## High speed read out

Full pixel independent readout: 30 frames/second (KP-F120), 15 frames/second (KP-F100B).

Partial Scan (except KP-F100B): Read out up to over 190 frames/second max.

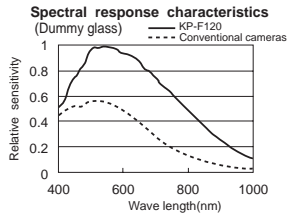
## High resolution

2/3-inch CCD.

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

## Near infrared sensitivity (KP-F120)

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



## Digital output

EIA-644

## Full frame shutter

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

## Multi step electronic shutter



8 steps electronic shutter up to 1/50000 second.

## Frame on demand

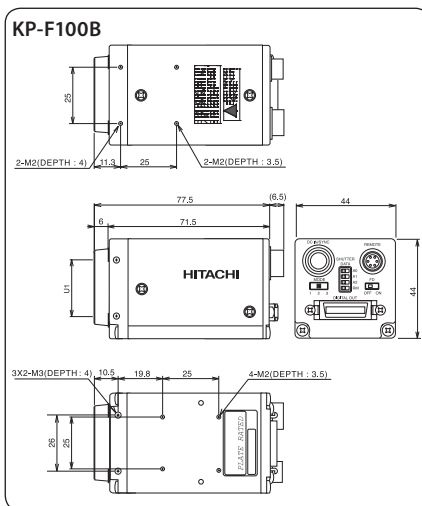
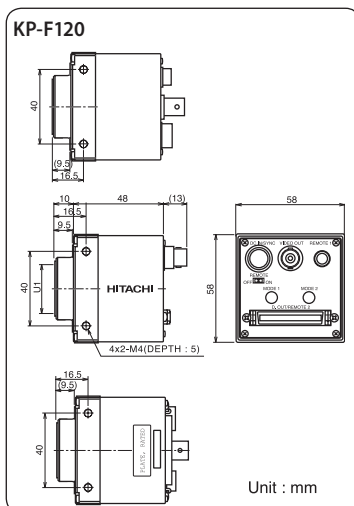
An external trigger signal input can be used to capture an image at a desired timing for instant view or processing.

## RS-232C control

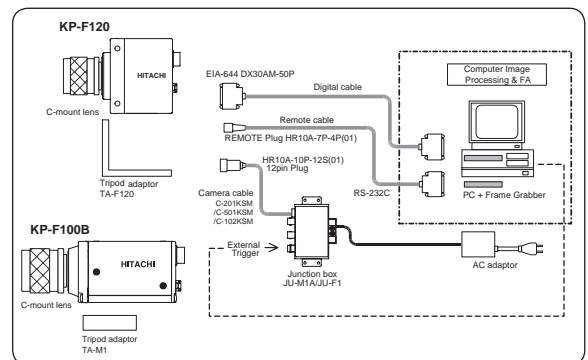
Frame on demand, partial scan, etc. by RS-232C control or rear panel switch.

		KP-F120	KP-F100B
			
		2/3-inch interline CCD	
Imaging device	Total pixels	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)	15 frames per second (full pixel readout)
Horizontal scanning frequency		32.07 kHz	16.0 kHz
Vertical scanning frequency		30 Hz	15 Hz
Sync system		Internal/external (HD/VD)	
Lens mount		C mount (Flange focal distance=17.526 mm)	
Video output		Digital output (EIA-644) Maximum cable length: 10m or analog output for image checking	Digital output (EIA-644) Maximum cable length: 10m or analog output for image checking
External sync input		HD/VD TTL 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)	1/30, 1/125, 1/250, 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 (8steps or variable) (B) ONE trigger mode (C) TWO trigger mode (D) Smear reduction mode (E) Partial scan mode	(A) Fixed shutter (8steps or variable) (B) ONE trigger mode (C) TWO trigger mode
Power supply voltage		12 ± 1 VDC	
Current consumption		Approx. 400 mA	Approx. 320 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		29.4m/s <sup>2</sup> , 10 to 200 Hz 30 minutes each on XYZ axes	
Shock endurance		294 m/s <sup>2</sup> (vertical, horizontal, once each face)	
External dimensions		58 (W) x 58 (H) x 48 (D) mm (Not including mount protrusions)	44 (W) x 44 (H) x 78 (D) mm (Not including mount protrusions)
Mass		Approx. 220 g	Approx. 180 g

## Dimensions



## System configuration



## Optional accessories

- 12 pin plug
  - Junction box
  - Dummy glass (AR coated)
  - Camera cable (Molded type)
  - Tripod adaptor
- HR10A-10P-12S(O1)  
JU-M1A/JU-F1  
ARC1214  
2m C-201KSM  
5m C-501KSM  
10m C-102KSM  
KP-F120: TA-F120  
KP-F100B: TA-M1

## Standard composition

- Camera
- Operation instructions

Analog

Black &amp; White

Progressive

## KP-F80, KP-F38, 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

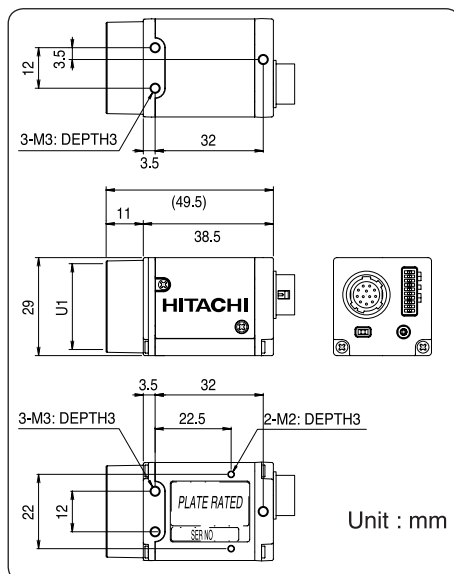
KP-F33: VGA (Effective: 659(H)x494(V)), 30 fps

KP-F38: VGA (Effective: 659(H)x494(V)), 80 fps

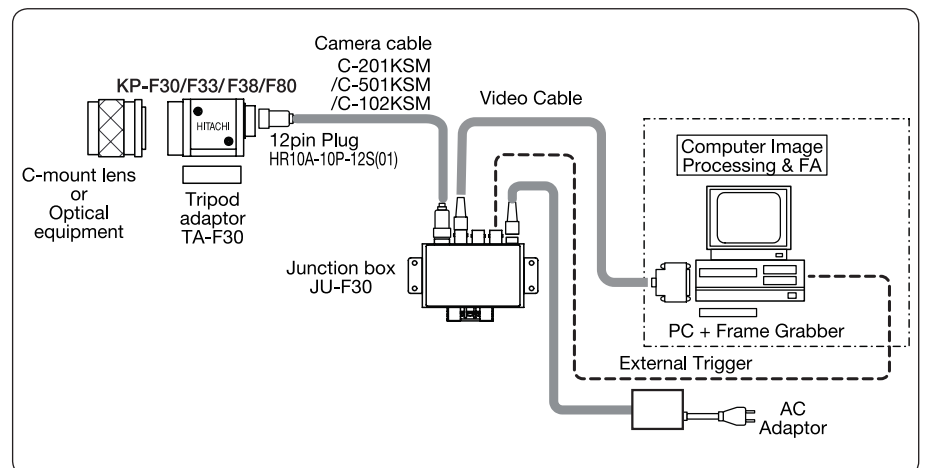
KP-F80: XGA (Effective: 1034(H) x 779(V)), 30 fps

	KP-F80	KP-F38	KP-F33	KP-F30
				
Imaging device	1/3-inch interline CCD			
Total pixels	1077 (H) x 788 (V)	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)	4.88 mm (H) x 3.66 mm (V)		
Aspect ratio	4 : 3			
Frame rate	30 frames per second	80 frames per second	30 frames per second	60 frames per second
Horizontal scanning frequency	23.622 kHz	41.958 kHz	15.734 kHz	31.468 kHz
Vertical scanning frequency	29.83 Hz	79.92 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)	700 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)	1.3 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)	1/330, 1/660, 1/1300, 1/2600, 1/5300, 1/30000, 1/66000 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. 2.3 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	98 m/s <sup>2</sup> (Acceleration: constant) 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes			
Shock endurance	686 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)			
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

## KP-M30, KP-M20



## Main Features

## Compact body

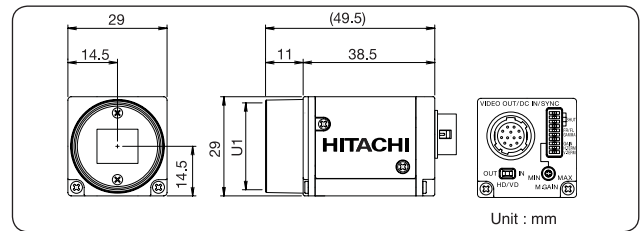
29 (W) X 29 (H) X 38.5 (D) mm

## High resolution &amp; high sensitivity

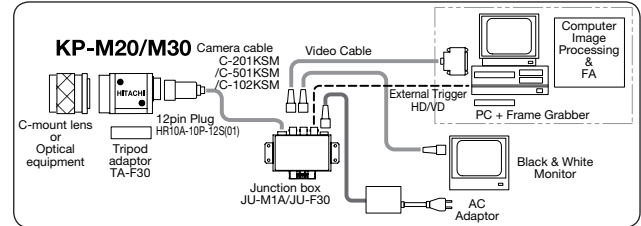
570 TV Line (horizontal), 0.3 lx (F1.4)

