

Progressive Scan Industrial Camera Series Featuring GigE Vision Interface

GigE Vision

Cameras for Industries



Gigabit Ethernet

High speed (1Gbps) & long distance (100m) transfer

Available PoE (Power over Ethernet) Power Supply

Compatible with GigE Vision™ & GENiCAM™

Color Cameras

KP-FD140GV SXGA, 30fps

KP-FD83GV XGA, 36fps

KP-FD33GV VGA, 90fps

Black & White Cameras

KP-F140GV SXGA, 30fps

KP-F83GV XGA, 36fps

KP-F33GV VGA, 90fps



Actual Size

3CCD Color Camera

HV-F22GV SXGA, 15fps

Actual Size



GigE Vision — feature of an interface

Speed: 1Gbps Distance: 100m



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.

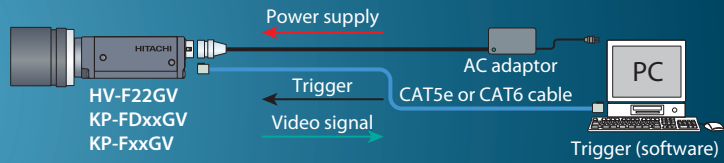
GENiCAM™ (Ver 1.00) compatible

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

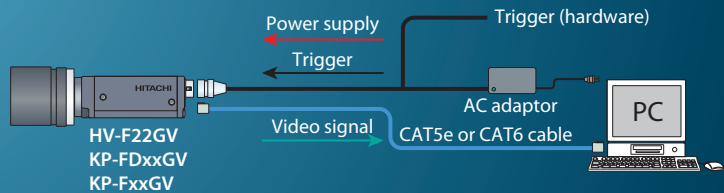
PoE correspondence (except HV-F22GV)

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

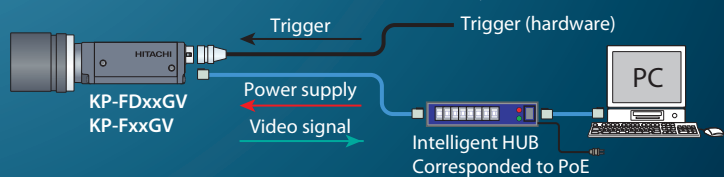
Direct connection to PC and triggered via Ethernet (software trigger)



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



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



Specifications

		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	656(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
		550 lx, F4, 3200K	400 lx, F2.8, 3200K	2000 lx, F11, 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	5Vp-p ±1 V		
External sync signal	VD output	5Vp-p ±0.3 V		
	Strobe out	5Vp-p ±0.3 V		
Binning mode	OFF / ON			
Partial scan	Grabbing image area is adjustable at 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. 4.0 W (DC+12 V)			
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 ² 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 ² 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 5 or Category 6)			

1CCD Black & White / Color Models

High resolution & High Frame rate

Model	CCD	Effective pixels	Frame rate
Color (1CCD, RGB/YUV/RAW/MONO)			
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
Black & White (MONO)			
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)

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

Specifications

		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	656(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)x4.65 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	640(H) x 480(V)	1024(H) x 768(V)	1360(H) x 1024(V)
	Frame rate	90 frames per second *Frame rate is different for following format	36 frames per second	30 frames per second
		RGB 12bit: 85 frames per second	RGB 12bit: 33 frames per second	RGB 8bit: 28 frames per second RGB 10bit: 22 frames per second RGB 12bit: 18 frames per second YUV 12bit: 28 frames per second
Sensitivity		2000 lx, F4, 3200K	2000 lx, F4, 3200K	2000 lx, F5.6, 3200K
Electric shutter speed	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)		
External sync signal	Input level	5 Vp-p ±1 V		
	VD output	5 Vp-p ±0.3 V		
Partial scan	Strobe out	5 Vp-p ±0.3 V		
		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. 4.5 W (DC+12 V)		
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 ² 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 ² 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 5 or Category 6)		



Lens: option

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.

