

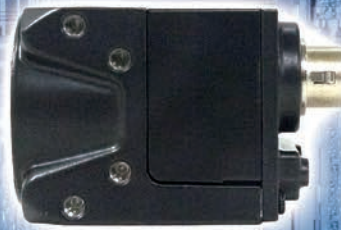
General Catalog

Cameras for Industrial Applications

Camera Photo is Actual Size Position and shape of the rear connectors is different depending on the model.



KP-F520WCL/FD32WCL Series



KP-FMD200UB/FD32UB Series



KP-FMD200GV/FD32GV Series



KP-FM30Lite Series



KP-FMD200PCL Series



KP-FR200PCL/SCL Series



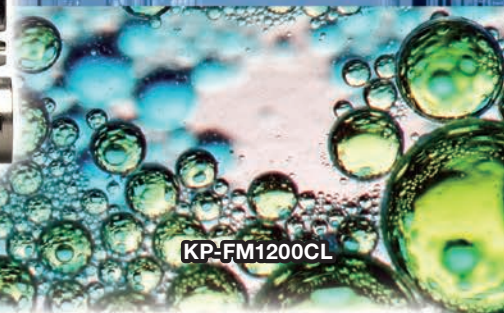
KP-FR230PCL/SCL Series



KP-FMD500GV/UB, FM500WCL
KP-FMR400WCL Series



KP-FD510WCL Series



KP-FM1200CL



KP-HD20A



HV-F202GV/F130GV/F32GV/F202SCL/F130SCL/F32SCL

Camera Overview

Digital Interface Cameras

3CCD Cameras

GigE Vision (Gigabit Ethernet)

HV-F202GV	1/1.8" 3CCD	UXGA (1600 x 1200)	28 fps (YUV)	55(W) x 55(H) x 89(D) mm	Page 7
HV-F130GV	1/3" 3CCD	Quad-VGA (1280 x 960)	30 fps (YUV)	55(W) x 55(H) x 89(D) mm	Page 7
HV-F32GV	1/3" 3CCD	VGA (640 x 480)	112 fps (YUV)	55(W) x 55(H) x 89(D) mm	Page 7

Mini Camera Link

HV-F202SCL	1/1.8" 3CCD	UXGA (1600 x 1200)	30 fps	55(W) x 55(H) x 89(D) mm	Page 8
HV-F130SCL	1/3" 3CCD	Quad-VGA (1280 x 960)	30 fps	55(W) x 55(H) x 89(D) mm	Page 8
HV-F32SCL	1/3" 3CCD	VGA (640 x 480)	200 fps	55(W) x 55(H) x 89(D) mm	Page 8

1CCD Color Cameras

GigE Vision (Gigabit Ethernet)

KP-FMD500GV	2/3" 1CMOS	5M Pixels (2448 x 2048)	9 fps (YUV)	44(W) x 44(H) x 41(D) mm	Page 9-10
KP-FMD200GV	1/1.8" 1CMOS	UXGA (1600 x 1200)	30 fps (YUV)	29(W) x 29(H) x 35(D) mm	Page 9-10
KP-FD500GV	2/3" 1CCD	5M pixel (2448 x 2050)	9 fps (YUV)	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-FD202GV	1/1.8" 1CCD	UXGA (1620 x 1220)	30 fps (YUV)	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-FD140GV	1/2" 1CCD	SXGA (1360 x 1024)	30 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-FD83GV	1/3" 1CCD	XGA (1024 x 768)	36 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-FD33GV	1/3" 1CCD	VGA (659 x 492)	90 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-FD32GV	1/3" 1CCD	VGA (652 x 490)	200 fps	29(W) x 29(H) x 35(D) mm	Page 9-10

USB3 Vision

KP-FMD500UB	2/3" 1CMOS	5M Pixels (2448 x 2048)	60 fps (YUV)	44(W) x 44(H) x 41(D) mm	Page 11-12
KP-FMD200UB	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 20(D) mm	Page 11-12
KP-FD32UB	1/3" 1CCD	VGA (652 x 490)	200 fps	29(W) x 29(H) x 20(D) mm	Page 11-12

Mini Camera Link

KP-FD510WCL	2/3" 1CCD	5M pixel (2448 x 2048)	12 fps	44(W) x 44(H) x 41(D) mm	Page 17-18
KP-FD500SCL/PCL	2/3" 1CCD	5M pixel (2448 x 2048)	12 fps	44(W) x 44(H) x 41(D) mm	Page 17-18
KP-FD202SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44(W) x 44(H) x 41(D) mm	Page 17-18
KP-FD140SCL/PCL	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44(W) x 44(H) x 41(D) mm	Page 17-18
KP-FMD200PCL	1/1.8" CMOS	UXGA (1600 x 1200)	20 fps	29(W) x 29(H) x 20(D) mm	Page 20
KP-FMD100PCL	1/1.8" CMOS	SXGA (1280 x 1024)	30 fps	29(W) x 29(H) x 20(D) mm	Page 20
KP-FD32WCL	1/3" 1CCD	VGA (652 x 490)	200 fps	29(W) x 29(H) x 29(D) mm	Page 16
KP-FMR830CL	1/3" 1CMOS	(640 x 3840) (by 8 cameras)	30 fps	1 Camera: 21.5(W) x 21.5(H) x 21.5(D) mm	Page 23

1CCD Color (RAW) Cameras

Mini Camera Link

KP-FR500WCL	2/3" 1CCD	5M pixel (2448 x 2048)	16 fps	44(W) x 44(H) x 41(D) mm	Page 17-18
KP-FMR400WCL	1" 1CMOS	4M pixel (2048 x 2048)	150 fps	44(W) x 44(H) x 41(D) mm	Page 19
KP-FR230SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	29(W) x 29(H) x 38(D) mm	Page 21
KP-FR200SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29(W) x 29(H) x 29(D) mm	Page 22
KP-FMR200WCL	2/3" 1CMOS	2M pixel (2048 x 1088)	280 fps	44(W) x 44(H) x 41(D) mm	Page 19
KP-FR80SCL/PCL	1/3" 1CCD	XGA (1034 x 779)	36 fps	29(W) x 29(H) x 29(D) mm	Page 22
KP-FR31SCL/PCL	1/3" 1CCD	VGA (659 x 494)	120 fps	29(W) x 29(H) x 38(D) mm	Page 21
KP-FBR30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	Head: 12(W) x 12.5(H) x 47.5(L) mm	Page 21
KP-FR30PCL/SCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 22

1CCD Black & White Cameras

GigE Vision (Gigabit Ethernet)

KP-FM500GV	2/3" 1CMOS	5M Pixel (2448 x 2048)	22 fps	44(W) x 44(H) x 41(D) mm	Page 9-10
KP-F500GV	2/3" 1CCD	5M pixel (2448 x 2050)	16 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-F202GV	1/1.8" 1CCD	UXGA (1620 x 1220)	30 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-FM200GV	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 35(D) mm	Page 9-10
KP-F145GV	2/3" 1CCD NIR	SXGA (1392 x 1040)	30 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-F140GV	1/2" 1CCD	SXGA (1360 x 1024)	30 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-F83GV	1/3" 1CCD	XGA (1024 x 768)	36 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-F33GV	1/3" 1CCD	VGA (659 x 492)	90 fps	44(W) x 29(H) x 72(D) mm	Page 13-14
KP-F32GV	1/3" 1CCD	VGA (652 x 490)	200 fps	29(W) x 29(H) x 35(D) mm	Page 9-10

USB3 Vision

KP-FM500UB	2/3" 1CMOS	5M pixel (2448 x 2048)	60 fps	44(W) x 44(H) x 41(D) mm	Page 11-12
KP-FM200UB	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 20(D) mm	Page 11-12
KP-F32UB	1/3" 1CCD	VGA (652 x 490)	200 fps	29(W) x 29(H) x 20(D) mm	Page 11-12

Camera Overview

Digital Interface Cameras

1CCD Black & White Cameras					
Mini Camera Link					
KP-FM1200CL	1.7" 1CMOS	12M pixel (4096 x 3072)	53 fps	55(W) x 55(H) x 45(D) mm	Page 15
KP-F520WCL	2/3" 1CCD	5M pixel (2448 x 2048)	18 fps	29(W) x 29(H) x 29(D) mm	Page 16
KP-F500WCL	2/3" 1CCD	5M pixel (2448 x 2048)	16 fps	44(W) x 44(H) x 41(D) mm	Page 17
KP-FM500WCL	2/3" 1CMOS	5M pixel (2448 x 2048)	163 fps	44(W) x 44(H) x 41(D) mm	Page 19
KP-FM400WCL	1" 1CMOS	4M pixel (2048 x 2048)	150 fps	44(W) x 44(H) x 41(D) mm	Page 19
KP-F230SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	29(W) x 29(H) x 38(D) mm	Page 21
KP-F200SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29(W) x 29(H) x 29(D) mm	Page 22
KP-FM200WCL	2/3" 1CMOS	2M pixel (2048 x 1088)	280 fps	44(W) x 44(H) x 41(D) mm	Page 19
KP-FM200PCL	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 20(D) mm	Page 20
KP-F145WCL	2/3" 1CCD NIR	SXGA (1392 x 1040)	30 fps	44(W) x 44(H) x 41(D) mm	Page 17
KP-FM100PCL	1/1.8" 1CMOS	SXGA (1280 x 1024)	61 fps	29(W) x 29(H) x 20(D) mm	Page 20
KP-F80SCL/PCL	1/3" 1CCD	XGA (1034 x 779)	36 fps	29(W) x 29(H) x 29(D) mm	Page 22
KP-F32WCL	1/3" 1CCD	VGA (660 x 494)	200 fps	29(W) x 29(H) x 29(D) mm	Page 16
KP-F31SCL/PCL	1/3" 1CCD	VGA (660 x 494)	120 fps	29(W) x 29(H) x 38(D) mm	Page 21
KP-F30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 22
PoCL Lite					
KP-F200Lite	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29(W) x 29(H) x 29(D) mm	Page 24
KP-F80Lite	1/3" 1CCD	XGA (1034 x 779)	36 fps	29(W) x 29(H) x 29(D) mm	Page 24
KP-F30Lite	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 24
KP-FM30Lite	1/3" 1CMOS	VGA (752 x 480)	90 fps	21.5(W) x 21.5(H) x 21.5(D) mm	Page 24
KP-FBM30Lite	1/3" 1CMOS	VGA (752 x 480)	90 fps	21.5(W) x 21.5(H) x 21.5(D) mm	Page 24

HDTV Cameras

3CCD Cameras					
DK-H100	2/3" 3CCD	1080i (1920 x 1080)		99(W) x 105(H) x 155(D) mm	Page 25
DK-Z50	2/3" 3CCD	1080i (1920 x 1080)		99(W) x 105(H) x 155(D) mm	Page 25
HV-HD33	1/3" 3MOS	1080i / 720p (1280 x 720)		65(W) x 65(H) x 125(D) mm	Page 26
1CCD Color Cameras					
KP-HD1005	1/3" 1CMOS	1080 30P (1920 x 1080)		64(W) x 63(H) x 135(D) mm	Page 27-28
KP-HD1005-S2	1/3" 1CMOS	1080 30P (1920 x 1080)		64(W) x 63(H) x 135(D) mm	Page 27-28
KP-HD1005-S4	1/3" 1CMOS	1080 59.94i/29.97p (1920 x 1080) P type: 1080 50i/25p (1920 x 1080)		64(W) x 63(H) x 103(D) mm	Page 27-28
KP-HD1005-S5	1/3" 1CMOS	1080 59.94i/29.97p (1920 x 1080) P type: 1080 50i/25p (1920 x 1080)		64(W) x 63(H) x 103(D) mm	Page 27-28
KP-HD1001	1/3" 1CMOS	1080 30P (1920 x 1080)		64(W) x 63(H) x 135(D) mm	Page 27-28
KP-HD20A	1/3" 1CMOS	1080 59.94i/50i/29.97p/25p (1920 x 1080)		44(W) x 44(H) x 59(D) mm	Page 27-28
KP-HD20A-S2	1/3" 1CMOS	1080 60P (1920 x 1080)		44(W) x 44(H) x 59(D) mm	Page 27-28

Analog Interface Cameras

1CCD Color Cameras					
KP-D20B	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		44(W) x 44(H) x 49(D) mm	Page 29
KP-D20A	1/3" 1CCD	NTSC (768 x 494), PAL (752 x 582)		44(W) x 44(H) x 49(D) mm	Page 29
KP-D5001	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64(W) x 63(H) x 135(D) mm	Page 30
KP-D5000	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64(W) x 63(H) x 135(D) mm	Page 30
KP-D5010	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64(W) x 63(H) x 64(D) mm	Page 30

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Hitachi Industrial Digital Interface Camera Line-up	Back cover

Digital Interface Cameras

About Digital Interface

GigE Vision (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.

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

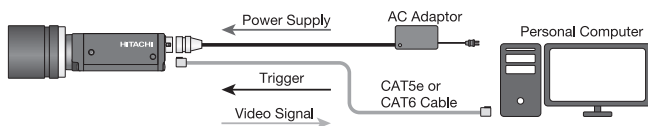
Development of camera control system is easy because industrial camera control API "GenICam" lead EMVA (European Machine Vision Association).

Power can be supplied via Ethernet cable for PoE enabled models (Power over Ethernet).