		KP-M30	KP-M20
			
		1/3-inch interline CCD	1/2-inch interline CCD
Imaging device	Total pixels	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)
	Effective pixels	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: 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. 1.4W	
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		98 m/s <sup>2</sup> (Acceleration: constant 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes)	
Shock endurance		686 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)	
External dimensions		29 (W) x 29 (H) x 38.5 (D) mm (Not including protrusions)	
Mass		Approx. 55 g	

## Dimensions



## 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

## KP-M1A, KP-M2A, KP-M3A, KP-M2R

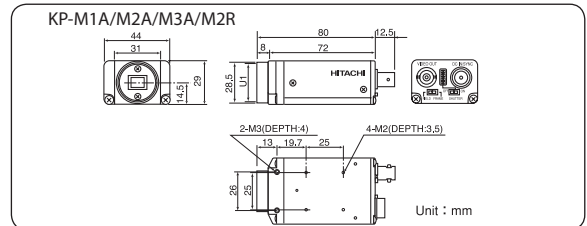
## Main Features

High sensitivity, high resolution and high performance  
Line up 2/3, 1/2, 1/3 inch CCD models

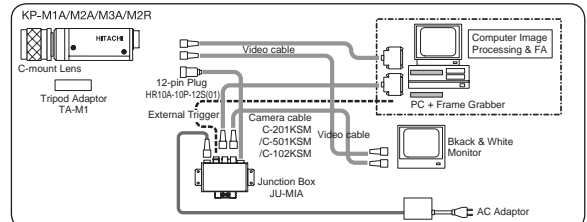
Near infrared sensitivity (KP-M2R)

		KP-M1A	KP-M2A/M2R	KP-M3A
				
		2/3-inch interline CCD	1/2-inch interline CCD	1/3-inch interline CCD
Imaging device	Total pixels	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)	EIA: 811 (H) x 508 (V) CCIR: 795 (H) x 596 (V)
	Effective pixels	EIA: 768 (H) x 494 (V) CCIR: 752 (H) x 582 (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: 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)	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. 1.4W		
Ambi-ent	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		98 m/s <sup>2</sup> (Acceleration: constant 10 to 200 Hz, sweep: 10 minutes, XYZ 30 minutes)		
Shock endurance		686 m/s <sup>2</sup> (Drop test, once each top, bottom, left and right)		
External dimensions		44 (W) x 29 (H) x 72 (D) mm		
Mass		Approx. 55 g		

## Dimensions



## 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

RGB/NTSC


1CCD Color

Progressive / Interace

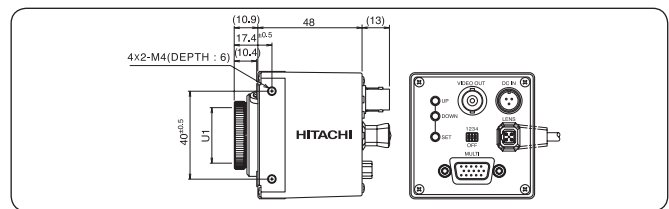
**KP-FD30, KP-FD30M**

**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.

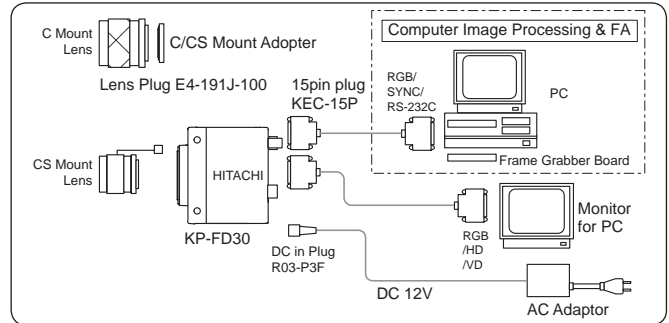
Suitable for the image-processing equipment input  
 Small lightweight size, RGB output and various image processing function.  
 NTSC output (only KP-FD30)  
 The still picture continuation output (only KP-FD30M)

		KP-FD30 / FD30M
		
Imaging device	Total pixels	1/2-inch interline CCD
	Effective pixels	692 (H) x 504 (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 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)
Horizontal resolution		440TV Line
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		68.65 m/s <sup>2</sup> (Acceleration: constant 10 to 200 Hz, XYZ 30 minutes)
Shock endurance		490.3 m/s <sup>2</sup> (vertical, horizontal, once each direction)
External dimensions		58 (W) x 58 (H) x 48 (D) mm (Not including protrusions)
Mass		Approx. 220 g

**Dimensions**



**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

NTSC/PAL



1CCD Color

Interace

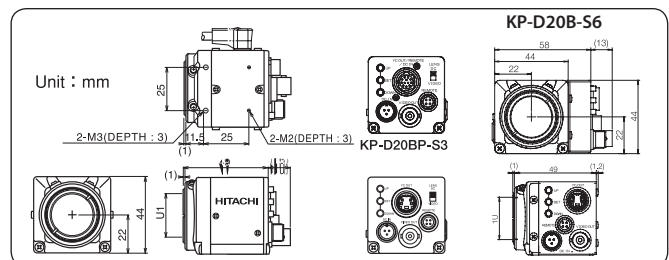
**KP-D20A, KP-D20B, KP-D20B-S6, KP-D20B-S3**

**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.

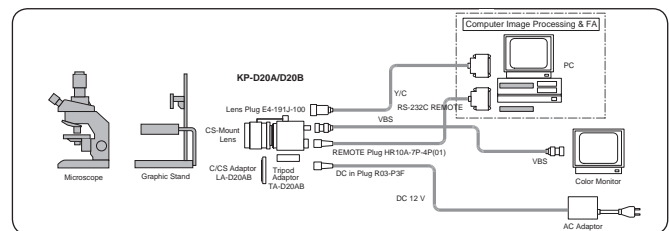
KP-D20B-S6 : Right angle type, only a DC type lens can be used for auto-iris.  
 KP-D20B-S3 : 12pin type, PAL type only

		KP-D20A	KP-D20B
			
		KP-D20A, KP-D20B, KP-D20B-S3	KP-D20B-S6
Imaging device	Total pixels	1/3-inch interline CCD	1/2-inch interline CCD
	Effective pixels	NTSC: 811 (H) x 596 (V), PAL: 795 (H) x 596 (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		29.42 m/s <sup>2</sup> (Acceleration: constant 10 to 55 Hz, XYZ 30 minutes)	
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

**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 (D20B-S3 only) HR10A-10R-12S(01)

NTSC/PAL

3CCD Color

Interlace

**HV-D27A, HV-D37A**

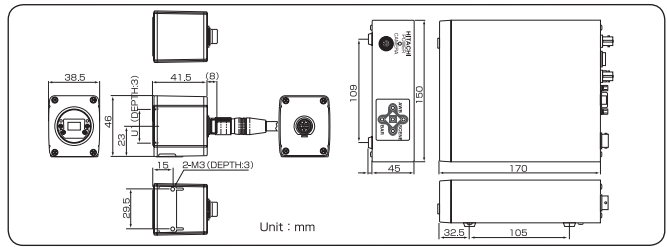
**Main Features**

3 CCD color camera featuring a very small remote head  
High picture quality and high stability by utilizing 14 bit digital signal processing (DSP)

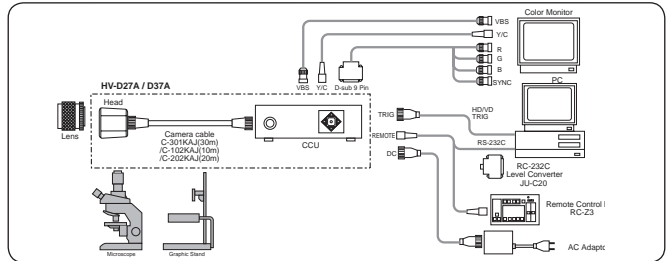
Auto Shading Compensation (ASC)  
External Trigger functions