3CCD Color Model

HV-F22GV 1/2, 1360 (H) x 1024 (V), 15 fps

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

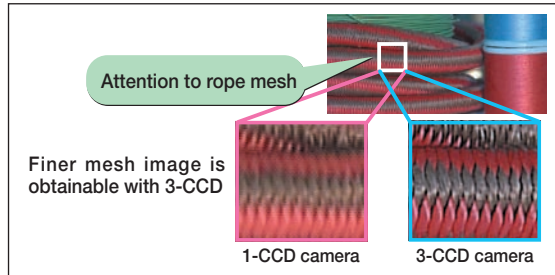
The single chip 3 million gates 0.18µm DSP design reduces the size, power consumption and greatly enhances stability. The 12 bit A/D converter and 14bit DSP processing provide a high S/N ratio and wide dynamic range.



Lens: option

High color fidelity and resolution

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



Attention to rope mesh

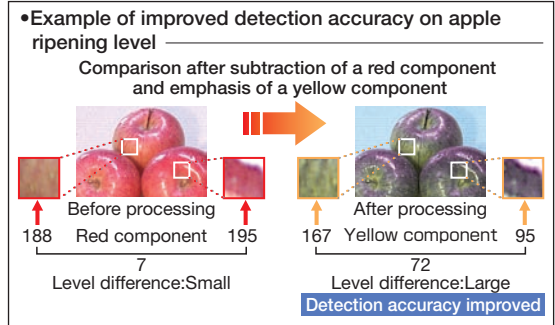
Finer mesh image is obtainable with 3-CCD

1-CCD camera

3-CCD camera

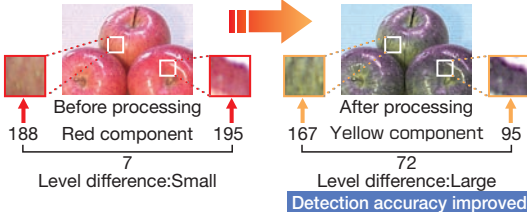
6 color independent masking

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



• Example of improved detection accuracy on apple ripening level

Comparison after subtraction of a red component and emphasis of a yellow component



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

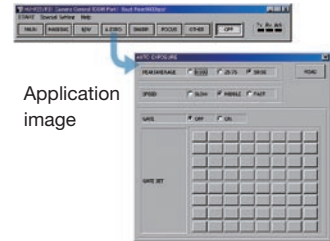
- Provides 4 application file
- Realtime automatic white balance function (ATW)
- Automatic Exposure (ALC)(Automatic level control) (Digital light measuring utilized a scene in to 64 divided sensing areas)
- Focus data output (serial data)
- 2 mode gain control(AGC function, 1 dB step programmable gain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

Application menu

- MAIN BRIGHTNESS
- SHARPNESS
- WHITE BALANCE
- GAIN
- SHUTTER
- AUTO EXPOSURE
- SATURATION
- GAMMA
- TRIGGER
- FLASH
- AUTO SHADING
- MASKING
- B/W (BLACK BALANCE & WHITE GATE)
- AUTO EXPOSURE
- SHARPNESS
- OTHER FUNC
- Focus detection

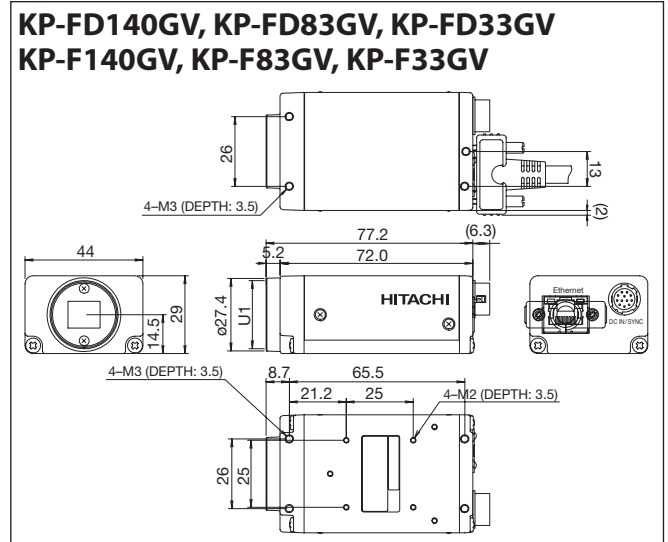
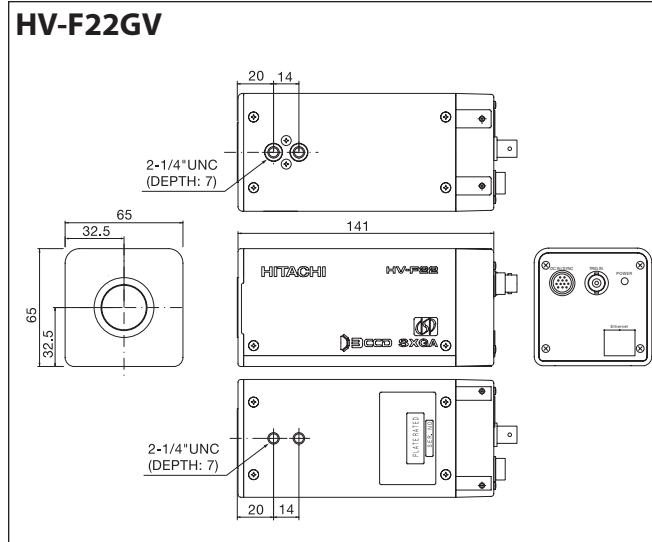