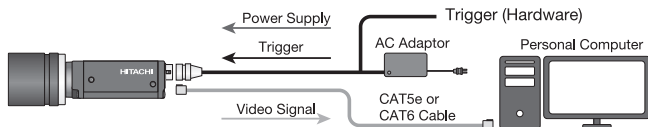
Applicable Models (PoE Enabled): HV-F202GV, HV-F130GV, HV-F32GV, KP-FMD500GV, KP-FM500GV, KP-FMD200GV, KP-FM200GV, KP-FD32GV, KP-F32GV, KP-FD510GV, KP-F510GV, KP-FD500GV, KP-F500GV, KP-FD202GV, KP-F202GV, KP-F145GV, KP-FD140GV, KP-F140GV, KP-FD83GV, KP-F83GV, KP-FD33GV, KP-F33GV,

System Configuration (example)

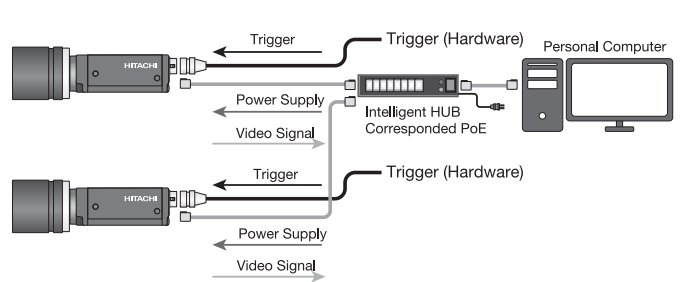
- Direct Connection to PC and Triggered via Ethernet (Software Trigger)



- Direct Connection to PC and Triggered via Multi-connector (Hardware Trigger)



- Connection Via HUB/Switcher to PC and Power Supply via the Ethernet (PoE)

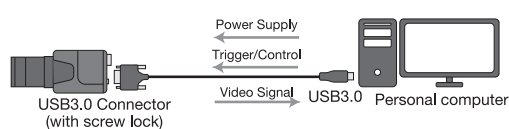


USB3 Vision

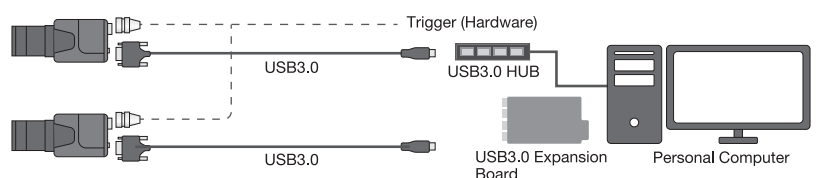
USB3 Vision is the next standard generation for industrial camera interface from the AIA (Automated Image Association), that makes use of the USB3 connector on a PC, to achieve transmission speeds equivalent to the Medium Configuration of Camera Link. USB3 has about 10 times the bandwidth of USB2 and offers a simple and reliable low cost two way transmission system between the camera and the PC. An industrial style screw lock connector provides a reliable plug-and-play connection while providing camera power. Reduced CPU loads due to DMA allow acquisition of stable images with low latency.

Applicable Models: KP-FMD500UB, KP-FM500UB, KP-FMD200UB, KP-FM200UB, KP-FD32UB, KP-F32UB

- Simple Connection example



- Connection example of multiple Cameras using the expansion board or USB3.0 HUB
Trigger realized with USB3.0 or via 6-pin connector.



Digital Interface Cameras

About Digital Interface

Camera Link

Camera link is an AIA imaging standard for serial digital interface between a camera and a frame grabber. Camera Link is available in Base, Medium or Full configurations depending on the camera resolution, bit depth and frame rate. In addition there are several different types of Camera Link interfaces including Mini CL, PoCL for power over Camera Link, and PoCL Lite for reduced connector and cable size.

Applicable Models

Model	Type of CameraLink	Configuration	Model	Type of CameraLink	Configuration	Model	Type of CameraLink	Configuration
KP-FM500WCL	Mini CL (Auto Selection of PoCL or non-PoCL)	Base Medium Full	KP-F200PCL	Mini CL (PoCL)	Base	KP-F230SCL	Mini CL (Non-PoCL)	Base
KP-FMR400WCL			KP-F80PCL			KP-F200SCL		
KP-FM400WCL			KP-F31PCL			KP-F80SCL		
KP-FMR200WCL		KP-F30PCL	KP-F31SCL					
KP-FM200WCL		KP-FR230PCL	KP-F30SCL					
KP-FD510WCL		KP-FR200PCL	KP-FR230SCL					
KP-F500WCL		KP-FR80PCL	KP-FR200SCL					
KP-FR500WCL		KP-FR31PCL	KP-FR80SCL					
KP-F520WCL		KP-FR30PCL	KP-FR31SCL					
KP-F145WCL		KP-FBR30PCL	KP-FR30SCL					
KP-F32WCL	Mini CL (PoCL)	Base Medium Full	KP-FM1200CL	Mini CL (Non-PoCL)	Base Medium	KP-FBR30SCL	PoCL-Lite	Base
KP-FD500PCL			HV-F202SCL			KP-F200Lite		
KP-FD202PCL			HV-F130SCL			KP-F80Lite		
KP-FD140PCL			HV-F32SCL			KP-F30Lite		
KP-FM200PCL			KP-FD500SCL			KP-FM30Lite		
KP-FM100PCL		KP-FD202SCL	KP-FBM30Lite					
KP-FMD200PCL		KP-FD140SCL						
KP-FMD100PCL								
KP-F230PCL								

Mini CL

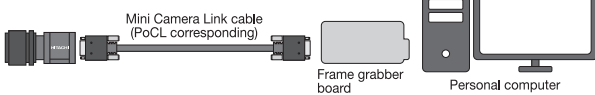
By adopting a Camera Link digital interface, high speed video data transfer is possible. Furthermore, by adopting the small connector (SDR) of a Mini Camera Link standard, the size of the camera has been reduced.

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

System Configuration for PoCL (example)

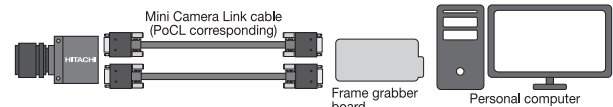
• Base Configuration

Applicable Model: WCL, PCL type all models



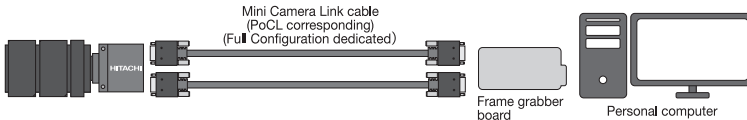
• Medium Configuration

Applicable Model: KP-FD510WCL, KP-FD500PCL, KP-FR500WCL, KP-F500WCL, KP-FM500WCL, KP-FMR400WCL, KP-FM400WCL, KP-FD202PCL, KP-FMR200WCL, KP-FM200WCL, KP-FD140PCL



• Full Configuration

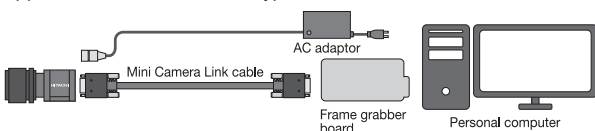
Applicable Model: KP-FM500WCL, KP-FMR400WCL, KP-FM400WCL, KP-FMR200WCL, KP-FM200WCL



System Configuration for Non-PoCL (example)

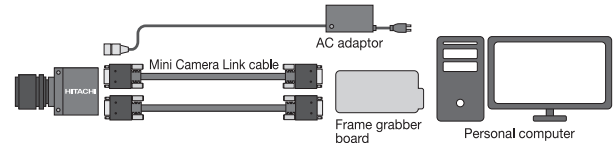
• Base Configuration

Applicable Model: WCL, SCL type all models, KP-FM1200CL, KP-FMR830CL



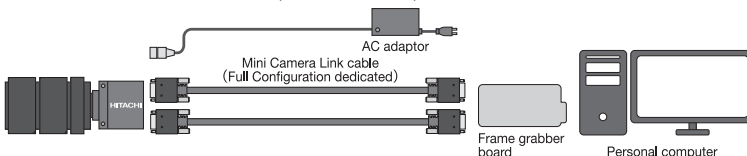
• Medium Configuration

Applicable Model: HV-F202SCL, HV-F130SCL, HV-F32SCL, KP-FM1200CL, KP-FD510WCL, KP-FD500SCL, KP-FR500WCL, KP-F500WCL, KP-FM500WCL, KP-FMR400WCL, KP-FM400WCL, KP-FD202SCL, KP-FMR200WCL, KP-FM200WCL, KP-FD140SCL



• Full Configuration

Applicable Model: KP-FM1200CL, KP-FM500WCL, KP-FMR400WCL, KP-FM400WCL, KP-FMR200WCL, KP-FM200WCL

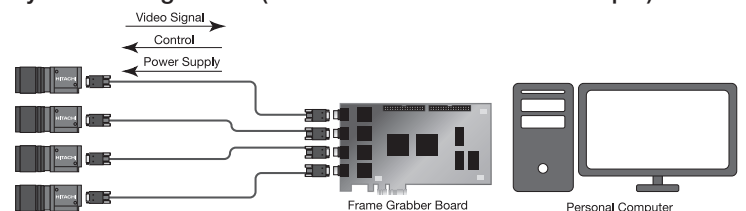


PoCL-Lite

PoCL Lite features a smaller Camera Link connector reducing the pin count from 26 pins to 14 pins along with a smaller cable which allows smaller camera size and more connectors on the frame grabber board allowing the support of up to four cameras by a single frame grabber board. PoCL-Lite supports Base Camera Link configuration and provides power to the camera over the interface along with serial camera data for image and camera control.

Applicable Models: KP-F200Lite, KP-F80Lite, KP-F30Lite, KP-FM30Lite, KP-FBM30Lite

System Configuration (Four camera connection example)



Digital Interface Cameras

Main Features

A variety of interface

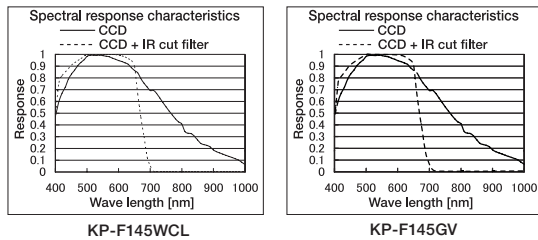
By a variety of interfaces, it is adaptable to a variety of systems.

GigE Vision		-GV models
USB3 Vision		-UB models
Mini Camera Link	Auto Selection of PoCL or non-PoCL	-WCL models
	PoCL	-PCL models
	Non-PoCL	-SCL models
PoCL-Lite		-Lite models

Near infrared sensitivity

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

Applicable models: KP-F145WCL, KP-F145GV



Raw Data Output (KP-FRxxx Models)

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

High color fidelity (KP-FDxxx/KP-FMDxxx Models)

RGB primary color mosaic filter achieve high color fidelity.

High resolution & high speed

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

280 fps	2.23 Mpixel: KP-FMR200WCL / FM200WCL
200 fps	VGA: KP-FD32GV / F32GV / FD32UB / F32UB / FD32ECL / F32WCL, HV-F32SCL
163 fps	5.01 Mpixel: KP-FM500WCL
150 fps	4.19 Mpixel: KP-FMR400WCL / FM400WCL
120 fps	VGA: KP-FR31PCL / F31PCL / FR31SCL / F31SCL
112 fps	VGA: HV-F32GV
90 fps	VGA: KP-FD33GV / F33GV / FM30Lite / FBM30Lite
61 fps	SXGA: KP-FM100PCL
60 fps	5.01 Mpixel: KP-FM500UB VGA: KP-FR30PCL / FR30SCL L / F30PCL / F30SCL / FBR30PCL / FBR30SCL / F30Lite
53 fps	12.58 Mpixel: KP-FM1200CL UXGA: KP-FM200GV / FMD200UB / FM200UB / FM200PCL
36 fps	XGA: KP-FD83GV / F83GV / FR80PCL / FR80SCL / F80PCL / F80SCL / F80Lite
30 fps	UXGA: HV-F202SCL, KP-FR230PCL / FR230SCL / F230PCL / F230SCL / FD202GV / F202GV / FD202PCL / FD202SCL / FMD200GV SXGA: KP-F145GV/F145WCL/FD140GV/F140GV/FD140PCL/FD140SCL/FMD100PCL Quad-VGA: HV-F130GV / F130SCL
28 fps	UXGA: HV-F202GV
22 fps	5.01 Mpixel: KP-FM500GV
20 fps	UXGA: KP-FMD200PCL
18 fps	5.01 Mpixel: KP-F520WCL
16 fps	5.01 Mpixel: KP-F500GV / FR500WCL / F500WCL
15 fps	UXGA: KP-FR200PCL / FR200SCL / F200PCL / F200SCL / F200Lite
12 fps	5.01 Mpixel: KP-FD510WCL / FD500PCL / FD500SCL
9 fps	5.01 Mpixel: KP-FMD500GV / FD500GV

Four-sided attachment mechanism

Applicable Models: KP-FM1200CL / F520WCL / FMD200GV / FM200GV / FMD200UB / FM200UB / FMD200PCL / FM200PCL / FMD100PCL / FM100PCL / F32GV / FD32GV / F32UB / FD32UB / F32WCL

Can be attached four-side of the camera, making it suitable for camera installation of the narrow portion.

Compact and lightweight

Achieve a minimum size of [21.5 (W) x 21.5 (H) x 21.5 (D) mm] in PoCL-Lite model. Also in other models have realized the compact size.

	Dimensions WxHxDmm (Not including protrusions and lens)	Models
1CCD (CMOS) Models	21.5 x 21.5 x 21.5	KP-FM30Lite / FBM30Lite, KP-FMR830(1 Camera)
	29 x 29 x 20	KP-FMD200UB / FM200UB / FMD200PCL / FM200PCL / FMD100PCL / FM100PCL/FD32UB/F32UB
	29 x 29 x 29	KP-F520WCL / FR200PCL / FR200SCL / F200PCL / F200SCL / FR80PCL / FR80SCL / F80PCL / F80SCL / FD32WCL / F32WCL / FR30PCL / FR30SCL / F30PCL / F30SCL / F200Lite / F80Lite / F30Lite
	29 x 29 x 35	KP-FMD200GV / FM200GV / FD32GV / F32GV
	29 x 29 x 38	KP-FR230PCL / FR230SCL / F230PCL / F230SCL / FR31PCL / FR31SCL / F31PCL / F31SCL
	44 x 44 x 41	KP-FD510WCL / FMD500GV / FM500GV / FMD500UB / FM500UB / FM500WCL / FD500PCL / FD500SCL / FR500WCL / F500WCL / FMR400WCL / FM400WCL / FD202PCL / FD202SCL / FMR200WCL / FM200WCL / F145WCL / FD140PCL / FD140SCL
	55 x 55 x 45	KP-FM1200CL
	44 x 29 x 72	KP-F500GV / F202GV / F145GV / F140GV / F83GV / F33GV / FD500GV / FD202GV / FD140GV / FD83GV / FD33GV
	12 x 12.5 x 47.5	Camera Head: KP-FBR30PCL/FBR30SCL
	3CCD	55 x 55 x 89

Frame Shutter

Higher vertical resolution for moving objects.

Multi-step Shutter

Electronic shutter is provided with multi-step or variable speed.

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 digital interface, various setting such as shutter, mode, gain, partial scan, bit depth, etc can be adjusted.

Partial Scan

The vertical start line and number of lines can be adjusted. Higher frame rates are possible by using partial scan mode. (KP-FM1200CL can be set eight area) (KP-FM200PCL/FMD200PCL/FM100PCL/FMD100PCL/FM200UB/FM200GV/FMD200UB/FMD200GV: The start position and area of H and V direction can be set in one pixel spacing.)