	HV-D37A	HV-D27A
<b>Color system</b>	NTSC, PAL	
<b>Optical system</b>	1/3-inch, F1.6 prism	1/2-inch, F1.6 prism
<b>Imaging device</b>	Total pixels	1/3-inch interline CCD (R, G, B 3CCD)
	Effective pixels	1/2-inch interline CCD (R, G, B 3CCD)
	NTSC 811(H) x 508(V) PAL: 795(H) x 596(V)	
	NTSC 768(H) x 494(V) PAL: 752(H) x 582(V)	
<b>Sync system</b>	Internal/external (VBS, BBS or HD/VD auto selection)	
<b>Horizontal resolution</b>	800TV lines, luminance signal center (Y out and DTL off)	
<b>S/N</b>	NTSC: 62dB (DNR: ON) PAL: 60dB (DNR: ON)	
<b>Standard sensitivity</b>	2000 lx, F11	
<b>Minimum illumination</b>	1.4 lx (50IRE, F2.2, max. gain)	0.8 lx (50IRE, F1.6, max. gain)
<b>Gamma correction</b>	0.35 to 1.0 (ON/OFF)	
<b>Lens mount</b>	C mount (flange back 17.25mm in air)	
<b>Sensitivity selection</b>	AGC (0 to +20dB)	
<b>CCD drive functions</b>	<b>Preset</b>	1/100(1/60 PAL), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 second
	<b>Lockscan</b>	NTSC 1/60.38 to 1/251.5 second (step 1H), PAL 1/50.31 to 1/253.8 second (step 1H)
	<b>AES</b>	OFF to approx. 1/1000 second
	<b>Long time integration</b>	Frame/field integration selection
		1/30 (NTSC), 1/25 (PAL) to approx. 8 seconds (1frame step)
<b>Power supply voltage</b>	12 V rated (stable operation at 10.5 to 17 VDC (ripple and noise absent))	
<b>Power consumption</b>	Approx. 11.5W	
<b>Dimensions</b>	Head: 38.5(W)x46(H)x41.5(D)mm CCU: 150(W)x45(H)x170(D)mm	
<b>Mass</b>	Head: 90g approx. CCU: 950g approx.	
<b>Ambient temperature</b>	Operating -10 to +45°C (+14 to +113°F)	
	Storage -20 to +60°C (-4 to +140°F)	

**Dimensions**



**System configuration**



**Standard composition** **Optional accessories**

- Camera head
- CCU
- Camera cable
- Operation instructions
- Camera cable  
3m: C-301KAJ, 10m: C-102KAJ,  
20m: C-202KAJ, 4m+16m: C-401KAJ/C-162KAL
- Remote control box RC-Z3
- Level converter JU-C20
- Junction box JU-Z2

NTSC/PAL

3CCD Color

Interlace

**HV-D30, HV-D20**

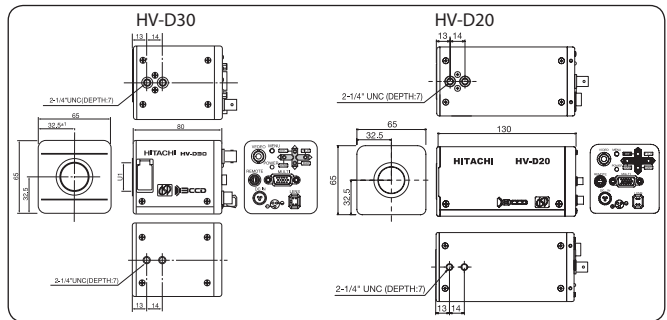
**Main Features**

Compact, high Performance, multi purpose cameras featuring  
12 bit A/D converters and a 3 million gate DSP  
High resolution of 800 TV lines

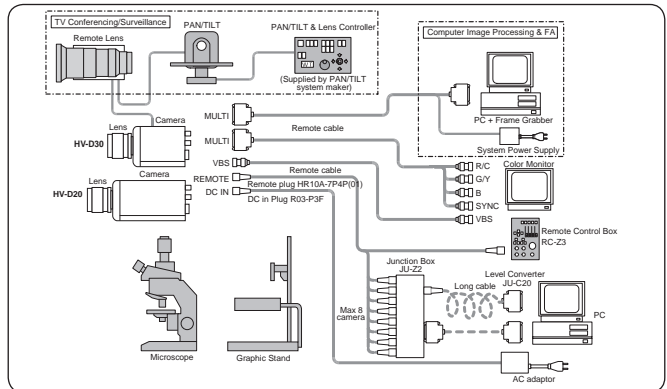
Auto Shading Compensation (ASC)  
External Trigger functions

	HV-D30	HV-D20
<b>Color system</b>	NTSC, PAL	PAL only
<b>Optical system</b>	1/3-inch, F2.2 prism	1/2-inch, F1.6 prism
<b>Imaging device</b>	Total pixels	1/3-inch interline CCD (R, G, B 3CCD)
	Effective pixels	1/2-inch interline CCD (R, G, B 3CCD)
	NTSC 811(H) x 508(V) PAL: 795(H) x 596(V)	
	NTSC 768(H) x 494(V) PAL: 752(H) x 582(V)	
<b>Sync system</b>	Internal/external (VBS, BBS or HD/VD auto selection)	
<b>Horizontal resolution</b>	800TV lines, luminance signal center (Y out and DTL off)	
<b>S/N</b>	NTSC: 64dB (DNR: ON), PAL: 62dB (DNR: ON)	
<b>Standard sensitivity</b>	2000lx, F9.5	2000lx, F11
<b>Minimum illumination</b>	0.9lx (50IRE, F2.2, GAIN: +24dB, DIGITAL GAIN: +12dB)	
<b>Gamma correction</b>	0.45/1.0 (ON/OFF)	
<b>Lens mount</b>	C mount (flange back 17.25mm in air)	
<b>Sensitivity selection</b>	AGC (0 to +24dB) or GAIN (0 to +24dB step 1dB or step 3dB on remote control menu)	
<b>CCD drive functions</b>	<b>Preset</b>	1/100(1/60 PAL), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/20000, 1/40000, 1/100000 second
	<b>Lockscan</b>	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)
	<b>Long time integration</b>	Frame/field integration selection 1/30 (NTSC), 1/25 (PAL) to approx. 8 seconds (1frame step)
<b>Power supply voltage</b>	12 V rated (stable operation at 10.5 to 15 VDC (ripple and noise absent))	
<b>Power consumption</b>	Approx. 4.5W	Approx. 5.0W
<b>Dimensions</b>	65(W)x65(H)x80(D)mm	65(W)x65(H)x130(D)mm
<b>Mass</b>	400g approx. (not including lens)	450g approx. (not including lens)
<b>Ambient temperature</b>	Operating -10 to +45°C (+14 to +113°F)	
	Storage -20 to +60°C (-4 to +140°F)	

**Dimensions**



**System configuration**



**Standard composition**

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

**Optional accessories**

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

NTSC

EM-CCD Color

Interlace

KP-DE500

**Main Features** 100 Times More Sensitive Than A Normal Camera

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

**Hitachi Technology Enables Superior Image Reproduction In Low Light Levels**

Thermoelectric cooling used on the EM-CCD to reduce the effects of dark current noise along with a new digital signal processor (DSP) that provides digital noise reduction of the luminous signal yields sharp clear pictures with a high S/N ratio.

NTSC

EM-CCD Black & White

Interlace


KP-E500

**Main Features** For Even Greater Sensitivity A Monochrome Version of the Camera is Available Allowing Use in Even Lower Light Levels

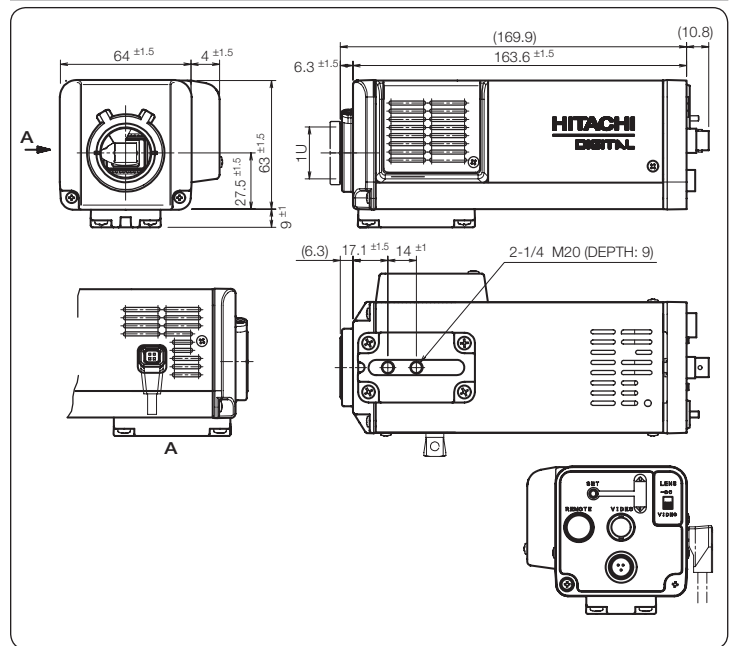
In the normal mode of operation the camera provides higher sensitivity as compared to a normal camera. In the accumulation mode unmatched sensitivity is achieved allowing use in extremely low light situations.  
 Monochrome in full motion mode 0.00003 lx  
 Monochrome accumulation mode 0.0000005 lx

**Electron Multiplication used in the EM-CCD Improves Performance While Reducing Technical Issues**

Typical high sensitivity cameras use an Image Intensifier Tube that is subject to burn in, afterimage (lag) and short life span. These problems are eliminated with the use of the EM-CCD.