Application image

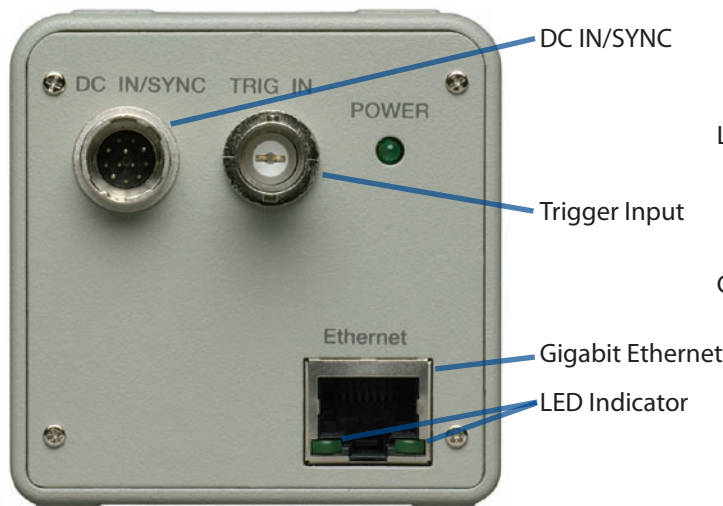
Specifications

		HV-F22GV
Imaging device	Total number of pixels	1/2-inch progressive scan interline CCD (R, G, B 3 CCD)
	No. of effective pixels	1434(H) x 1050(V)
	Pixel size	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)
	Frame rate	15 frames per second
Sensitivity		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	1/15 to 4 second (1 frame step)
	Input	Fixed shutter, One trigger
	Input level	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 ² 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 ² 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)
Supplied equipment		Camera, Lens mount sheet, DC IN / SYNC connector plug (HR10A-10P-12S) and CD-ROM (driver software) and Instruction manual
Optional accessories		LAN cable (Enhanced category 5 or Category 6)

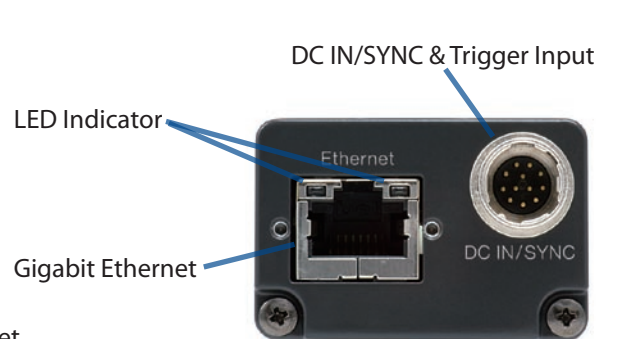
Dimensions



Rear View



HV-F22GV



**KP-FD140GV KP-F140GV
KP-FD83GV KP-F83GV
KP-FD33GV KP-F33GV**

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	*2



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

*2: IRC650 is equipped in the KP-FD/HV-F type camera.