Digital Interface Cameras

Main Features

Frame buffer function

Applicable Models: KP-FM500WCL

It is equipped with a frame buffer function to take advantage of the high-speed performance. This allows slow motion output.

Double exposure mode

Applicable Models: KP-F32GV

Superposing each image exposed with two external trigger can be output.

Cropping mode

Applicable Models: KP-FM500WCL / FMD200PCL / FM200PCL

A user selectable cropping area featuring reduced resolution (VGA/XGA/SXGA) can be selected to increase the camera frame rate. The KP-FM500WCL can operate at 652 fps in the VGA mode.

Vertical subsampling modes

Applicable Models: KP-FM1200CL / FM500WCL / FMR400WCL / FMR200WCL/FM400WCL/KP-FM200WCL

Enables high-speed readout by vertical decimation of 2 to 10 times

Vertical 2 pixels additional Modes

Applicable Models: KP-F520WCL/F500WCL/F145WCL / F230PCL/F230SCL/F31PCL/F31SCL

Enables high-speed readout by the vertical 2 pixels addition mode

Temperature detection output

Applicable Models: KP-F520WCL

The internal temperature of the camera can be read.

White spot detecting and correction

White spots that result from radiation or high temperature can be detected and corrected.

Knee adjustment

Applicable Models: KP-F520WCL, FD Model, FMD model, -GV Model, -UB Model, 3CCD model

Gamma adjustment

Applicable Models: KP-F520WCL / FD510WCL / FM500WCL / FD202PCL / FD202SCL / FD140PCL / FD140SCL,FD32WCL / F32WCL,

HV-F202SCL / F130SCL / F32SCL, -UB Models, -GV Models
Gamma curve can be adjusted by the LUT.

FLASH output

Applicable Models: KP-F520WCL / FD500GV / F500GV / FD202GV / F202GV / FMD200GV / FM200GV / FMD200UB / FM200UB / F145GV / FD140GV / F140GV / FD83GV / F83GV / FD33GV / F33GV / F32WCL / FD32GV / F32GV / FD32UB / F32UB

The camera has an output-signal to control and synchronize an external flash to the camera exposure.

Selectable White Balance Adjustment

Applicable Models: (KP-FDXXX/FMDxxx Models, 3CCD Models)

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

6-Vector Independent Masking

Applicable Models: (KP-FDXXX/FMDxxx Models, 3CCD Models)

A 6-Vector color correction 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.

Selectable bit depth

Bit Depth	Applicable models
8 / 10 / 12	KP-F520WCL / F500GV / FM500UB / FM500WCL / FR500WCL / F500WCL / F202GV / FM200UB / F145GV / F145WCL / F140GV / F83GV / F33GV / F32UB / F32WCL
8 / 10	KP-FM1200CL / FM500GV / FMR400WCL / FM400WCL / FR230PCL / FR230SCL/F230PCL / F230SCL /FM200GV / FMR200WCL / FM200WCL / FM200PCL / FR200PCL / FR200SCL / F200PCL / F200SCL / FM100PCL / FR80PCL / FR80SCL / F80PCL / F80SCL / F32GV / FR31PCL /FR31SCL / F31PCL / F31SCL / FR30PCL / FR30SCL / F30PCL / F30SCL / FBR30PCL / FBR30SCL / F200Lite / F80Lite / F30Lite / FM30Lite / FBM30Lite
24 / 30 / 36	HV-F202GV / F202SCL / F130GV / F130SCL / F32GV / F32SCL / KP-FD510WCL / FMD500UB / FD500GV / FD500PCL / FD500SCL / FD202GV / FD202PCL / FD202SCL / FMD200UB / FD140GV / FD140PCL / FD140SCL / FD83GV / FD33GV / FD32GV / FD32UB / FD32WCL
24 / 30	KP-FMD500GV / FMD200GV
24	KP-FMR830CL / FMD200PCL / FMD100PCL

Features for 3CCD Models

(HV-F202GV / F202SCL / F130GV / F130SCL / F32GV / F32SCL)

Adjustable sharpness (DTL) width

Sharpness (DTL) width is adjustable. A feeling of natural definition is provided when set a lower sharpness. A higher setting results in an image with enhanced contours.

Auto shading (ASC)

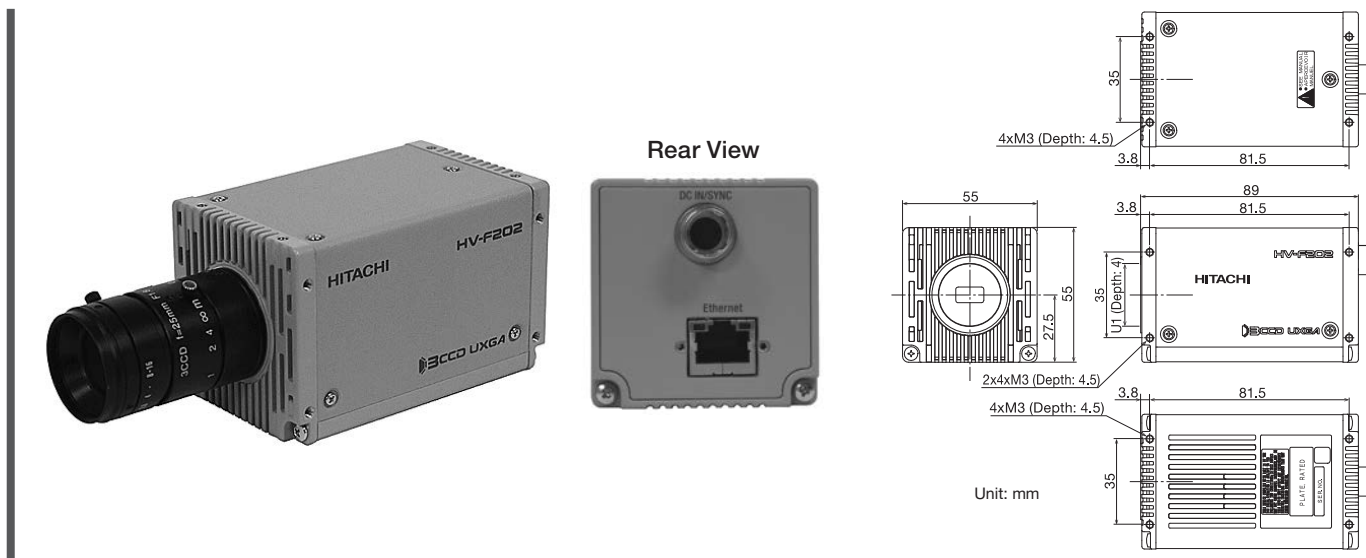
Color shading (non-uniformity of color distribution) due to lens and lighting can be corrected automatically.

Versatile imaging functions

- Long time integration mode.
- Four application files.
Four different complete camera setups can be stored and recalled.
- Realtime automatic white balance function (ATW)
Changes in the color temperature of the of the illumination can be adjusted automatically.
- Auto exposure (ALC: auto level control)
The ALC examines and uses 64 separate areas of the image to continuously control the AGC and AES, providing extremely wide response to variations in light. Peak or Average ALC response can be selected from the camera menu.
- Two mode gain control
AGC or user-programmable gain in 1 dB steps.
- Master black, R/B black, and R/B gain are adjustable.

Digital Interface Cameras

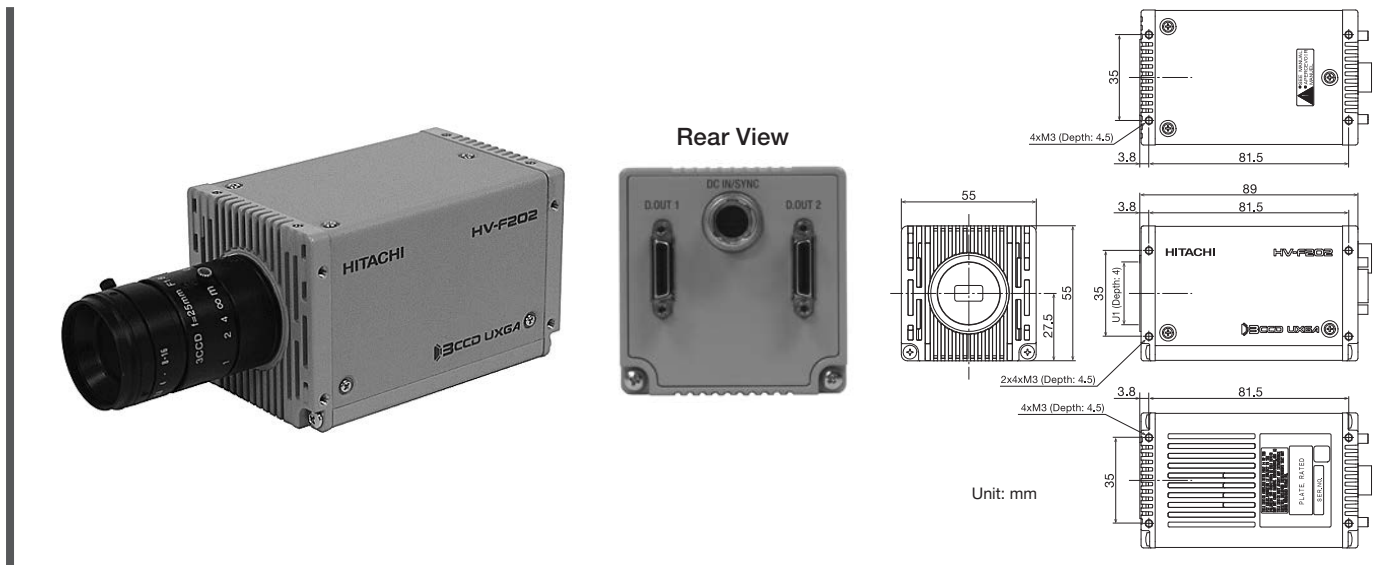
HV-F202GV	GigE Vision	3CCD Color (RGB/YUV)	1/1.8" CCD	UXGA (1.92M pixels) (1600 x 1200)	Max.28 frames per sec. (YUV 24 bits)	55(W) x 55(H) x 89(D) mm
HV-F130GV			1/3" CCD	Quad-VGA (1.23M pixels) (1280 x 960)	Max.30 frames per sec. (YUV 24 bits)	
HV-F32GV				VGA (0.31M pixels) (640 x 480)	Max.112 frames per sec. (YUV 24 bits)	



		HV-F202GV	HV-F130GV	HV-F32GV		
Imaging device		1/1.8-inch progressive scan interline CCD (R, G, B 3 CCD)		1/3-inch progressive scan interline CCD (R, G, B 3 CCD)		
	Effective pixels	1600(H) x 1200(V)		1280(H) x 960(V)		
	Pixel size	4.4 μm(H) x 4.4 μm(V) (Square pixel)		3.75 μm(H) x 3.75 μm(V) (Square pixel)		
	Optical system	1/1.8-inch F1.8 prism		1/2-inch F2.2 prism		
Scanning area	7.04 mm(H) x 5.28 mm(V)		4.8 mm(H) x 3.6 mm(V)	4.736 mm(H) x 3.552 mm(V)		
Scanning system	Progressive					
Scanning Frequency	Horizontal: 37.5 kHz Vertical: 29.95 Hz Pixel clock frequency: 72 MHz		Horizontal: 29.76 kHz Vertical: 30.06 Hz Pixel clock frequency: 45 MHz	Horizontal: 56.82 kHz Vertical: 112.51 Hz Pixel clock frequency: 33.75 MHz		
Sync system	Internal / VD external					
Lens mount	C-mount (Flange focal distance: 17.526 mm)					
Video output	Gigabit Ethernet IEEE802.3ab (1000BASE-T), GigE Vision Support, GenICam Support RGB (24 bit/30 bit/ 36 bit), YUV (24 bit/30 bit/ 36 bit)					
Frame rate		Frame rate (frames per second)			30 frames per second (YUV 24 bit)	112 frames per second (YUV 24 bit)
		24 bit	30 bit	36 bit		
	RGB	18	12	9		
	YUV	28	18	18		
Sensitivity (shutter off)	2000 lx, F5.6, 3200K					
Electric shutter		OFF / Auto(AES) / Manual (Variable)				
	Variable	1/30 to 1/100,000 second			1/200 to 1/100,000 second	
	AES	1/30 to 1/100,000 second			1/200 to 1/100,000 second	
Long time integration	1/30 to approx. 4 second (1 frame step)		1/30 to approx. 10 second (1 frame step)	1/112 to approx. 10 second (1 frame step)		
External trigger	Mode	Fixed shutter, One trigger				
	Input	Via Gigabit Ethernet cable or DC IN/SYNC connector				
	Input level	5 Vp-p ±0.5 V				
External sync signal (Strobe out)	VD output, Flash out					
Registration	Full Screen: 0.05% (except lens characteristics)					
Vertical Sharpness	2H					
White balance	Manual / One-push auto / Continuous auto					
Gain	Manual: 0 to +12 dB, AGC: 0 to +12 dB (with limit setting)					
Gamma	0.45 / 1.0 / LUT (Look up table: user customizable)					
Color masking	OFF/ON (6 color independent masking)					
Sharpness	Sharpness (DTL) level, Sharpness (DTL) width					
Paint black	Adjustable					
Black level	Adjustable					
Knee	Adjustable (Knee point and knee slope)					
Power supply	DC+12 V ±1 V (from DC IN / SYNC connector), 48V (PoE)					
Power consumption	Approx. 7.8 W (DC+12 V)		DC+12 V	DC+12 V		
Performance		0 °C to +40 °C (+32 °F to +104 °F), 90 %RH or less				
	Operating	-10 °C to +40 °C (+14 °F to +104 °F), 90 %RH or less				
	Storage	-20 °C to +60 °C (-4 °F to +140 °F), 70 %RH or less, without dew condensation				
Vibration endurance	10 to 200 Hz 24.5 m/s ²					
Shock endurance	392 m/s ²					
External dimensions	55(W) x 55(H) x 89(D) mm (not including lens and protrusions)					
Mass	Approx. 350 g (without lens)		Approx. 300 g (without lens)			

Digital Interface Cameras

HV-F202SCL			1/1.8" CCD	UXGA (1.92M pixels) (1600 x 1200)	Max.30 frames per sec.	55(W) x 55(H) x 89(D) mm
HV-F130SCL	MiniCL (Non-PoCL)	3CCD Color (RGB)	1/3" CCD	Quad-VGA (1.23M pixels) (1280 x 960)	Max.30 frames per sec.	
HV-F32SCL				VGA (0.31M pixels) (640 x 480)	Max.200 frames per sec.	