	KP-DE500	KP-E500
		
Imaging device	1/2-inch interline EM-CCD	
	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 system	2 : 1 Interlace	
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	
Signal-processing system	Digital processing (Input 10 bit)	
Signal to noise ratio (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, maximum sensitivity setup, F1.2, 50 IRE) 0.00005 lx (Monochrome in full motion, maximum sensitivity setup, F1.2, 50 IRE) 0.000015 lx (Color 64 time accumulation, maximum sensitivity setup, F1.2, 50 IRE) 0.0000008 lx (Monochrome 64 time accumulation, maximum sensitivity setup, F1.2, 50 IRE)	0.00003 lx (Monochrome in full motion, maximum sensitivity setup, F1.2, 50 IRE) 0.0000005 lx (Monochrome 64 time accumulation, maximum sensitivity setup, F1.2, 50 IRE)
Sensitivity (Gain) setup	Auto or a manual (factory set-AUTO)	
Electronic 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 magnification setup	Auto or a fixed change is possible. (factory set-OFF) 2, 4, 6, 8, 10, 16, 32, 64 times	
Backlight compensation	An ON/OFF change is possible (factory set-OFF) Light-measurement area: Nine area to selection is possible.	
White balance control	ATW: The mode which follows automatically AWC: The mode which holds a white balance after an automatic setup MANUAL: They are red and the mode which carries out blue gain adjustment and unites a white with manual operation	—
B/W Mode	OFF: The mode of fixation on a color image On: In high sensitivity monochrome image mode AUTO: With luminous intensity OFF of high sensitivity monochrome image, the mode where ON changes automatically	—
DNR	Change of AUTO / MANU (8 steps) (factory set-AUTO)	
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 it is attached)	
Ambient, operating	-10 °C to +50 °C / 30 to 80% RH	
Ambient, storage	-20 °C to +60 °C / 20 to 90% RH	
Vibration endurance	24.5 m/s <sup>2</sup> (10 to 200Hz XYZ direction each 30 minute)	
External dimensions	78(W) x 63(H) x 170(D) mm	

**Dimensions**



**Standard composition**

- Camera
- Operation instructions
- DC plug

**HDTV (HD-SDI)****3CMOS Color****1080i / 720 p****HV-HD30****Main Features****Picture Quality**

Uses newly developed HDTV 1/3-inch, 1.3-Megapixel CMOS sensors to provide high-quality, smearless images.


**Compact and Lightweight**

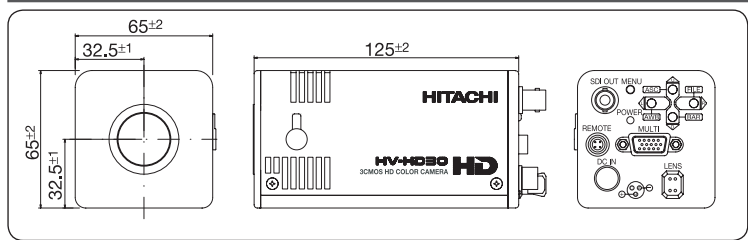
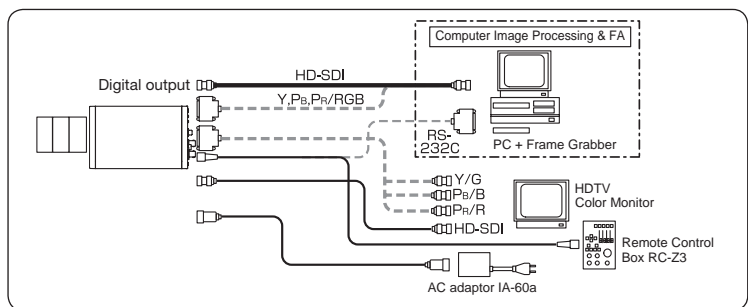
The camera itself weighs just 600g (without lens).

**Multi-Format Output**

By switching the operating mode, the output signal is switched between 1080i or 720P system HD-SDI video signals.

An RGB/YBPBR analog output (D-sub 15-pin) is also provided.

HV-HD30	
	
Scan Format	HDTV 1080i 59.94/50 or 720p 59.94/50
Imaging Device	1/3 inch 1.3 million pixels CMOS
Total Pixels	1312 (H) x 1032 (V)
Effective Pixels	1280 (H) x 720 (V)
Synchronization	Internal / External (Tri-level sync)
Lens Mount	C mount (Flange back: 17.526 mm in air)
Horizontal Resolution	720 TV Line
Sensitivity	2000 lx / F5.6
S/N	50 dB Typ (HD-SDI output decode, Y-channel, bandwidth: 30MHz)
High gain	0 to +12 dB, 1 dB step
Shutter	1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000 sec
Lock Scan	1/60 to 1/5600 (at 59.94 Hz), 1/50 to 1/4600 (at 50.00 Hz)
HD-SDI Output	1 system: SMPTE292M 1.5Gbps
Analog Output	1 system (D-sub15pin) : Component (Switchable RGB, YBPBR) Y, G: 1.0 Vp-p/75 Ω, Pb, Pr, R, B: 0.7 Vp-p/75 Ω
Power Supply	12 V DC (10.8 V to 14 V)
Power Consumption	Approx. 7 W
Dimensions	65(W) x 65(H) x 125(D) mm
Mass	Approx. 600g (Except lens)
Operation Temperature	-10 to +40 °C
Connector	HD-SDI output (BNC, 75Ω)x1, D-sub15 pin (Analog output, external 3-level sync) x1, Lens control, Serial control, DC power supply input

**Dimensions****System configuration****Standard composition**

- Camera
- Operation instructions

**Optional accessories**

- AC Adaptor IA-60a (I. D. X.)
- Remote Control Unit RC-Z3

**HDTV (HD-SDI)****3CCD Color****1080i****DK-H32****Main Features****High S/N with HD-SDI**

Outstanding Signal-to-noise ratio >54dB 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' outputs. Hitachi is leading developer for High performance CPU & DSP in Broadcast Fields. Hitachi's highest 0.18μm VLSIC processor with 3 million gates. 30-bit internal

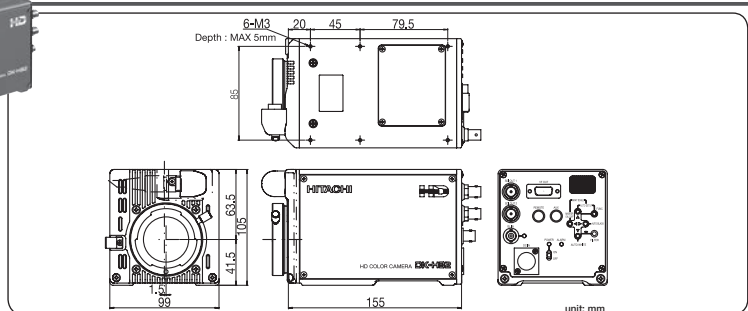
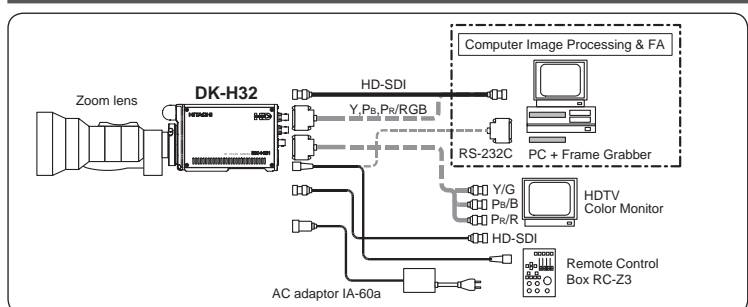
processing to provides high dynamic range with superb video stability, Maintenance Free

**High Resolution**

The three 2/3-inch 2.2million pixel CCDs with microlenses and digital signal processing deliver >1000 TV lines horizontal resolution (Y channel).