Hitachi Industrial Progressive Scan Camera Line-up

		Image Size				
		VGA	XGA	SXGA	UXGA	5.0M
Frame rate	120fps	(RAW) KP-FR31PCL/SCL (B/W) KP-F31PCL/SCL	(3CCD) : 3CCD output (RGB) : RGB Output (RAW) : RAW Data Output (B/W) : Monochrome Output GigE Vision Series KP-FD type can be select the output image format (RGB/YUV/RAW/MONO)		GV : GigE Vision PCL : Power over Camera Link SCL : Mini Camera Link CL : Camera Link F : IEEE1394.a/b	
	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				
	36fps		(3CMOS)HDTV 720P (920K) HV-HD30			
	30fps		(RGB)KP-FD83GV (B/W) KP-F80PCL/SCL (B/W)KP-F83GV (RAW) KP-FR80PCL/SCL	(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 (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		



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



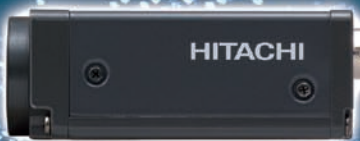
KP-FR200/F200P(S)CL
KP-FR80/F80P(S)CL
KP-FR39/F390P(S)CL
KP-FR30/F30P(S)CL
29x29x29mm



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

GigE Vision™ and the distinctive logo and Camera Link® are trademarks of the AIA (Automated Imaging Association). GENiCAM™ is trademark of the EMVA (European Machine Vision Association). Ethernet is a trademark of Xerox Corporation USA.

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

These Specifications are subject to change without notice.

Hitachi Kokusai Electric Inc.

Head Office : 14-1, Sotokanda 4-chome, Chiyoda-ku, Tokyo 101-8980, Japan
Phone : +81(0) 3-6734-9432 Fax : +81(0) 3-5209-5942
URL : <http://www.h-kokusai.com>

Hitachi Kokusai Electric (Shanghai) Co., Ltd. Beijing Branch
Room 1413, Beijing Fortune Building, 5 Dong San Huan Bei-Lu, Chao Yang District, Beijing
Phone : +86(0) 10-6590-8755 Fax : +86(0) 10-6590-8757

Hitachi Kokusai Electric America, Ltd. URL : <http://hitachikokusai.us>
Headquarters and : 150 Crossways Park Drive, Woodbury, New York 11797, U. S. A.
Northeast Office : Phone : (+1) 516-921-7200 Fax : (+1) 516-496-3718 Service : (+1) 516-682-4409
Northeast Sales : Phone : (+1) 860-757-3892 Fax : (+1) 860-757-3894
West Office : 371 Van Ness Way, Suite 120 Torrance, CA, 90501, U. S. A.
Phone : (+1) 310-328-6116 Fax : (+1) 310-328-6252

Midwest Sales : Phone : (+1) 330-334-4115 Fax : (+1) 516-496-3718 Service : (+1) 989-345-5379
South Sales : Phone : (+1) 727-521-0948 Fax : (+1) 727-527-9056 Service : (+1) 256-774-3777
Parts Center : Phone : (+1) 516-682-4435 Fax : (+1) 516-921-0993
Latin Sales : Phone : (+1) 516-682-4420 Fax : (+1) 516-496-3718

Hitachi Kokusai Electric Canada, Ltd. URL : www.hitachikokusai.ca
Head Office : 1 Select Avenue Unit#11 Scarborough, Ontario M1V 5J3, Canada
Phone : (+1) 416-299-5900 Fax : (+1) 416-299-0450
Eastern Office : 5795 Chemin St. Francois St. Laurent, Quebec H4S 1B6, Canada
Phone : (+1) 514-332-6687 Fax : (+1) 514-335-1664

Hitachi Kokusai Electric Europe GmbH

Head Office : Weiskircher Straße 88, Jügesheim D-63110 Rodgau, Germany
Phone : +49(0) 6106-69920 Fax : +49(0) 6106-16906
URL : www.hitachi-ke-eu.com
General email address : info@hitachi-ke-eu.com

Hitachi Kokusai Electric U.K. Ltd.

Head Office : Windsor House, Britannia Road, Walltham Cross, Hertfordshire EN8 7NX, United Kingdom
Phone : +44(0) 845-121-2177 Fax : +44(0) 845-121-2180
General email address : uksales@hitachi-ke-eu.com



CERTIFICATE No.
JMI-0062
ISO 9001/BS 5750P11
EN 29001/JIS 29001