		HV-F202SCL	HV-F130SCL	HV-F32SCL
Imaging device	Effective pixels	1/1.8-inch progressive scan interline CCD (R, G, B 3 CCD)	1/3-inch progressive scan interline CCD (R, G, B 3 CCD)	
	Pixel size	1600(H) x 1200(V)	1280(H) x 960(V)	640(H) x 480(V)
	Pixel size	4.4 μm(H) x 4.4 μm(V) (Square pixel)	3.75 μm(H) x 3.75 μm(V) (Square pixel)	7.4 μm(H) x 7.4 μm(V) (Square pixel)
	Optical system	1/1.8-inch F1.8 prism	1/1.8-inch F2.2 prism	
Scanning area		7.04 mm(H) x 5.28 mm(V)	4.8 mm(H) x 3.6 mm(V)	4.736 mm(H) x 3.552 mm(V)
Scanning system		Progressive		
Scanning Frequency		Horizontal: 37.5 kHz Vertical: 29.95 Hz Pixel clock frequency: 72 MHz	Horizontal: 29.76 kHz Vertical: 30.06 Hz Pixel clock frequency: 45 MHz	Horizontal: 101.01 kHz Vertical: 200.02 Hz Pixel clock frequency: 60 MHz
Sync system		Internal / VD external		
Lens mount		C-mount		
Flange focal distance		17.526 mm		
Video output		Camera Link support Base Configuration / Medium Configuration Base Configuration: RGB 24bit Medium Configuration: RGB 30bit / RGB 36bit		
Frame rate		30 frames per second		200 frames per second
Sensitivity (shutter off)		2000 lx, F5.6, 3200K		
Electric shutter	Variable	OFF / Auto(AES) / Manual (Variable)		1/200 to 1/100,000 second
	AES	1/30 to 1/100,000 second		1/200 to 1/100,000 second
	Long time integration	1/30 to approx. 4 second (1 frame step)	1/30 to approx. 10 second (1 frame step)	1/200 to approx. 10 second (1 frame step)
External trigger	Mode	Fixed shutter, One trigger		
	Input	Via Camera Link cable (CC1) or DC IN/SYNC connector		
	Input level	5 Vp-p ±0.5 V		
External sync signal (Strobe out)		VD output, Flash out		
Registration		Full Screen: 0.05% (except lens characteristics)		
Vertical Sharpness		2H		
White balance		Manual / One-push auto / Continuous auto		
Gain		Manual: 0 to +12 dB, AGC: 0 to +12 dB (with limit setting)		
Gamma		0.45 / 1.0 / LUT (Look up table: user customizable)		
Color masking		OFF/ON (6 color independent masking)		
Sharpness		Sharpness (DTL) level, Sharpness (DTL) width		
Paint black		Adjustable		
Black level		Adjustable		
Knee		Adjustable (Knee point and knee slope)		
Power supply		DC+12 V ±1 V (from DC IN / SYNC connector)		
Power consumption		Approx. 7.2 W (DC+12 V)	DC+12 V	Approx. 9 W (DC+12 V)
Performance	Operating	0 °C to +40 °C (+32 °F to +104 °F), 90 %RH or less		
	Storage	-10 °C to +40 °C (+14 °F to +104 °F), 90 %RH or less		
		-20 °C to +60 °C (-4 °F to +140 °F), 70 %RH or less, without dew condensation		
Vibration endurance		10 to 200 Hz 24.5 m/s ²		
Shock endurance		392 m/s ²		
External dimensions		55(W) x 55(H) x 89(D) mm (not including lens and protrusions)		
Mass		Approx. 350 g (without lens)	Approx. 300 g (without lens)	

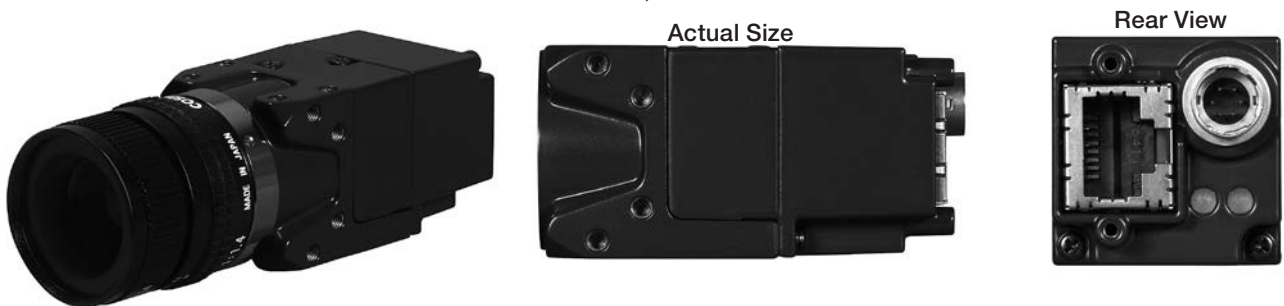
Digital Interface Cameras

KP-FM500GV	GigE Vision	1CMOS Black & Withe	2/3" CMOS	5.01 M Pixels (2448 x 2048)	Max. 22 frames per sec.	44(W) x 44(H) x 41(D) mm
KP-FMD500GV		1CMOS Color (RGB/YUV/RAW)			Max. 9 frames per sec.	
KP-FM200GV		1CMOS Black & Withe	1/1.8" CMOS	UXGA (1.92 M Pixels) (1600 x 1200)	Max. 53 frames per sec.	29(W) x 29(H) x 35(D) mm
KP-FMD200GV		1CMOS Color (RGB/YUV/RAW)			Max. 30 frames per sec.	
KP-F32GV		1CCD Black & Withe	1/3" CCD	VGA (0.32 M Pixels) (652 x 490)	Max. 200 frames per sec.	
KP-FD32GV		1CCD Color (RGB/YUV/RAW)				

KP-FM200GV, KP-FMD200GV

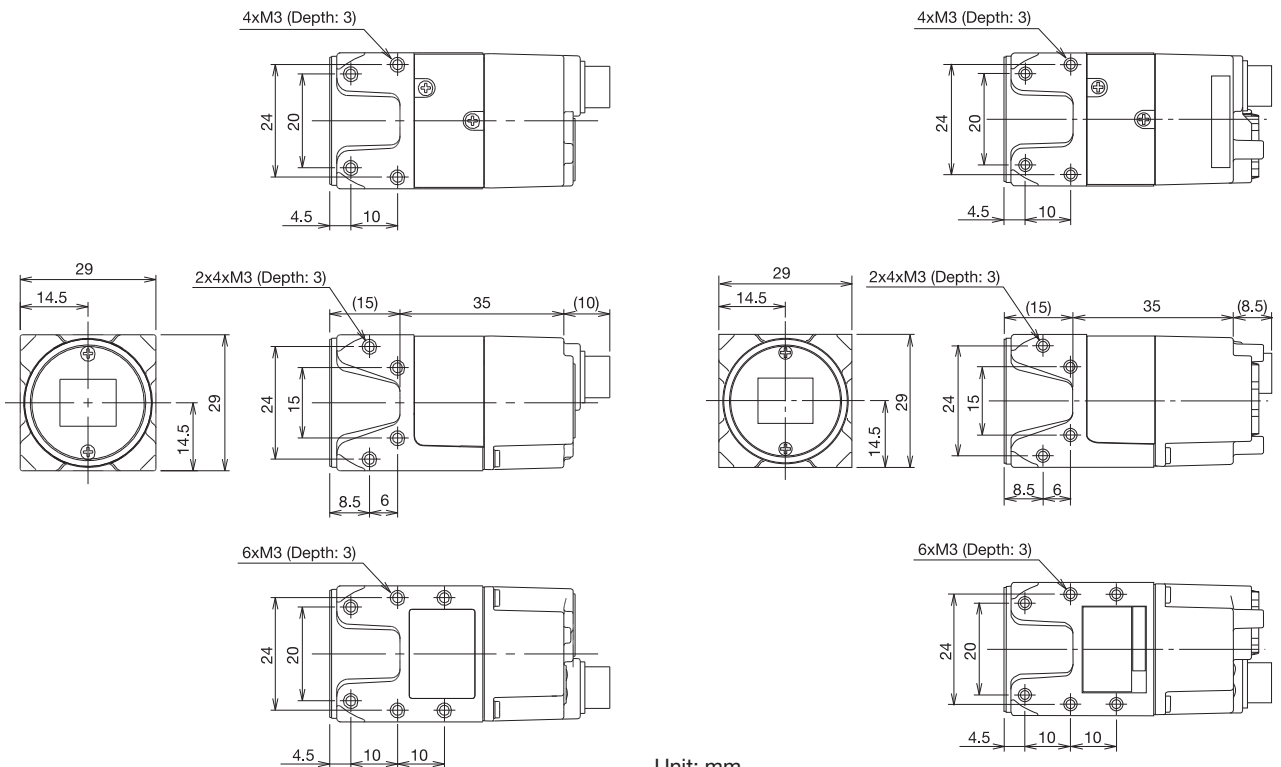


KP-F32GV, KP-FD32GV



KP-FM200GV, KP-FMD200GV

KP-F32GV, KP-FD32GV



Unit: mm

Digital Interface Cameras

		KP-FMD500GV	KP-FM500GV	KP-FMD200GV	KP-FM200GV	KP-FD32GV	KP-FD32GV	
Imaging device		2/3-inch CMOS		1/1.8-inch CMOS		1/3-inch CCD		
	Effective pixels	2448(H) x 2048(D)		1600(H) x 1200(D)		659(H) x 494(D)		
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)		4.5 μm(H) x 4.5 μm(V) (Square pixel)		7.4 μm(H) x 7.4 μm(V) (Square pixel)		
	Color filter	RGB primary color mosaic filter	–	RGB primary color mosaic filter	–	RGB primary color mosaic filter	–	
Scanning area	8.45 mm(H) x 7.07 mm(V)		7.2 mm(H) x 5.4 mm(V)		4.88 mm(H) x 3.66 mm(V)			
Scanning system	Progressive							
Sync system	Internal							
Lens mount	C-mount (Flange focal distance: 17.526 mm)							
Video output	Interface	Gigabit Ethernet						
	Protocol	GigE Vision compliant						
	Image format	RGB 24/30 bit, YUV(4:2:2) 24/30 bit RAW 8/10 bit Mono 8/10 bit	Mono 8/10 bit	RGB 24/30 bit, YUV (4:2:2) 24/30 bit RAW 8/10 bit Mono 8/10 bit	Mono 8/10/12 bit	RGB 24/30 bit, YUV(4:2:2) 24/30 bit RAW 8/10 bit Mono 8/10 bit	Mono 8/10 bit	
	Image size	2448(H) x 2048(D)		1600(H) x 1200(D)		652(H) x 490(D)		
	Frame rate	9 frames per second (YUV) 7 frames per second (RGB)	22 frames per second	30 frames per second (YUV) 18 frames per second (RGB)	53 frames per second	200 frames per second		
Sensitivity	2000 lx, F5.6, 3200K	400 lx, F8, 3200K	2000 lx, F5.6, 3200K	500 lx, F5.6, 3200K	2000 lx, F5.6, 3200K	400 lx, F5.6, 3200K		
S/N	50 dB		45 dB		50 dB			
Electric shutter	Mode	OFF / Auto (AES) / Manual (PRESET or VARIABLE), OFF is normal exposure (frame rate)						
	PRESET	1/22, 1/100, 1/200, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second		1/53, 1/100, 1/250, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second		1/200, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/50000 second		
	VARIABLE	10 to 1/100,000 second						
External trigger	Mode	Fixed shutter (9 steps or Variable)		Fixed shutter (8 steps or Variable)				
	Input	Via Gigabit Ethernet cable (Software trigger), 6-pin connector (Hardware trigger)						
External sync signal	VD output: 5 Vp-p ±0.3 V, Strobe out: 5 Vp-p ±0.3 V							
Partial scan	Selectable start position and width of picture grabbing in 1 pixel step					Selectable start position and width of picture grabbing in 1H step		
Binning mode	OFF/ON (Vertical)							
ALC (Auto level control)	Adjustable for video level							
White balance	ATW / MANUAL / One-Push	–	ATW / MANUAL / One-Push	–	ATW / MANUAL / One-Push	–		
Color masking	OFF / ON (6 vector independent masking)	–	OFF / ON (6 vector independent masking)	–	OFF / ON (6 vector independent masking)	–		
Gain	0 to 18 dB by 0.1 dB steps							
Gamma	OFF (γ=1) / LUT (0.45 to 1)							
Image adjustment function	Sharpness, Black level, Knee							
Power supply	DC +12 to 24 V ±1 V (via 6 pin connector), 48V(PoE)							
Power consumption	Approx. 7.5 W (625 mA) (DC12 V)		Approx. 4.2 W (350 mA) (DC12 V)		Approx. 3.5 W (292 mA) (DC12 V)			
Ambient temperature	Performance	0 °C to +40 °C (+32 °F to 104 °F), 90 %RH or less						
	Operation	–10 °C to +50 °C (+14 °F to 122 °F), 90 %RH or less						
	Storage	–20 °C to +60 °C (–4 °F to 140 °F), 70 %RH or less, (without dew condensation)						
Vibration endurance	15 to 200 to 15 Hz (98.6 m/S ²), 10 minutes for each 3 axis							
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)							
External dimensions	44(W) x 44(H) x 41(D) mm (not including lens and protrusions)			29(W) x 29(H) x 35(D) mm (not including lens and protrusions)				
Mass	Approx. 130 g (without lens)			Approx. 50 g (without lens)				

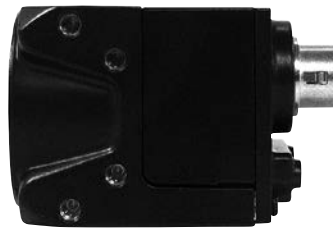
Digital Interface Cameras

KP-FM500UB	USB3 Vision	1CMOS Black & Withe	2/3" CMOS	5.01 M Pixels (2448 x 2048)	Max. 60 frames per sec.	44(W) x 44(H) x 41(D) mm
KP-FMD500UB		1CMOS Color (RGB/YUV/RAW)				
KP-FM200UB		1CMOS Black & Withe	1/1.8" CMOS	UXGA (1.92 M Pixels) (1600 x 1200)	Max. 53 frames per sec.	29(W) x 29(H) x 35(D) mm
KP-FMD200UB		1CMOS Color (RGB/YUV/RAW)				
KP-F32UB		1CCD Black & Withe	1/3" CCD	VGA (0.32 M Pixels) (652 x 490)	Max. 200 frames per sec.	
KP-FD32UB		1CCD Color (RGB/YUV/RAW)				