**Small & light weight head**

DK-H32	
	
CCD	2/3" 2.2 M pixels IT-CCD
Effective pixels	1920(H) x 1080(V)
Aspect ratio	16:9
Scan format	HDTV 1080/59.94i
Horizontal resolution	1000TV lines Y out
Standard sensitivity	2000 lx / F11
Minimum illumination	0.03 lx (F1.4, +18dB, Integration mode)
S/N	54 dB HD-SDI, Y: 30 MHz
Filter wheel	3200K, 5600K, 5600K+1/16ND, 5600K+1/64ND
Shutter	PRESET 1/100, 1/250, 1/500, 1/1000, 1/2000(S)
	Lock Scan 1/60.16 to 1/1985 s
	AES OFF to 1/1000 s
Power supply voltage	12 V DC
Power consumption	approx. 22 W
Dimensions (W x H x D)	99 mm x 105 mm x 155 mm
Mass	approx. 1.5 kg
Ambient temperature	operating 0 to +40 °C
	storage -20 to +60 °C
Input signals	Genlock (BNC connector) Tri-level sync 0.6 Vp-p +6dB, 75Ω
Output signals	HD-SDI 2 output (BNC connector) 0.8 Vp-p, 75Ω
Serial data input/output (4-pin connector) (internal switch)	Video output (monitor connector) (selection by menu) Y or G 1.0 Vp-p (with sync), 75Ω Pb or B 0.7 Vp-p, 75Ω, Pr or R 0.7 Vp-p, 75Ω Tri-level sync 0.6 Vp-p, 75Ω
	1.5 Vp-p +6 dB, high (RU-3300N), RS-232C (for Personal Computer)

**Dimensions****System configuration****Standard composition**

- Camera
- Operation instructions

**Optional accessories**

- AC Adaptor IA-60a (I. D. X.)
- Camera control panel RU-3300N



NTSC/PAL (SDI)

3CCD Color


Interlace

**HV-D15AS**

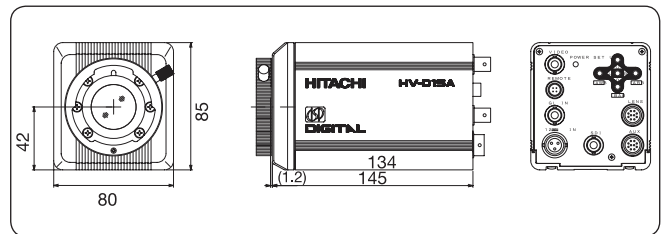
**Main Features**

Serial digital output (SDI) :  
 Serial digital OUTPUT is compliant with SMPTE 259M standard.  
**High picture quality**  
 High Sensitivity and High Resolution are achieved through the use of

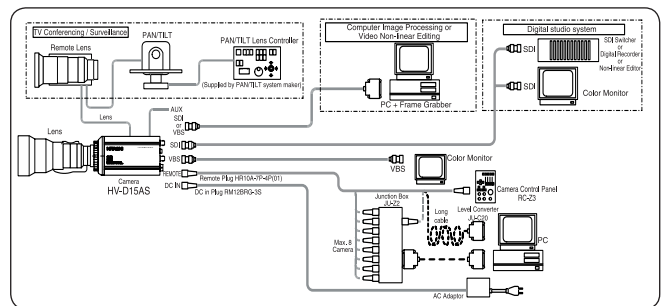
three 1/2 inch CCD's, each with 410,000 pixels (470,000 PAL). The 12-bit analog to digital (A/D) converters and 14-bit Double-locked DSP deliver horizontal resolution of 850TV lines and a high signal to noise ratio (S/N) of 65 dB (63 dB PAL) .

<b>HV-D15AS</b>		
		
Color system	NTSC, PAL	
Optical system	1/2-inch, F1.4 prism	
Imaging device	Total pixels	NTSC 811(H)X508(V) PAL 795(H)X596(V)
	Effective pixels	NTSC 768(H)X494(V) PAL 752(H)X582(V)
	Effective image area	NTSC 6.45(H)X4.84(V)mm PAL 6.47(H)X4.83(V)mm
Scanning frequency	NTSC: 15.735 KHz(H), 59.94 Hz(V), PAL: 15.624 KHz(H), 50.00 Hz(V)	
Sync system	Internal/external (VBS, BBS or HD/VD auto selection)	
Horizontal resolution	850 TV lines, luminance signal center (Y out and DTL off)	
S / N	NTSC : 65 dB type (DNR on), PAL : 63 dB type (DNR on)	
Standard sensitivity	2000 lx, F11	
Minimum illumination	0.3 lx (50 IRE, F1.4, GAIN +24 dB, DIGITAL GAIN +12 dB)	
Gamma	0.45 / 1.0 (on/off)	
Lens mount	Bayonet mount (flange back 35.74 mm in air)	
Electronic Shutter	Preset	1/100(1/60(PAL)), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10,000, 1/20,000, 1/40,000, 1/100,000 second
	Lockscan	NTSC: 1/60.38 to 1/2039 second (step 1H) to 1/100,000 second PAL: 1/50.31 to 1/2024 second (step 1H) to 1/100,000 second
	AES	Off to approx. 1/100,000 second (10 F stops of AES range)
Power supply voltage	12 V (10.5 to 15 V DC)	
Power consumption	Approx. 8.5 W	
Dimensions	80(W)X85(H)X134(D)mm	
Mass	Approx. 900 g	
Ambient temperature	Operating: -10 +45°C, Storage: -20 +60°C	
Input signal	Genlock	VBS 1.0 Vp-p ±3 dB or black burst/75 Ω or high (BNC)
	External trigger	Low 0 VDC, High 2 to 5 VDC
	Serial data	1.5 Vp-p ±3 dB / high or RS-232C level
Output signal	Component video	VBS 1.0 Vp-p/75 Ω
	SDI output	SMPTE 259M
	Serial data	1.5 Vp-p / Low or RS-232C level

**Dimensions**



**System configuration**



**Standard composition**

- Camera
- Power plug RM12BRG-3S
- Operation instructions

**Optional accessories**

- Remote control box RC-Z3
- Level converter JU-C20
- Junction box JU-Z2 (max. 8 cameras)

# Accessory list

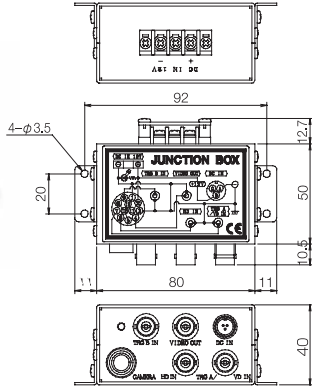
Interface		GigE Vision		IEEE 1394.b	IEEE 1394.a	PCL Type				SCL Type				Camera Link				Analog										
Model Name		KP-F140GV / F83GV / F33GV KP-FD140GV / FD83G / FD33GV		HV-F22GV-S2	KP-FD140F / FD32F KP-F140F / F83F / F32F	HV-F22F / F31F	KP-F500PCL / FR500PCL / FD500PCL KP-FD202PCL / FD140PCL	KP-F230PCL / FR230PCL KP-F31PCL / FR31PCL	KP-F200PCL / FR200PCL / 80PCL / R80PCL KP-F39PCL / FR39PCL / F30PCL / R30PCL	KP-FB30PCL / FBR30PCL	KP-F500SCL / FR500SCL KP-FD500SCL / FD202SCL / FD140SCL	KP-F230SCL / FR230SCL KP-F31SCL / FR31PCL	KP-F200SCL / FR200SCL / 80PCL / R80SCL KP-F39SCL / FR39SCL / F30SCL / R30SCL	KP-FB30SCL / FBR30PCL	KP-F200CL-S1 / F120CL	KP-F100BCL	KP-FD30CL	HV-F22CL / F22CL-S1 HV-F31CL / F31CL-S1	KP-F120	KP-F100B	KP-F80 / F38 / F33 / F30	KP-M30 / M20	KP-M1A / M2A / M3A / M2R	KP-FD30 / FD30M	KP-D20A / D20B / D20B-S3	HV-D27A / D37A	HV-D30 / D20	
Junction Box	JU-M1A																											
	JU-F1																											
	JU-Z2																											
	JU-F30							(*1)																				
Remote Control Box	RC-Z3																											
C/CS-mount Adaptor	LA-D20AB																											
Tripod Adaptor	TA-120																											
	TA-D20AB																											
	TA-F500																											
	TA-F230																											
	TA-F200S																											
	TA-F30																											
	TA-FB30/FB30P																											
	TA-FD140																											
Mini Camera-Link Cable SDR-MDR (for High Frequency)	(1m) C-101SCL																											
	(2m) C-201SCL																											
	(3m) C-301SCL																											
	(5m) C-501SCL																											
	(10m) C-102SCL																											
	(10m) C-102SCL (HF)																											
PoCL Cable SDR-SDR	(1m) C-101PCL (SS)																											
	(2m) C-201PCL (SS)																											
	(3m) C-301PCL (SS)																											
	(5m) C-501PCL (SS)																											
	(10m) C-102PCL (SS)																											
PoCL Cable SDR-MDR	(1m) C-101PCL (SM)																											
	(2m) C-201PCL (SM)																											
	(3m) C-301PCL (SM)																											
	(5m) C-501PCL (SM)																											
	(10m) C-102PCL (SM)																											
CameraLink 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)																								
IR Cut Filter	IRC650	(*5)	(*6)	(*5)	(*6)	(*4)	(*7)	(*4)	(*7)	(*4)	(*7)	(*4)	(*6)	(*6)														

(\*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-type camera.  
 (\*6) : IRC650 is equipped in the camera. (\*7) : ARC1214 is equipped in the F-type camera. IRC650 is equipped in the FR-type camera.

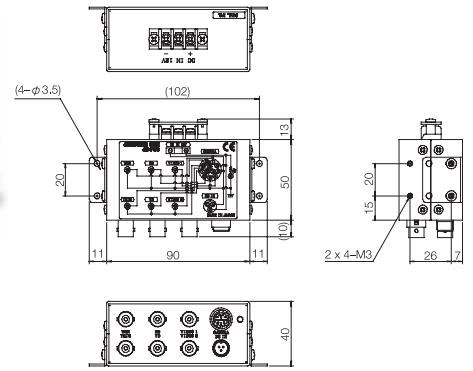
**Junction Box**

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

**JU-M1A**



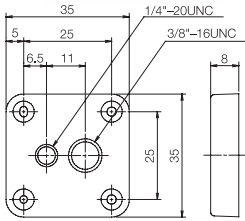
**JU-F30**



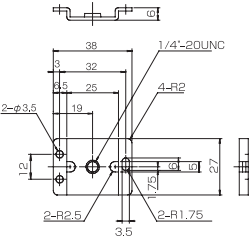
**Tripod Adaptor**

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

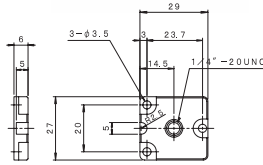
**TA-M1**



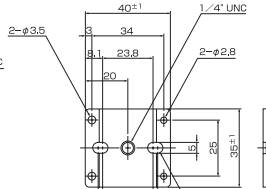
**TA-F30**



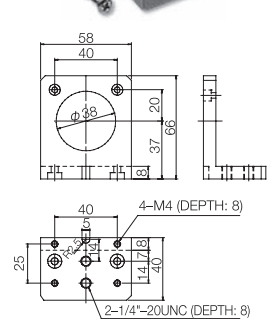
**TA-F200S**



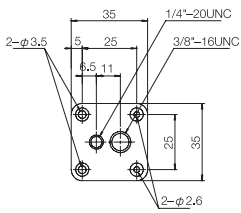
**TA-FD140**



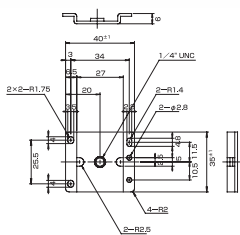
**TA-F120**



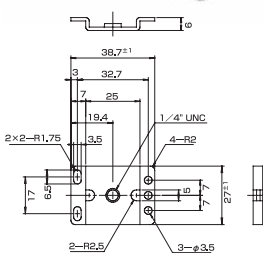
**TA-D20AB**



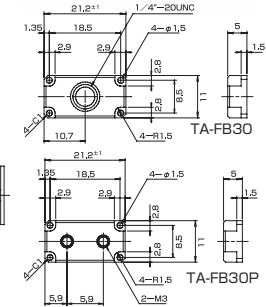
**TA-F500**



**TA-F230**



**TA-FB30 / FB30P**



**Camera Cable**

**C-201/501/102KSM**



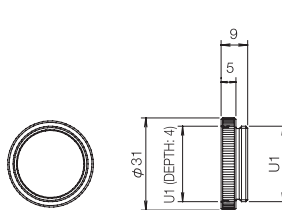
The camera cable is used for connecting camera and junction box. Supply 12VDC or external trigger signal to camera.

Molded type

- C-201KSM 2m
- C-501KSM 5m
- C-102KSM 10m

**C/CS Adaptor**

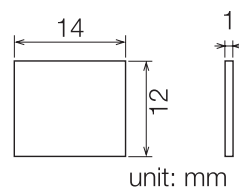
**LA-D20AB**



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

**Dummy Glass**

**ARC1214**



unit: mm

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





## List for Optional Lens

### FUJINON Co., Ltd.

	Supports megapixel camera		for 3CCD camera	
	Supports 5 megapixels	Supports 1.5 megapixels	Fixed Focal Lens	Auto Iris motorized zoom
<b>Model</b>	HF355A-1	HF16HA-1B	TF2.8DA-8	T16 x 5.5DA-M41
<b>Image Format</b>	2/3 type	2/3 type	1/3 type	1/3 type
<b>Focal Length</b>	35mm	16mm	2.8mm	5.5 to 88mm
<b>Maximum Relative Aperture</b>	F1.4	F1.4	F2.2	F1.4
<b>Iris range</b>	F1.4 to 22	F1.4 to 16	F2.2 to 16.C	F1.4 to 16
<b>Horizontal Angle of View</b>	14.20°	30.45°	89°08'	47.09 to 3.07°
<b>M.O.D.</b>	0.2m	0.1m	0.1m	1.0m
<b>Mount</b>	C	C	C	C
<b>Dimensions</b>	ø51 x 48.5mm	ø29.5 x 29.5mm	ø34 x 47.5mm	75 x 65 x 156mm
<b>Mass</b>	approx. 185g	approx. 45g	approx. 75g	approx. 900g

#### Technical Information

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



HF355A-1



TF2.8DA-8



T16 x 5.5DA-M41

### PENTAX CO., LTD.

	Supports megapixel camera			Manual Zoom lens
	H1214-M	C1614-M	C2514-M	H6Z810
<b>Model</b>	H1214-M	C1614-M	C2514-M	H6Z810
<b>Image Format</b>	1/2 type	2/3 type	2/3 type	1/3 type
<b>Focal Length</b>	12mm	16mm	25mm	8 to 48mm
<b>Maximum Relative Aperture</b>	F1.4	F1.4	F1.4	F1
<b>Iris range</b>	F1.4 to 16	F1.4 to 16	F1.4 to 16	F1 to F22
<b>Horizontal Angle of View</b>	28.91°	30.97°	20.00°	32.99 to 5.86°
<b>M.O.D.</b>	0.25m	0.25m	0.25m	1.2m
<b>Mount</b>	C	C	C	C
<b>Dimensions</b>	ø29.5x28.5mm	ø29.5x33.2mm	ø29.5x33.2mm	ø57 x 95mm
<b>Mass</b>	approx. 55g	approx. 63g	approx. 55g	approx. 430g

#### Technical Information

- **USA: PENTAX of America, INC.**  
TEL : +1-303-728-0225  
FAX : +1-303-728-0026  
Mail : [vhemingson@pentax.com](mailto:vhemingson@pentax.com)
- **EUROPE: PENTAX EUROPE GMBH**  
TEL : +49-40-561-92-109  
FAX : +49-40-561-92-334  
Mail : [cctv@pentax.de](mailto:cctv@pentax.de)



C1614-M



C2514-M



H6Z810

### TAMRON CO., LTD.

	Supports megapixel camera		
	23FM16SP	23FM25SP	23FM50SP
<b>Model</b>	23FM16SP	23FM25SP	23FM50SP
<b>Image Format</b>	2/3 type	2/3 type	2/3 type
<b>Focal Length</b>	16mm	25mm	50mm
<b>Maximum Relative Aperture</b>	F1.4	F1.4	F2.8
<b>Iris range</b>	F1.4 to 22	F1.4 to 22	F2.8 to 32
<b>Horizontal Angle of View</b>	30.9°	20.0°	10.1°
<b>M.O.D.</b>	0.15m	0.15m	0.2m
<b>Mount</b>	C	C	C
<b>Dimensions</b>	ø34x38mm	ø34x52.2mm	ø34x77.5mm
<b>Mass</b>	approx. 80g	approx. 103g	approx. 117g

#### Technical Information

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



23FM16SP



23FM25SP



23FM50SP

### CBC CO., LTD.

	Supports megapixel camera			
	Manual Iris	Vari-focal	Macro Zoom	
<b>Model</b>	M0814-MP	M1214-MP	M3Z1228C-MP	MLH-3XMP
<b>Image Format</b>	2/3 type	2/3 type	2/3 type	2/3 type
<b>Focal Length</b>	8mm	12mm	12 to 36mm	8.7 to 29.4mm
<b>Maximum Relative Aperture</b>	F1.4	F1.4	F2.8	F4.5
<b>Iris range</b>	F1.4 to 16C	F1.4 to 16C	F2.8 to 16C	F4.5 to 22C
<b>Horizontal Angle of View</b>	56.3°	40.4°	41.0 to 13.6°	11.8 to 2.78°
<b>M.O.D.</b>	0.1m	0.15m	0.2m	0.09m
<b>Mount</b>	C	C	C	C
<b>Dimensions</b>	ø33.5x28.2mm	ø33.5x28.2mm	ø41.6x53mm	ø36.5x79.5mm
<b>Mass</b>	approx. 70g	approx. 65g	approx. 105g	approx. 150g