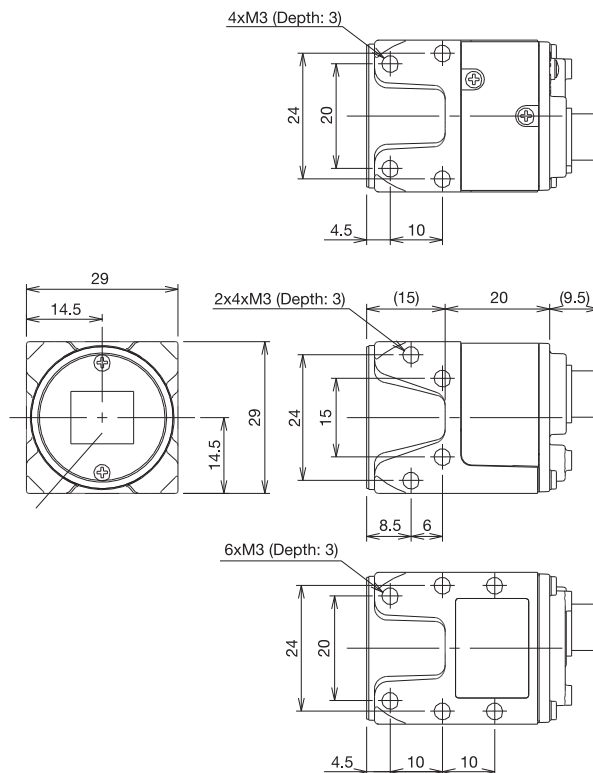
KP-FM200UB, KP-FMD200UB, KP-F32UB, KP-FD32UB



Actual Size



Rear View



Unit: mm

Digital Interface Cameras

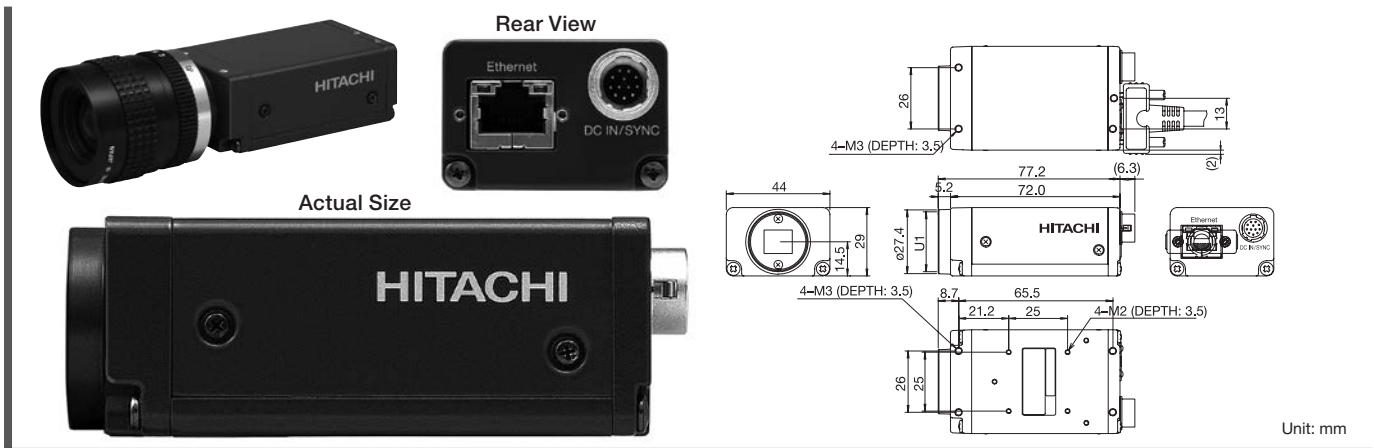
		KP-FMD500UB	KP-FM500UB	KP-FMD200UB	KP-FM200UB	KP-FD32UB	KP-FD32UB
Imaging device		2/3-inch CMOS		1/1.8-inch CMOS		1/3-inch CCD	
	Effective pixels	2448(H) x 2048(D)		1600(H) x 1200(D)		659(H) x 494(D)	
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)		4.5 μm(H) x 4.5 μm(V) (Square pixel)		7.4 μm(H) x 7.4 μm(V) (Square pixel)	
	Color filter	RGB primary color mosaic filter	–	RGB primary color mosaic filter	–	RGB primary color mosaic filter	–
Scanning area	8.45 mm(H) x 7.07 mm(V)		7.2 mm(H) x 5.4 mm(V)		4.88 mm(H) x 3.66 mm(V)		
Scanning system	Progressive						
Sync system	Internal						
Lens mount	C-mount (Flange focal distance: 17.526 mm)						
Video output	Interface	USB 3.0 Interface					
	Protocol	USB3 Vision compliant					
	Image format	RGB 24/30/36 bit, YUV(4:2:2) 24/30/36 bit RAW 8/10/12 bit Mono 8/10/12 bit	Mono 8/10/12 bit	RGB 24/30/36 bit, YUV(4:2:2) 24/30/36 bit RAW 8/10/12 bit Mono 8/10/12 bit	Mono 8/10/12 bit	RGB 24/30/36 bit, YUV(4:2:2) 24/30/36 bit RAW 8/10/12 bit Mono 8/10/12 bit	Mono 8/10/12 bit
	Image size	2448(H) x 2048(D)		1600(H) x 1200(D)		652(H) x 490(D)	
	Frame rate	60 frames per second		53 frames per second		200 frames per second	
Sensitivity	2000 lx, F5.6, 3200K	400 lx, F8, 3200K	2000 lx, F5.6, 3200K	500 lx, F5.6, 3200K	2000 lx, F5.6, 3200K	400 lx, F5.6, 3200K	
S/N	50 dB		45 dB		50 dB		
Electric shutter	Mode	OFF / Auto (AES) / Manual (PRESET or VARIABLE), OFF is normal exposure (frame rate)					
	PRESET	1/22, 1/100, 1/200, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second		1/53, 1/100, 1/250, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second		1/200, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/50000 second	
	VARIABLE	10 to 1/100,000 second					
External trigger	Mode	Fixed shutter (9 steps or Variable)		Fixed shutter (8 steps or Variable)			
	Input	Via USB3.0 cable (Software trigger), 6-pin connector (Hardware trigger)					
External sync signal	VD output: 5 Vp-p ±0.3 V, Strobe out: 5 Vp-p ±0.3 V						
Partial scan	Selectable start position and width of picture grabbing in 1 pixel step				Selectable start position and width of picture grabbing in 1H step		
Binning mode	OFF/ON (Vertical)						
ALC (Auto level control)	Adjustable for video level						
White balance	ATW / MANUAL / One-Push	–	ATW / MANUAL / One-Push	–	ATW / MANUAL / One-Push	–	
Color masking	OFF / ON (6 vector independent masking)	–	OFF / ON (6 vector independent masking)	–	OFF / ON (6 vector independent masking)	–	
Gain	0 to 18 dB by 0.1 dB steps						
Gamma	OFF (γ=1) / LUT (0.45 to 1)						
Image adjustment function	Sharpness, Black level, Knee						
Power supply	DC +5 V ±5 % (via USB3.0 cable)						
Power consumption	Approx. 1.6 W (320 mA)				Approx. 1.25 W (250 mA)		
Ambient temperature	Performance	0 °C to +40 °C (+32 °F to 104 °F), 90 %RH or less					
	Operation	–10 °C to +50 °C (+14 °F to 122 °F), 90 %RH or less					
	Storage	–20 °C to +60 °C (–4 °F to 140 °F), 70 %RH or less, (without dew condensation)					
Vibration endurance	15 to 200 to 15 Hz (98.6 m/S ²), 10 minutes for each 3 axis						
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)						
External dimensions	44(W) x 44(H) x 41(D) mm (not including lens and protrusions)			29(W) x 29(H) x 20(D) mm (not including lens and protrusions)			
Mass	Approx. 130 g (without lens)			Approx. 60 g (without lens)			

Digital Interface Cameras

KP-FD500GV	GigE Vision	1CCD Color (RGB/YUV/RAW)	2/3" CCD	5.01 M Pixels (2448 x 2048)	Max. 9 frames per sec. (YUV)	44(W) x 29(H) x 72(D) mm
KP-F500GV		1CCD Black & White			Max. 16 frames per sec.	
KP-FD202GV		1CCD Color (RGB/YUV/RAW)	1/1.8" CCD	UXGA (2.01 M Pixels) (1628 x 1236)	Max. 30 frames per sec. (RAW)	
KP-F202GV		1CCD Black & White			Max. 30 frames per sec.	
KP-F145GV		1CCD Black & White (Near infrared sensitivity)	2/3" CCD	SXGA (1.45 M Pixels) (1392 x 1040)	Max. 30 frames per sec.	
KP-FD140GV		1CCD Color (RGB/YUV/RAW)	1/2" CCD		Max. 30 frames per sec. (YUV)	
KP-F140GV		1CCD Black & White			Max. 30 frames per sec.	
KP-FD83GV		1CCD Color (RGB/YUV/RAW)	1/3" CCD	XGA (0.81 M Pixels) (1034 x 779)	Max. 36 frames per sec.	
KP-F83GV		1CCD Black & White				
KP-FD33GV		1CCD Color (RGB/YUV/RAW)		VGA (0.33 M Pixels) (659 x 494)	Max. 90 frames per sec.	
KP-F33GV	1CCD Black & White					

		KP-FD500GV KP-F500GV	KP-FD202GV KP-F202GV	KP-F145GV
Imaging device		2/3-inch progressive scan interline CCD (KP-FD500GV: ICX625AQ, KP-F500GV: ICX625ALA)	1/1.8-inch progressive scan interline CCD (KP-FD202GV: ICX274AQ, KP-F202GV: ICX274A)	2/3-inch progressive scan interline CCD (ICX285AL)
	Total pixels	2448(H) x 2048(V)	1688(H) x 1248(V)	1432(H) x 1050(V)
	Effective pixels	2448(H) x 2048(V)	1628(H) x 1236(V)	1392(H) x 1040(V)
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)	4.4 μm(H) x 4.4 μm(V) (Square pixel)	6.45 μm(H) x 6.45 μm(V) (Square pixel)
	Color filter (FD Model)	RGB primary color mosaic filter		-
Scanning area		8.47 mm(H) x 7.10 mm(V)	7.13 mm(H) x 5.44 mm(V)	8.98 mm(H) x 6.71 mm(V)
Scanning system		Progressive		
Sync system		Internal / external		
Lens mount		C-mount (Flange focal distance: 17.526 mm)		
Video output	Interface	Gigabit Ethernet		
	Protocol	GigE Vision compliant		
	Transfer rate	1 Gbps		
	Image format	KP-FD500GV/FD202GV: RGB 8/10/12 bit, YUV 8/10/12 bit, RAW 8/10/12 bit, MONO 8/10/12 bit		MONO 8/10/12 bit
	Image size	2448(H)x 2048(V)	1620(H)x 1220(V)	1392(H)x 1040(V)
	Frame rate	Full pixel readout KP-F500GV: 16 frames per second KP-FD500GV: 9 frames per second (YUV 8 bit, RAW 8/10/12 bit) 7 frames per second (RGB 8 bit, YUV 10/12 bit) 5 frames per second (RGB 10 bit) 3 frames per second (RGB 12 bit)	Full pixel readout KP-F202GV: 30 frames per second KP-FD202GV: 30 frames per second (RAW 8 bit) 28 frames per second (YUV 8 bit, RAW 10/12 bit) 18 frames per second (RGB 8 bit, YUV 10/12 bit) 12 frames per second (RGB 10 bit) 9 frames per second (RGB 12 bit)	30 frames per second
Sensitivity		KP-FD500GV: 2000 lx, F8, 3200K KP-F500GV: 400 lx, F8, 3200K	KP-FD202GV: 2000 lx, F8, 3200K KP-F202GV: 2000 lx, F11, 3200K	400 lx, F5.6, 3200K
Electric shutter		OFF/Auto (AES) / Manual (PRESET or VARIABLE), OFF is normal exposure (frame rate)		
	PRESET	1/9(KP-FD500GV), 1/16(KP-F500GV), 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	
External trigger	VARIABLE	From 10 second to approx. 1/100000 second		
	Mode	Fixed shutter, One trigger, VD Sync, Reset control		
External sync signal	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)		
	Input level	+5 to 24 V		
External sync signal	VD output	5 Vp-p ±0.3 V		
	Strobe out	5 Vp-p ±0.3 V		
Binning mode (No FD model)		OFF / ON		
Partial scan		Grabbing image area is adjustable at 1 pixel step. Frame rate improves when vertical size is reduced.		
ALC (Auto level control)		Adjustable for video level		
White balance (FD model)		ATW/MANUAL/One-push		-
Gain		Auto / Manual (0 dB to 12 dB)	Auto / Manual (0 dB to 18 dB)	
Gamma		OFF(γ=1)/LUT		
Image adjustment function		Sharpness, black level, knee		
		In addition to the above, FD model color masking (6 color independent masking), painted black		
Power supply		DC+12 V ±1 V (input from 12-pin connector), 48 V (PoE)		
Power consumption	Normal	KP-FD500GV: Approx. 7.5 W (Approx. 625 mA) KP-F500GV: Approx. 7.8 W (Approx. 650 mA)	KP-FD202GV: Approx. 7.8 W (Approx. 650 mA) KP-F202GV: Approx. 7.5 W (Approx. 625 mA)	Approx. 6.0 W (Approx. 500 mA)
	Partial scan	KP-FD500GV: Approx. 7.8W (Approx. 650mA) KP-F500GV: Approx. 8.4W (Approx. 700mA) (at 2 pixel height)	KP-FD202GV: Approx. 8.5W (Approx. 710mA) KP-F202GV: Approx. 8.4W (Approx. 700mA) (at 2 pixel height)	Approx. 6.6W (Approx. 550mA) (at 2 pixel height)
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less		
	Operating	-10 °C to +50 °C / 90 %RH or less		
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)		
Vibration endurance		15 to 200 to 15 Hz (98.6m/S ²), 10 minutes for each 3 axis		
Shock endurance		490.3 m/s ² (Once for each side of top, under, left and right)		
External dimensions		44(W) x 29(H) x 72(D) mm (not including lens and protrusions)		
Mass		Approx. 140 g (without lens)		