#### Technical Information

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



M0814-MP



M1214-MP



M3Z1228C-MP



MLM-3XMP

### MIKAMI & CO., LTD.

	Manual Zoom lens for 3CCD camera	
	PH6X8 MACRO	J6x11 MACRO
<b>Model</b>	PH6X8 MACRO	J6x11 MACRO
<b>Image Format</b>	1/3 type	2/3 type
<b>Focal Length</b>	8 to 48mm	11.5 to 69 mm
<b>Maximum Relative Aperture</b>	F1.0	F1.4
<b>Iris range</b>	F1.0 to Close	F1.4 to C bse
<b>Horizontal Angle of View</b>	33.40 to 5.72°	41.9 to 7.3°
<b>M.O.D.</b>	1m Macro 1cm	1.0m
<b>Mount</b>	C	C
<b>Dimensions</b>	ø50.5x92.8mm	ø49.3x98.2mm
<b>Mass</b>	approx. 280g	approx. 410g

#### Technical Information

- **MIKAMI & CO., LTD.**  
URL : [www.kk-mikami.co.jp](http://www.kk-mikami.co.jp)  
TEL : +81-45-914-8222  
FAX : +81-45-914-6831



### Kowa Company Ltd.

	Lens for 3CCD camera					
	LM4NC3	LM6NC3	LM12NC3	LM25NC3	LM50NC3	
<b>Model</b>	LM4NC3	LM6NC3	LM12NC3	LM25NC3	LM50NC3	
<b>Image Format</b>	1/2 type					
<b>Focal Length</b>	4mm	6mm	12mm	25mm	50mm	
<b>Maximum Relative Aperture</b>	F1.8					
<b>Iris range</b>	F1.8 to 16					
<b>Horizontal Angle of View</b>	1/2"	83.4°	58.8°	30.4°	14.6°	7.0°
	1/3"	64.5°	44.9°	22.8°	11.0°	5.3°
<b>M.O.D.</b>	0.1m	0.1m	0.15m	0.2m	0.3m	
<b>Mount</b>	C					
<b>Dimensions</b>	ø34 x 66.3mm	ø30 x 62.7mm	ø30 x 58.5mm	ø30 x 47mm	ø40 x 66mm	
<b>Mass</b>	approx. 111g	approx. 99g	approx. 90g	approx. 75g	approx. 50g	

#### Technical Information

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



LM4NC3



LM6NC3



LM12NC3



LM25NC3



LM50NC3

## INDEX

ARC1214	Dummy Glass	26p	KP-F230SCL	Mini CameraLink, 1/1.8", UXGA/30 fps, Black & White, Progressive	9p
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C-101PCL (SS)	PoCL Cable SDR-SDR (1m)	14p	KP-F30PCL	Power over CameraLink, 1/3", VGA/60 fps, Black & White, Progressive	10p
C-101SCL	Mini CameraLink Cable SDR-MDR (1m)	14p	KP-F30SCL	Mini CameraLink, 1/3", VGA/60 fps, Black & White, Progressive	10p
C-102CL	CameraLink Cable (10m)	25p	KP-F31PCL	Power over CameraLink, 1/3", VGA/120 fps, Black & White, Progressive	9p
C-102KAJ	Camera Cable (10m) for HV-D27A/D37A	29p	KP-F31SCL	Mini CameraLink, 1/3", VGA/120 fps, Black & White, Progressive	9p
C-102KSM	Camera Cable (10m)	25p	KP-F32F	IEEE1394.b, 1/2", VGA/60 fps, Black & White, Progressive	7p
C-102PCL (HF)	Mini CameraLink Cable SDR-MDR for High Frequency (10m)	14p	KP-F33	Analog, 1/3", VGA/30 fps, Black & White, Progressive	18p
C-102PCL (SM)	PoCL Cable SDR-MDR (10m)	14p	KP-F33GV	GigE Vision, 1/3", VGA/90 fps, Black & White, Progressive	3p
C-102PCL (SS)	PoCL Cable SDR-SDR (10m)	14p	KP-F38	Analog, 1/3", VGA/80fps, Black & White, Progressive	18p
C-102RR	RGB Cable (10m)	25p	KP-F39PCL	Power over CameraLink, 1/3", VGA/91 fps, Black & White, Progressive	10p
C-102SCL	Mini CameraLink Cable SDR-MDR (10m)	14p	KP-F39SCL	Mini CameraLink, 1/3", VGA/91 fps, Black & White, Progressive	10p
C-201CL	CameraLink Cable (2m)	25p	KP-F500PCL	Power over CameraLink, 2/3", 5M pixel/16 fps, Black & White, Progressive	9p
C-201KSM	Camera Cable (2m)	26p	KP-F500SCL	Mini CameraLink, 2/3", 5M pixel/16 fps, Black & White, Progressive	9p
C-201PCL (SM)	PoCL Cable SDR-MDR (2m)	14p	KP-F80	Analog, 1/3", XGA/30 fps, Black & White, Progressive	18p
C-201PCL (SS)	PoCL Cable SDR-SDR (2m)	14p	KP-F80PCL	Power over CameraLink, 1/3", XGA/36 fps, Black & White, Progressive	10p
C-201SCL	Mini CameraLink Cable SDR-MDR (2m)	14p	KP-F80SCL	Mini CameraLink, 1/3", XGA/36 fps, Black & White, Progressive	10p
C-202KAJ	Camera Cable (20m) for HV-D27A/D37A	25p	KP-F83F	IEEE1394.b, 1/3", XGA/30 fps, Black & White, Progressive	7p
C-301CL	CameraLink Cable (3m)	25p	KP-F83GV	GigE Vision, 1/3", XGA/36 fps, Black & White, Progressive	3p
C-301KAJ	Camera Cable (3m) for HV-D27A/D37A	25p	KP-FB30PCL	Power over CameraLink, 1/3", VGA/60 fps, Black & White, Progressive, Separate type	9p
C-301PCL (SM)	PoCL Cable SDR-MDR (3m)	14p	KP-FB30SCL	Mini CameraLink, 1/3", VGA/60 fps, Black & White, Progressive, Separate type	9p
C-301PCL (SS)	PoCL Cable SDR-SDR (3m)	14p	KP-FBR30PCL	Power over CameraLink, 1/3", VGA/60 fps, RAW, Progressive, Separate type	11p
C-301SCL	Mini CameraLink Cable SDR-MDR (3m)	14p	KP-FBR30SCL	Mini CameraLink, 1/3", VGA/60 fps, RAW, Progressive, Separate type	11p
C-501CL	CameraLink Cable (5m)	25p	KP-FD140F	IEEE1394.b, 1/2", SXGA/15 fps, 1CCD color, Progressive	7p
C-501KSM	Camera Cable (5m)	26p	KP-FD140GV	GigE Vision, 1/2", SXGA/30 fps, 1CCD color, Progressive	4p
C-501PCL (SM)	PoCL Cable SDR-MDR (5m)	14p	KP-FD140PCL	Power over CameraLink, 1/1.8", SXGA/30 fps, 1CCD color, Progressive	13p
C-501PCL (SS)	PoCL Cable SDR-SDR (5m)	14p	KP-FD140SCL	Mini CameraLink, 1/1.8", SXGA/30 fps, 1CCD color, Progressive	13p
C-501RR	RGB Cable (5m)	25p	KP-FD202PCL	Power over CameraLink, 1/1.8", UXGA/30 fps, 1CCD color, Progressive	13p
C-501SCL	Mini CameraLink Cable SDR-MDR (5m)	14p	KP-FD202SCL	Mini CameraLink, 1/1.8", UXGA/30 fps, 1CCD color, Progressive	13p
DK-H32	HDTV (HD-SDI), 3CCD color, 1080i	23p	KP-FD30	RGB/NTSC, 1/2", 1CCD color	20p
E4-191J-100	Lens Plug	25p	KP-FD30CL	CameraLink, 1/1.8", VGA/60 fps, 1CCD color, Progressive	16p
HR10A-10P-12S	12 Pin Plug	25p	KP-FD30M	RGB, 1/2", 1CCD color, Still picture continuation output	20p
HR10A-7P-4P	4pin Plug	25p	KP-FD32F	IEEE1394.b, 1/2", VGA/60 fps, 1CCD color, Progressive	7p
HR10A-7P-6P	6pin Plug	25p	KP-FD33GV	GigE Vision, 1/3", VGA/90 fps, 1CCD color, Progressive	4p
HV-D15AS	NTSC/PAL, SDI output, 3CCD color	24p	KP-FD500PCL	Power over CameraLink, 2/3", 5M pixel/12 fps, 1CCD color, Progressive	13p
HV-D20	PAL, 1/2", 3CCD color	21p	KP-FD500SCL	Mini CameraLink, 2/3", 5M pixel/12 fps, 1CCD color, Progressive	13p
HV-D27A	NTSC/PAL, 1/2", 3CCD color, Separate head	21p	KP-FD83GV	GigE Vision, 1/3", XGA/36 fps, 1CCD color, Progressive	4p
HV-D30	NTSC/PAL, 1/3", 3CCD color	21p	KP-FR200PCL	Power over CameraLink, 1/1.8", UXGA/15 fps, RAW, Progressive	12p
HV-D37A	NTSC/PAL, 1/3", 3CCD color, Separate head	21p	KP-FR200SCL	Mini CameraLink, 1/1.8", UXGA/15 fps, RAW, Progressive	12p
HV-F22CL	CameraLink, 1/2", SXGA/15 fps, 3CCD color, 30 bit. Progressive	16p	KP-FR230PCL	Power over CameraLink, 1/1.8", UXGA/30 fps, RAW, Progressive	11p
HV-F22CL-S1	CameraLink, 1/2", SXGA/15 fps, 3CCD color, 24 bit. Progressive	16p	KP-FR230SCL	Mini CameraLink, 1/1.8", UXGA/30 fps, RAW, Progressive	11p
HV-F22F	IEEE1394.a, 1/2", SXGA/7.5 fps, 3CCD color, Progressive	8p	KP-FR30PCL	Power over CameraLink, 1/3", VGA/60 fps, RAW, Progressive	12p
HV-F22GV	GigE Vision, 1/2", SXGA/15 fps, 3CCD color, Progressive	5p	KP-FR30SCL	Mini CameraLink, 1/3", VGA/60 fps, RAW, Progressive	12p
HV-F22GV-S2	GigE Vision, 1/2", SXGA/15 fps, 3CCD color, Progressive	5p	KP-FR31PCL	Power over CameraLink, 1/3", VGA/120 fps, RAW, Progressive	11p
HV-F31CL	CameraLink, 1/3", XGA/30 fps, 3CCD color, 30 bit. Progressive	16p	KP-FR31SCL	Mini CameraLink, 1/3", VGA/120 fps, RAW, Progressive	11p
HV-F31CL-S1	CameraLink, 1/3", XGA/30 fps, 3CCD color, 24 bit. Progressive	16p	KP-FR39PCL	Power over CameraLink, 1/3", VGA/91 fps, RAW, Progressive	12p
HV-F31F	IEEE1394.a, 1/3", XGA/7.5 fps, 3CCD color, Progressive	8p	KP-FR39SCL	Mini CameraLink, 1/3", VGA/91 fps, RAW, Progressive	12p
HV-HD30	HDTV (HD-SDI), 3CMOS color, 1080i/720p	23p	KP-FR500PCL	Power over CameraLink, 2/3, 5M pixel/16 fps, RAW, Progressive	11p
IRC650	IR Cut Filter	25p	KP-FR500SCL	Mini CameraLink, 2/3", 5M pixel/16 fps, RAW, Progressive	11p
JU-F1	Junction Box	25p	KP-FR80PCL	Power over CameraLink, 1/3", XGA/36 fps, RAW, Progressive	12p
JU-F30	Junction Box	26p	KP-FR80SCL	Mini CameraLink, 1/3", XGA/36 fps, RAW, Progressive	12p
JU-M1A	Junction Box	26p	KP-M1A	EIA/CCIR, 2/3", Black & White, Interace	19p
JU-Z2	Junction Box	25p	KP-M20	EIA/CCIR, 1/2", Black & White, Interace	19p
KEC-15P	15 pin Plug	25p	KP-M2A	EIA/CCIR, 1/2", Black & White, Interace	19p
KP-D20A	NTSC/PAL, 1/3", 1CCD color	20p	KP-M2R	EIA/CCIR, 1/2", Black & White, Interace, IR	19p
KP-D20B	NTSC/PAL, 1/2", 1CCD color	20p	KP-M30	EIA/CCIR, 1/3", Black & White, Interace	19p
KP-D20B-S3	PAL, 1/2", 1CCD color, 12pin type	20p	KP-M3A	EIA/CCIR, 1/3", Black & White, Interace	19p
KP-D20B-S6	NTSC/PAL, 1/2", 1CCD color, Right angle type	20p	LA-D20AB	C/CS-mount Adaptor	26p
KP-DE500	NTSC, EM-CCD Color	22p	R03-P3F	DC Plug	25p
KP-E500	NTSC, EM-CCD Black & White	22p	RC-Z3	Remote Control Box	29p
KP-F100B	EIA-644, 2/3", SXGA/15 fps, Black & White, Progressive	17p	TA-F120	Tripod Adaptor	26p
KP-F100BCL	CameraLink, 2/3", SXGA/15 fps, Black & White, Progressive	15p	TA-D20AB	Tripod Adaptor	26p
KP-F120	EIA-644, 2/3", SXGA/30 fps, Black & White, Progressive	17p	TA-F200S	Tripod Adaptor	26p
KP-F120CL	CameraLink, 2/3", SXGA/30 fps, Black & White, Progressive	15p	TA-F230	Tripod Adaptor	26p
KP-F140F	IEEE1394.b, 1/2", SXGA/15 fps, Black & White, Progressive	7p	TA-F30	Tripod Adaptor	26p
KP-F140GV	GigE Vision, 1/2", SXGA/30 fps, Black & White, Progressive	3p	TA-F500	Tripod Adaptor	26p
KP-F200CL-S1	CameraLink, 1/1.8", UXGA/30 fps, Black & White, Progressive	15p	TA-FB30	Tripod Adaptor	26p
KP-F200PCL	Power over CameraLink, 1/1.8", UXGA/15 fps, Black & White, Progressive	10p	TA-FB30P	Tripod Adaptor	26p
KP-F200SCL	Mini CameraLink, 1/1.8", UXGA/15 fps, Black & White, Progressive	10p	TA-FD140	Tripod Adaptor	26p
KP-F230PCL	Power over CameraLink, 1/1.8", UXGA/30 fps, Black & White, Progressive	9p	TA-M1	Tripod Adaptor	26p

# Hitachi Industrial Progressive Scan Camera Line-up

Frame rate	Image Size				
	VGA	XGA	SXGA	UXGA	5.0M
120fps	(RAW) KP-FR31PCL/SCL (B/W) KP-F31PCL/SCL	<b>GigE Vision Series KP-FD type can be select the output image format (RGB/ YUV/RAW/MONO)</b> (3CCD) : 3CCD output (RGB) : RGB Output (RAW) : RAW Data Output (B/W) : Monochrome Output			
91fps	(RAW) KP-FR39PCL/SCL (B/W) KP-F39PCL/SCL				
90fps	(RGB) KP-FD33GV (B/W) KP-F33GV				
60fps	(RGB) KP-FD32F (RAW) KP-FR30PCL/SCL (RAW) KP-FBR30PCL/SCL (B/W) KP-F30PCL/SCL (B/W) KP-F32F (B/W) KP-FB30PCL/SCL	(3CMOS)HDTV 720P (920K) HV-HD30			
36fps		(RGB) KP-FD83GV (B/W) KP-F80PCL/SCL (B/W) KP-F83GV (RAW) KP-FR80PCL/SCL			
30fps		(3CCD)HV-F31CL (B/W) KP-F83F	(RGB) KP-FD140GV (RGB) KP-FD140PCL/SCL (B/W) KP-F140GV	(RGB) KP-FD202PCL/SCL (RAW) KP-FR230PCL/SCL (B/W) KP-F230PCL/SCL	
16fps					(RAW) KP-FR500PCL/SCL (B/W) KP-F500PCL/SCL
15fps		(3CCD)HV-F31F	(3CCD)HV-F22GV / -S2 (3CCD)HV-F22CL (RGB) KP-FD140F (B/W) KP-F140F	(RAW) KP-FR200PCL/SCL (B/W) KP-F200PCL/SCL	
12fps					(RGB) KP-FD500PCL/SCL
7.5fps			(3CCD)HV-F22F		

GV : GigE Vision  
 F : IEEE1394.a/b  
 PCL : Power over Camera Link  
 SCL : Mini Camera Link  
 CL : Camera Link



KP-FD500/FR500/F500P(S)CL  
 KP-FD202/FD140P(S)CL  
 44x44x41mm



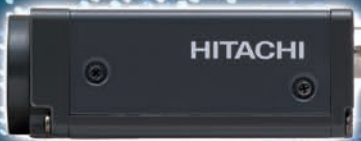
KP-FR200/F200P(S)CL  
 KP-FR80/F80P(S)CL  
 KP-FR39/F390P(S)CL  
 KP-FR30/F30P(S)CL  
 29x29x29mm



KP-FR230/F230P(S)CL  
 KP-FR31/F31P(S)CL  
 29x29x38mm



KP-FBR30/FB30P(S)CL  
 Head 12x12.5x47.5mm  
 CCU 29x29x38mm



KP-FD140/F140GV  
 KP-FD83/F83GV  
 KP-FD33/F33GV  
 44x29x72mm



HV-F22GV / -S2  
 65x65x141mm  
 HV-F22/F31CL  
 HV-F22/F31F  
 65x65x130mm

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

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These Specifications are subject to change without notice.

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