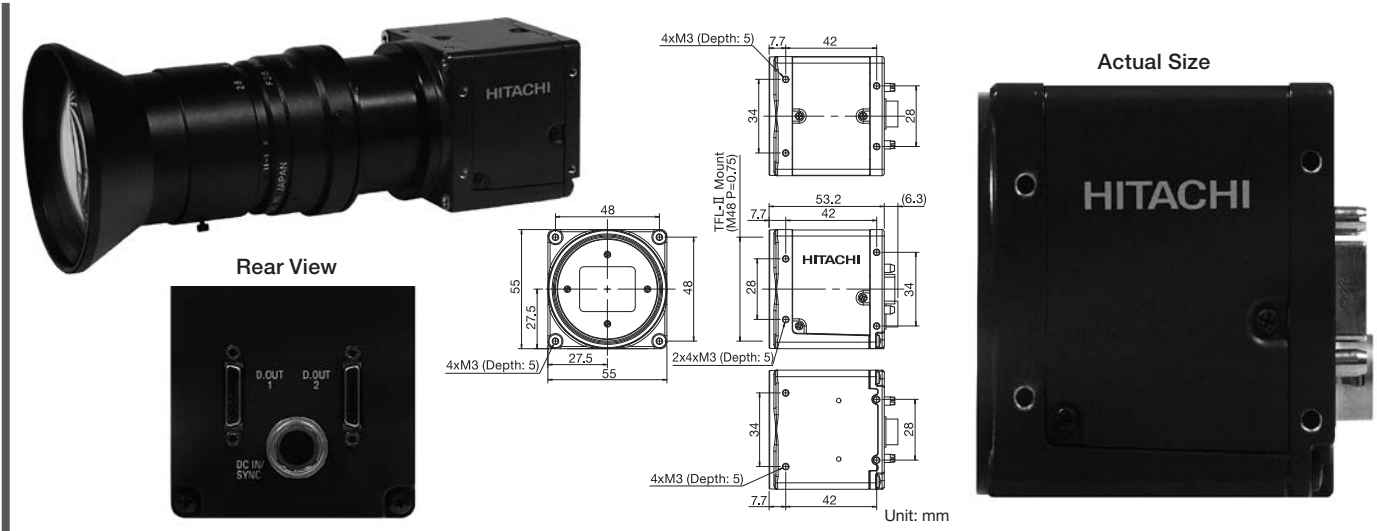
Digital Interface Cameras



		KP-FD140GV KP-F140GV	KP-FD83GV KP-F83GV	KP-FD33GV KP-FD33GV
Imaging device		1/2-inch progressive scan interline CCD (KP-FD140GV: ICX267AK, KP-F140GV: ICX267AL)	1/1.8-inch progressive scan interline CCD (KP-FD83GV: ICX204AK, KP-F83GV: ICX204AL)	1/3-inch progressive scan interline CCD (KP-FD33GV: ICX424AQ, KP-F33GV: ICX424AL)
	Total pixels	1434(H) x 1050(V)	1077(H) x 788(V)	692(H) x 504(V)
	Effective pixels	1392(H) x 1040(V)	KP-FD83GV: 1034(H) x 779(V) KP-F83GV: 1036(H) x 779(V)	659(H) x 494(V)
	Pixel size	4.65 μm(H) x 4.65 μm(V) (Square pixel)		7.4 μm(H) x 7.4 μm(V) (Square pixel)
Color filter (FD Model)	RGB primary color mosaic filter			—
Scanning area	6.32 mm(H) x 4.76 mm(V)		4.76 mm(H) x 3.57 mm(V)	4.88 mm(H) x 3.66 mm(V)
Scanning system	Progressive			
Sync system	Internal / external			
Lens mount	C-mount (Flange focal distance: 17.526 mm)			
Video output	Interface	Gigabit Ethernet		
	Protocol	GigE Vision compliant		
	Transfer rate	1 Gbps		
	Image format	KP-FD140GV/FD83GV/FD33GV: RGB 8/10/12 bit, YUV 8/10/12 bit, RAW 8/10/12 bit, MONO 8/10/12 bit KP-F140GV/F83GV/F33GV: MONO 8/10/12 bit		
Image size	1360(H) x 1024(V)	1024(H) x 768(V)	659(H) x 492(V)	
Frame rate	Full pixel readout KP-F140GV: 30 frames per second KP-FD140GV: 30 frames per second (YUV 8 bit, RAW 8/10/12 bit) 26 frames per second (RGB 8 bit, YUV 10/12 bit) 18 frames per second (RGB 10 bit) 13 frames per second (RGB 12 bit)	Full pixel readout KP-F83GV: 36 frames per second KP-FD83GV: 36 frames per second (RGB 8 bit, YUV 8/10/12 bit, RAW 8/10/12 bit) 35 frames per second (RGB 10 bit) 24 frames per second (RGB 12 bit)	Full pixel readout KP-F33GV: 90 frames per second KP-FD33GV: 90 frames per second (RGB 8 bit, YUV 8/10/12 bit, RAW 8/10/12 bit) 85 frames per second (RGB 10 bit) 55 frames per second (RGB 12 bit)	
Sensitivity	KP-FD140GV/FD83GV/FD33GV: 2000 lx, F5.6, 3200K KP-F140GV/F83GV/F33GV: 2000 lx, F11, 3200K			
Electric shutter		OFF/Auto (AES) / Manual (PRESET or VARIABLE), OFF is normal exposure (frame rate)		
	PRESET	1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/36, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second	1/90, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second
External trigger	Mode	Fixed shutter, One trigger, VD Sync, Reset control		
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)		
External sync signal	Input level	+5 to 24 V		
	VD output	5 Vp-p ±0.3 V		
External sync signal	Strobe out	5 Vp-p ±0.3 V		
	Binning mode (No FD model)	OFF / ON		
Partial scan	Grabbing image area is adjustable at 2 pixel step. Frame rate improves when vertical size is reduced.			
ALC (Auto level control)	Adjustable for video level			
White balance (FD model)	ATW/MANUAL/One-push			—
Gain	Auto / Manual (0 dB to 12 dB)		Auto / Manual (0 dB to 18 dB)	
Gamma	OFF(γ=1)/LUT			
Image adjustment function	Sharpness, Black level			
Power supply	In addition to the above, FD model color masking (6 color independent masking), painted black, knee DC+12 V ±1 V (input from 12-pin connector), 48 V (PoE)			
Power consumption	Normal	KP-FD140GV: Approx. 6.0 W (Approx. 500 mA) KP-F140GV: Approx. 5.5 W (Approx. 450 mA)	KP-FD83GV: Approx. 4.3 W (Approx. 360 mA) KP-F83GV: Approx. 4.1 W (Approx. 340 mA)	KP-FD33GV: Approx. 4.7 W (Approx. 390 mA) KP-F33GV: Approx. 4.3 W (Approx. 360 mA)
	Partial scan	KP-FD140GV: Approx. 7.0 W (Approx. 580 mA) KP-F140GV: Approx. 6.5 W (Approx. 540 mA) (at 2 pixel height)	KP-FD83GV: Approx. 4.7 W (Approx. 390 mA) KP-F83GV: Approx. 4.8 W (Approx. 400 mA) (at 2 pixel height)	KP-FD33GV: Approx. 5.2 W (Approx. 430 mA) KP-F33GV: Approx. 5.0 W (Approx. 420 mA) (at 2 pixel height)
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less		
	Operating	-10 °C to +50 °C / 90 %RH or less		
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)		
Vibration endurance	15 to 200 to 15 Hz (98.6m/S ²), 10 minutes for each 3 axis			
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)			
External dimensions	44(W) x 29(H) x 72(D) mm (not including lens and protrusions)			
Mass	Approx. 140 g (without lens)			

Digital Interface Cameras

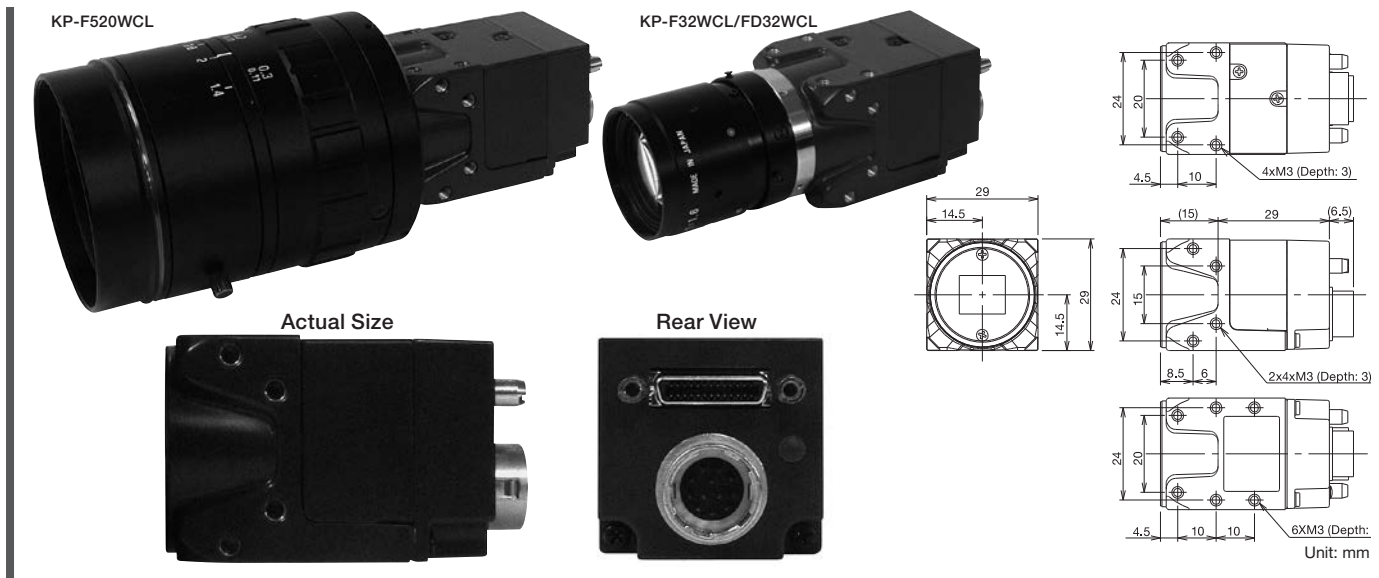
KP-FM1200CL	Mini CL (non-PoCL)	1CMOS Black & White	1.7" CMOS	12.58 M pixels (4096 x 3072)	Max. 53 frames per sec.	55(W) x 55(H) x 45(D) mm
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Imaging device	Effective pixels	1.7-inch global shutter system CMOS (CMV12000)	
	Pixel size	4096(H) x 3072(V)	
Sensing area		5.5 μm(H) x 5.5 μm(V) (square lattice)	
Scanning system		22.5 mm (H) x 16.9 mm (V)	
Aspect ratio		Progressive	
Frame rate (Max.)		4 : 3	
Horizontal drive frequency		53 frames per second (full pixel readout)	
Horizontal Scanning frequency		42.0000 MHz	
Vertical Scanning frequency		Full configuration (84 MHz): 162.79 kHz Medium configuration (84 MHz): 81.396 kHz Base configuration (84 MHz): 40.698 kHz	Full configuration (42 MHz): 81.396 kHz Medium configuration (42 MHz): 40.698 kHz Base configuration (42 MHz): 20.348 kHz
Vertical subsampling Modes		Full configuration (84 MHz): 52.752 Hz Medium configuration (84 MHz): 26.426 Hz Base configuration (84 MHz): 13.226 Hz	Full configuration (42 MHz): 26.426 Hz Medium configuration (42 MHz): 13.226 Hz Base configuration (42 MHz): 6.615 Hz
Sync system		OFF (1 times) / 2 times / 3 times / 4 times / 5 times / 6 times / 7 times / 8 times / 9 times / 10 times	
Lens mount		Internal	
Video output		TFL-II Mount (Flange focal distance =17.5 mm), (F-mount adaptor: Option)	
Resolution		Base configuration 2TAP (84 MHz or 42 MHz) Medium configuration 4TAP (84 MHz or 42 MHz) Full configuration 8TAP (84 MHz or 42 MHz) Output image size: 4096(H)x3072(V)(pixel readout)	
Sensitivity		Horizontal/Vertical: 3000 TV lines	
S/N		400 lx, F5.6, 3200 K (Exposure time: 100μs)	
Electric shutter		48 dB	
Gain		OFF, 1/60, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000, 1/20000 second OFF is normal exposure (frame rate) or changeable by variable shutter (40.5 μs to 1.0 s, 49.1 μs step)	
Offset level		1 to 4 times	
Gamma		0/255 to 127/255	
Frame on demand	Mode	γ=1	
	Trigger input	Fixed shutter (8 steps or variable), ONE trigger mode Camera Link (CC1) or DCIN/SYNC connector	
Partial scan		Selectable start position and height of picture grabbing in 4H step, Up to 8 areas can be set	
Pulse output		OFF/FLASH OUT/VD OUT	
Power supply voltage		12 ± 1 VDC	
Current consumption		Approx. 330 mA (approx. 4 W)	
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH	
	Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH	
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH, without dew condensation	
Vibration endurance		10 to 55 Hz (2.37 to 71.7 m/S ²), Sweep 1 minute, 30 minutes for each 3 axis	
Shock endurance		490.3 m/s ² (Once for each side of top, under, left and right)	
External dimensions		55 (W) x 55 (H) x 45 (D) mm (Not including mount protrusions)	
Mass		Approx. 250 g	

Digital Interface Cameras

KP-F520WCL	Mini CL (Auto Selection of PoCL or non-PoCL)	1CCD Black & White	2/3" CCD	5.01 M Pixels (2448 x 2048)	Max. 18 frames per sec.	29(W) × 29(H) × 29(D)mm
KP-FD32WCL		1CCD Color (RGB/YUV/RAW)	1/3" CCD	VGA (0.33 M Pixels) (660 x 494)	Max. 200 frames per sec.	
KP-F32WCL		1CCD Black & White				



		KP-F520WCL	KP-FD32WCL	KP-F32WCL
Imaging device		2/3-inch progressive scan interline CCD		1/3-inch progressive scan interline CCD
	Effective pixels	2448(H) x 2048(V)		660(H) x 494(V)
	Pixel size	3.45 μm (H) x 3.45 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)		4.88 mm (H) x 3.66 mm (V)	
Scanning system	Progressive			
Aspect ratio	5 : 4		4 : 3	
Frame rate	18 frames per second (full pixel readout)		200 frames per second (full pixel readout)	
Horizontal drive frequency	72.000 MHz		60.000 MHz	
Horizontal Scanning frequency	37.422 kHz		101.18 kHz	
Vertical Scanning frequency	18.00 Hz 45.046 Hz (vertical 2 pixel addition)		200.35 Hz	
Sync system	Internal			
Lens mount	C-mount (Flange focal distance = 17.526 mm)			
Video output		Camera Link Base configuration: 72.000 MHz x 2TAP	Camera Link Base configuration: 80.000 MHz	Camera Link Base configuration: 40.000 MHz x 2TAP
		8 bit / 10 bit / 12 bit		
		Output image size: 2448(H) x 2048(V) (full pixel readout)		Output image size: 660(H) x 494(V) (full pixel readout)
Resolution	Horizontal / Vertical: 2000 TV Line		Horizontal / Vertical: 490 TV Line	
Sensitivity	400 lx, F8, 3200K		2000 lx, F5.6, 3200K 400 lx, F4, 3200K	
Minimum illumination	2.0 lx (F1.4, MAX GAIN)			
Signal noise to ratio	50 dB			
Electric shutter	OFF, 1/18, 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, 1/200, 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 or Variable			
Frame on demand	Mode	Fixed shutter mode (8 steps or variable) , ONE trigger mode, VD reset mode		
	Trigger input	Camera Link (CC1) or DCIN/SYNC connector		
Partial scan	Selectable start position and height of picture grabbing in 1H step.			
Pulse output	OFF, FLASH OUT or VD OUT			
White balance	-		ATW/MANUAL/One-push	
Binning mode	-		OFF / ON (vertical)	
Image adjustmant function	White flaw correction, Left and right balance adjustment, Knee adjustmant		Sharpness, 6 color independent masking, brightness	
Power supply voltage	12 ± 1 VDC			
Current consumption	Approx. 265 mA (Approx. 3.18 W)		Approx. 250 mA (Approx. 3 W)	
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	-10 to +50 °C (+14 to +122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to +140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	10 to 55 Hz (2.37 to 71.7 m/S ²), Sweep 1 minute, 30 minutes for each 3 axis			
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)			
External dimensions	29 (W) x 29 (H) x 29 (D) mm (not including mount protrusions)			
Mass	Approx. 55 g			

Digital Interface Cameras

KP-FD510WCL	Mini CL (Auto Selection of PoCL or non-PoCL)	1CCD Color (RGB)	2/3" CCD	5.01 M Pixels (2448 x 2048)	Max. 12 frames per sec.	44(W) x 44(H) x 41(D) mm
KP-FR500WCL		1CCD Color (RAW)			Max. 16 frames per sec.	
KP-F500WCL		1CCD Black & White				
KP-FD500PCL/SCL	PCL: Mini CL(PoCL)	1CCD Color (RGB)	1/1.8" CCD	UXGA(2.01M Pixels) (1628 x 1236)	Max. 30 frames per sec.	
KP-FD202PCL/SCL	SCL: Mini CL(Non-PoCL)		1/2" CCD	SXGA(1.45M Pixels) (1392 x 1040)		
KP-FD140PCL/SCL	Mini CL (Auto Selection of PoCL or non-PoCL)		2/3" CCD			

KP-FD510WCL



Rear View



KP-F500WCL, KP-FR500WCL,
KP-FD500PCL/SCL, KP-F145WCL



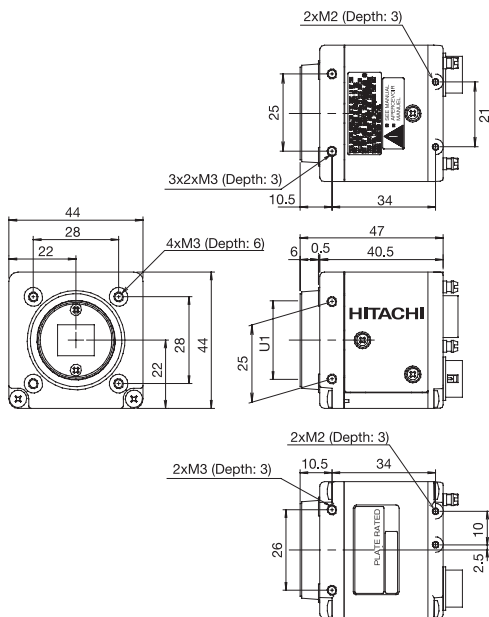
Actual Size



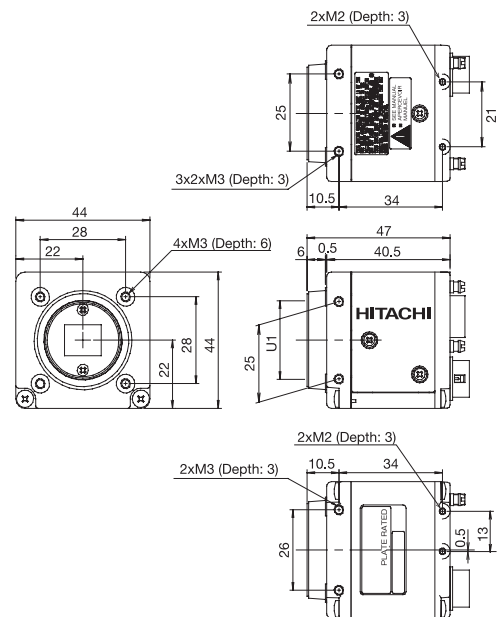
KP-FD202PCL/SCL,
KP-FD140PCL/SCL



KP-F500WCL, KP-FR500WCL, KP-FD500PCL/SCL,
KP-F145WCL, KP-FD202PCL/SCL, KP-FD140PCL/SCL



KP-FD510WCL



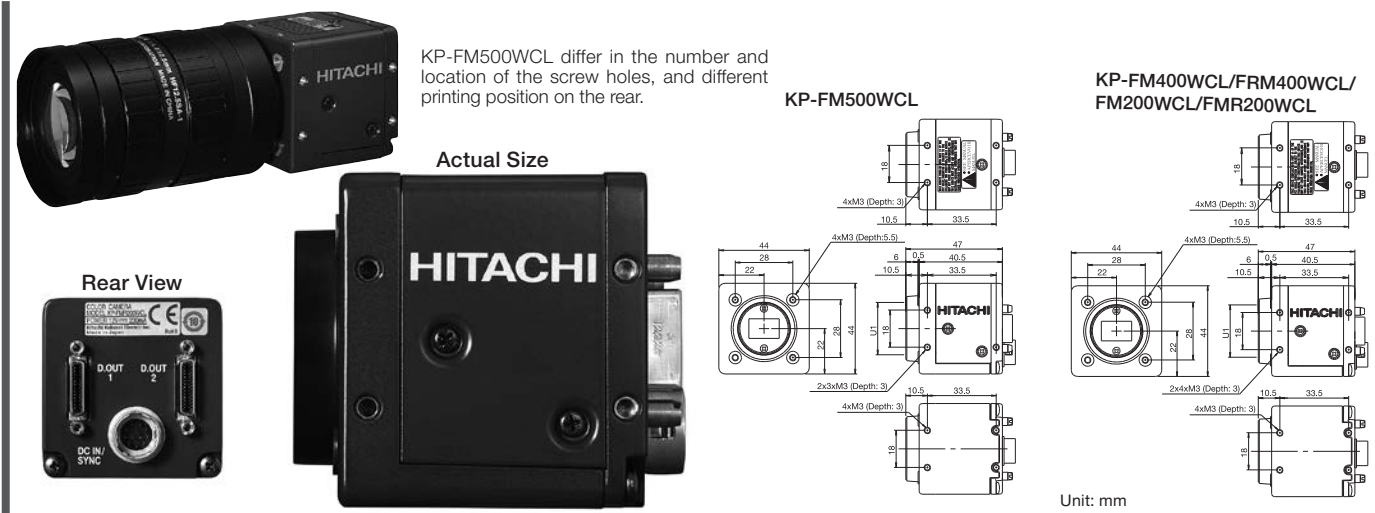
Unit: mm

Digital Interface Cameras

		KP-FD510WCL KP-FD500PCL/SCL	KP-FR500WCL KP-F500WCL	KP-FD202PCL/SCL	KP-FD140PCL/SCL	KP-145WCL
Imaging device		2/3-inch progressive scan interline CCD (ICX625AQ)		1/1.8-inch progressive scan interline CCD (ICX274AQ)	1/2-inch progressive scan interline CCD (ICX267AK)	2/3-inch progressive scan interline CCD (ICX285AL)
	Total pixels	2448(H) x 2048(V)		1688(H) x 1248(V)	1434 (H) x 1050 (V)	1432 (H) x 1050 (V)
	Effective pixels	2448(H) x 2048(V)		1628(H) x 1236(V)	1392 (H) x 1040 (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 (FR/FD model)	RGB primary color mosaic filter					–
Sensing area	8.45 mm (H) x 7.07 mm (V)		8.47 mm (H) x 7.10 mm (V)	7.13 mm (H) x 5.37 mm (V)	6.32 mm (H) x 4.76 mm (V)	8.98 mm (H) x 6.71 mm (V)
Scanning system	Progressive					
Aspect ratio	5 : 4			4 : 3		
Frame rate	12 frames per second (full pixel readout)	16 frames per second (full pixel readout) 32 frames per second (vertical 2 pixel addition) FR model: No vertical 2 pixel addition)	30 frames per second (full pixel readout)	30 frames per second (full pixel readout)		30 frames per second (full pixel readout) 60 frames per second (vertical 2 pixel addition)
Horizontal drive frequency	48.0000 MHz		64.0000 MHz	72.0000 MHz	57.6000 MHz	
Horizontal Scanning frequency	24.922 kHz		33.264	37.5 kHz	32.179 kHz	
Vertical Scanning frequency	11.99 Hz	16.00 Hz (full pixel readout) 31.98 Hz (vertical 2 pixel addition mode) FR model: No vertical 2 pixel addition)	29.95 Hz	30.13 Hz		30.03 Hz (full pixel readout) 59.95 Hz (vertical 2 pixel addition mode)
Sync system	Internal					
Lens mount	C-mount (Flange focal distance = 17.526 mm)					
Video output	Interface/ Protocol	Camera Link 64.0000 MHz Base configuration (1ch: SDR connector x 1pc.) Medium configuration (2ch: SDR connector x 2pcs)	Camera Link Base configuration: 64.0000 MHz x 2TAP Medium configuration: 32.0000 MHz x 4TAP	Camera Link 72.0000 MHz	Camera Link 57.6000 MHz	Camera Link Base configuration: 28.8000 MHz x 2TAP
	Output format	24 bits (Base configuration) 30 bits (Medium configuration) 36 bits (Medium configuration)	8 bit / 10 bit / 12 bit	24 bits (Base configuration) 30 bits (Medium configuration) 36 bits (Medium configuration)	8 bit / 10 bit / 12 bit	
	Output image size	2448 (H) x 2048 (V) (full pixel readout)	2448(H) x 2048(V) (full pixel readout)	1620(H) x 1220(V) (full pixel readout)	1360(H) x 1024(V) (full pixel readout)	1392(H) x 1040(V) (full pixel readout)
Sensitivity	2000 lx, F11, 3200 K		500 lx, F11, 3200 K FR Model: 2000 lx, F8, 3200K	2000 lx, F5.6, 3200 K		400 lx, F8, 3200 K
Minimum illumination	5 lx (F1.4, MAX GAIN)		1.0 lx (F1.4, MAX GAIN) FR model: 15 lx (F1.4 GAIN MAX)	10 lx (F1.4, MAX GAIN)		2.0 lx (F1.4, MAX GAIN)
Signal noise to ratio	48 dB					
Electric shutter	OFF, 1/12, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (from 10 to 1/100000 second)		OFF, 1/16, 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 (from 10 to 1/100000 second)	OFF, 1/30, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (from 10 to 1/100000 second)		
Frame on demand	Mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode				
	Trigger input	Camera Link (CC1) or DCIN/SYNC connector				
Partial scan	Selectable start position and height of picture grabbing in 1H step.					
ALC (Auto level control)	Mode: AGC (Auto gain control), AES (Auto electric shutter), AGC & AES Video Level: Adjustable		–	Mode: AGC (Auto gain control), AES (Auto electric shutter), AGC & AES Video Level: Adjustable		–
Gain	Auto/Manual (0 to +12 dB) (Approx. 0.0358 dB step)		Auto/Manual (0 to +18dB) (Approx. 0.0358 dB step)	Auto/Manual (0 to +18 dB) (Approx. 0.0358 dB step)		Auto/Manual (-6 to +18 dB) (Approx. 0.0358 dB step)
White balance	ATW / MANUAL / One-push		–	ATW / MANUAL / One-push		–
Gamma	OFF (γ=1) / LUT		γ=1	OFF (γ=1) / LUT		γ=1
Color masking	OFF / ON (6 vector independent masking)		–	OFF / ON (6 vector independent masking)		–
Paint black	Adjustable		–	Adjustable		–
Sharpness	Adjustable		–	Adjustable		–
Brightness	Adjustable		–	Adjustable		–
Knee	Adjustable		–	Adjustable		–
Power supply voltage	12 ± 1 VDC					
Current consumption	Approx. 310 mA (Approx. 3.7 W)		Approx. 260 mA (Approx. 3.1 W) *MAX partial scan 1H: Approx. 330 mA (Approx. 4.0 W)	Approx. 340 mA (Approx. 4.1 W) *MAX partial scan 1H: Approx. 415 mA (Approx. 5.0 W)	Approx. 300 mA (Approx. 3.6 W)	Approx. 230 mA (Approx. 2.8 W) *MAX partial scan 1H: Approx. 350 mA (Approx. 4.2 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH				
	Operation	–10 to +50 °C (+14 to +122 °F), less than 90 % RH				
	Storage	–20 to +60 °C (–4 to +140 °F), less than 70 % RH (without dew condensation)				
Vibration endurance	10 to 55 Hz (2.37 to 71.7 m/S ²), Sweep 1 minute, 30 minutes for each 3 axis					
Shock endurance	490.3 m/s ² (Once for each side of top, under, left and right)					
External dimensions	44 (W) x 44 (H) x 41 (D) mm (not including mount protrusions)					
Mass	Approx. 110 g					

Digital Interface Cameras

KP-FM500WCL	Mini CL (Auto Selection of PoCL or non-PoCL)	1CMOS Black & White	2/3" CMOS	5.01 M pixels (2448 x 2048)	Max. 163 frames per sec.	44(W) x 44(H) x 41(D)mm
KP-FMR400WCL		1CMOS Color (RAW)	1" CMOS	4.19 M pixels (2048 x 2048)	Max. 150 frames per sec.	
KP-FM400WCL		1CMOS Black & White				
KP-FMR200WCL		1CMOS Color (RAW)	2/3" CMOS	2.23 M pixels (2048 x 1088)	Max. 280 frames per sec.	
KP-FM200WCL		1CMOS Black & White				



		KP-FM500WCL	KP-FMR400WCL KP-FM400WCL	KP-FMR200WCL KP-FM200WCL
Imaging device		2/3-inch global shutter CMOS	1-inch global shutter CMOS (CMV4000)	2/3-inch global shutter CMOS (CMV2000)
	Effective pixels	2448 (H) x 2048 (V)	2048 (H) x 2048 (V)	2048 (H) x 1088 (V)
	Pixel size	3.45 μm (H) x 3.45 μm (V) (square lattice)	5.5 μm (H) x 5.5 μm (V) (square lattice)	
	Color filter (for FMR model)	–	RGB primary color mosaic filter	
Sensing area		8.45 mm (H) x 7.07 mm (V)	11.264 mm (H) x 11.264 mm (V)	11.264 mm (H) x 5.984 mm (V)
Scanning system		Progressive		
Aspect ratio		6 : 5	1 : 1	2 : 1
Frame rate		163 frames per second (full pixel readout)	150 frames per second (full pixel readout)	280 frames per second (full pixel readout)
Pixel frequency		74.25 MHz	40.0000 MHz	
Horizontal scanning frequency	Full configuration	342.165 kHz (High speed mode, 84.857143 MHz) 303.061 kHz (84.857143 MHz) 151.530 kHz (42.4285715 MHz)	310.078 kHz (80 MHz), 155.039 kHz (40 MHz)	
	Medium configuration	132.589 kHz (84.857143 MHz) 66.295 kHz (42.4285715 MHz)	155.039 kHz (80 MHz), 77.519 kHz (40 MHz)	
	Base configuration	101.020 kHz (84.857143 MHz) 50.510 kHz (42.4285715 MHz)	77.519 kHz (80 MHz), 38.759 kHz (40 MHz)	
Vertical scanning frequency	Full configuration	163.403 Hz (High speed mode, 84.857143 MHz) 144.728 Hz (84.857143 MHz) 72.364 Hz (42.4285715 MHz)	150.523 Hz (80 MHz), 75.445 Hz (40 MHz)	281.889 Hz (80 MHz), 141.588 Hz (40 MHz)
	Medium configuration	63.319 Hz (84.857143 MHz) 31.659 Hz (42.4285715 MHz)	75.445 Hz (80 MHz), 37.768 Hz (40 MHz)	141.588 Hz (80 MHz), 70.956 Hz (40 MHz)
	Base configuration	48.243 Hz (84.857143 MHz) 24.121 Hz (42.4285715 MHz)	37.768 Hz (80 MHz), 18.896 Hz (40 MHz)	70.956 Hz (80 MHz), 35.519 Hz (40 MHz)
Sync system		Internal		
Lens mount		C-mount (Flange focal distance = 17.526 mm)		
Digital output (Camera Link)	Full configuration	10TAP (84.857143MHz or 42.4285715MHz)	8TAP (80 MHz or 40 MHz)	Full configuration 8TAP (80 MHz or 40 MHz)
	Medium configuration	4TAP (84.857143MHz or 42.4285715MHz)	4TAP (80 MHz or 40 MHz)	4TAP (80 MHz or 40 MHz)
	Base configuration	3TAP (84.857143MHz or 42.4285715MHz)	2TAP (80 MHz or 40 MHz)	2TAP (80 MHz or 40 MHz)
	Output image size	2448(H) x 2048(V) (full pixel readout)	2048(H) x 2048(V) (full pixel readout)	2048(H) x 1088(V) (full pixel readout)
Sensitivity		400 lx, F8, 3200K	KP-FMR400WCL: 2000 lx, F16, 3200K KP-FM400WCL: 400 lx, F16, 3200K	KP-FMR200WCL: 2000 lx, F11, 3200K KP-FM200WCL: 400 lx, F5.6, 3200K
Signal noise to ratio		50 dB	48 dB	
Electric shutter		OFF, 1/24, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter	OFF, 1/38, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter	OFF, 1/71, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter
Gamma		?	γ = 1	
Frame on demand	Mode	Fixed shutter mode (8 steps or variable), ONE trigger mode, Burst trigger mode		
	Trigger input	Camera Link (CC1) or DCIN/SYNC connector		
Partial scan		Selectable start position and height of picture grabbing in 1H step.		
Power supply voltage		12 ± 1 VDC		
Current consumption		Approx. 320 mA (Approx. 3.8 W)	Approx. 230 mA (Approx. 2.76 W)	
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	–20 to +60 °C (–4 to 140 °F), less than 70 % RH, without dew condensation)		
Vibration endurance		10 to 55 Hz (2.37 to 71.7 m/S ²), Sweep 1 minute, 30 minutes for each 3 axis		
Shock endurance		490.3 m/s ² (Once for each side of top, under, left and right)		
External dimensions		44 (W) x 44 (H) x 41 (D) mm(Not including mount protrusions)		
Mass		Approx. 130 g		

Digital Interface Cameras

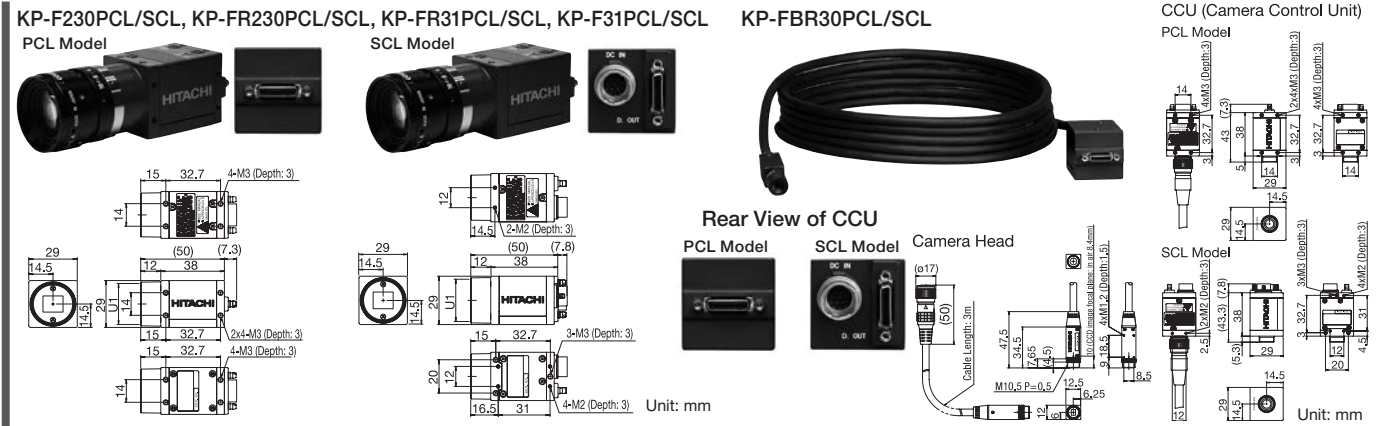
KP-FMD200PCL	Mini CL (PoCL)	1CMOS Color (RGB)	UXGA(1.92 M pixel) (1600 x 1200)	Max. 20 frames per sec.	29(W) x 29(H) x 20(D) mm
KP-FM200PCL		1CMOS Black & White		Max. 53 frames per sec.	
KP-FMD100PCL		1CMOS Color (RGB)	SXGA(1.31 M pixel) (1280 x 1024)	Max. 30 frames per sec.	
KP-FM100PCL		1CMOS Black & White		Max. 61 frames per sec.	



		KP-FMD200PCL	KP-FM200PCL	KP-FMD100PCL	KP-FM100PCL
Imaging device		1/1.8-inch CMOS		1/1.8-inch CMOS	
	Effective pixels	1600(H) x 1200(V)		1280 (H) x 1024 (V)	
	Pixel size	4.5 μm(H) x 4.5 μm(V)(square lattice)		5.3 μm(H) x 5.3 μm(V)(square lattice)	
	Color filter	RGB primary color mosaic filter	–	RGB primary color mosaic filter	–
Sensing area		7.2 mm (H) x 5.4 mm (V)		6.78 mm (H) x 5.43 mm (V)	
Scanning system		Progressive			
Aspect ratio		4 : 3		5 : 4	
Frame rate		20 frames per second (full pixel readout)	53 frames per second (full pixel readout)	30 frames per second (full pixel readout)	61 frames per second (full pixel readout)
Horizontal Drive Frequency		42 MHz	114 MHz	42 MHz	114 MHz
Horizontal scanning frequency		23.848 kHz	64.773 kHz	32.012 kHz	63.616 kHz
Vertical scanning frequency		19.563 Hz	53.180 Hz	30.72 Hz	61.052 Hz
Sync system		Internal			
Lens mount		C-mount (Flange focal distance = 17.526 mm)			
Video output		Digital output (CameraLink) (PoCL)			
		Base configuration: 42.0000 MHz		Base configuration: 57.0000 MHz x 2 TAP	
		24 bits		8 bits / 10 bits	
		Output image size: 1600 (H) x 1200 (V) (full pixel readout)		Output image size: 1280 (H) x 1024 (V) (full pixel readout)	
Sensitivity		2000lx, F5.6, 3200K	400lx, F2.8, 3200K	2000lx, F8, 3200K	400lx, F4, 3200K
S/N		45 dB			
Electric shutter		OFF, 1/60, 1/100, 1/250, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 OFF is normal exposure (frame rate) or changeable by variable shutter(Minimum 1/100000 second)			
Gamma		γ = 1			
Frame on demand	Mode	Fixed shutter mode (8 steps or variable),			
	Trigger input	Camera Link (CC1)			
Partial scan		Selectable start position and height of picture grabbing in 1 pixel step.(Minimum area: 20x20 pixels)			
Gain		Digital: 1 to 2 times (128 steps) Analog: 1/1.33/2 times			
Power supply voltage		12 ± 1 VDC			
Current consumption		Approx. 80mA (Approx. 0.96W)			
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH			
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH			
	Storage	–20 to +60 °C (–4 to 140 °F), less than 70 % RH (without dew condensation)			
Vibration endurance		10 to 200 Hz (98 m/S ²), Sweep 10 minute, 30 minutes for each 3 axis			
Shock endurance		686 m/s ² (Once for each side of top, under, left and right)			
External dimensions		29(W) x 29(H) x 20(D) mm (Not including mount protrusions)			
Mass		Approx. 35 g			

Digital Interface Cameras

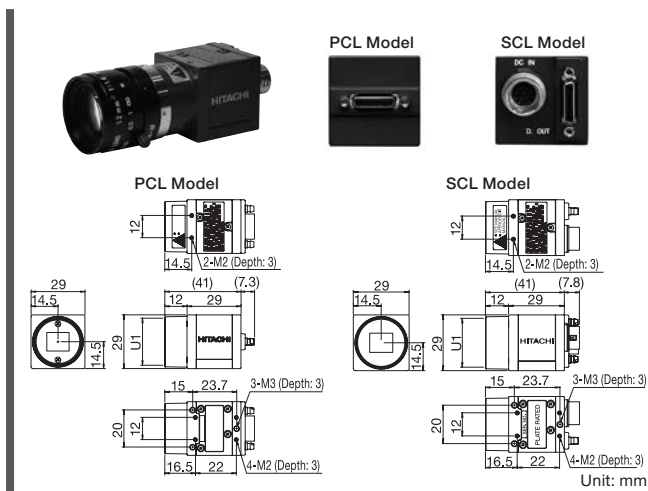
KP-FR230PCL/SCL	PCL: Mini CL(PoCL)	1CCD Color(RAW)	1/1.8"	UXGA (2.01 M pixels) (1628 x 1236)	Max. 30 frames per sec.	29(W) x 29(H) x 38(D) mm
KP-F230PCL/SCL		1CCD Black & White	CCD			
KP-FR31PCL/SCL	SCL: Mini CL (Non-PoCL)	1CCD Color(RAW)	1/3"	VGA (0.33 M Pixels) (659 x 494)	Max. 120 frames per sec.	
KP-F31PCL/SCL		1CCD Black & White				
KP-FBR30PCL/SCL		1CCD Color(RAW)			Max. 60 frames per sec.	Camera Head: 12(W) x 12.5(H) x 47.5(L)mm



		KP-FR230SCL/PCL KP-F230SCL/PCL	KP-FR31SCL/PCL KP-F31SCL/PCL	KP-FBR30SCL/PCL
Imaging device		1/1.8-inch interline CCD (ICX274AL)		1/3-inch interline CCD (ICX424AL)
	Total pixels	1688 (H) x 1248 (V)		692 (H) x 504 (V)
	Effective pixels	1628 (H) x 1236 (V)		659 (H) x 494 (V)
	Pixel size	4.4 μm (H) x 4.4 μm (V) (square lattice)		7.4 μm (H) x 7.4 μm (V) (square lattice)
Color filter (FR Model)	RGB primary color mosaic filter			
Sensing area	7.16 mm (H) x 5.44 mm (V)		4.88 mm (H) x 3.66 mm (V)	
Scanning system	Progressive			
Aspect ratio	4 : 3			
Frame rate	30 frames per second (full pixel readout) 54 frames per second (vertical 2 pixel addition) FR model: No vertical 2 pixel addition)		120 frames per second (full pixel readout) 219 frames per second (vertical 2 pixel addition) FR model: No vertical 2 pixel addition)	
Horizontal drive frequency	72.0000 MHz		49.090902 MHz	
Horizontal scanning frequency	37.5 kHz, 33.898 kHz (vertical 2 pixel addition)		62.937 kHz, 57.618 kHz (vertical 2 pixel addition)	
Vertical scanning frequency	29.95 Hz (full pixel readout) 54.06 Hz (vertical 2 pixel addition mode) FR model: No vertical 2 pixel addition)		119.88 Hz (full pixel readout) 219.08 Hz (vertical 2 pixel addition mode) FR model: No vertical 2 pixel addition)	
Sync system	Internal			
Lens mount	C-mount (Flange focal distance = 17.526 mm)			Special mount (Flange focal distance = 8.4 mm)
Video output	Digital output (Camera Link) Base configuration: 36.0000 MHz x 2 TAP (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)		Digital output (Camera Link) Base configuration: 24.545451 MHz x 2 TAP (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	
Resolution	Horizontal / Vertical: 1200 TV lines		Horizontal: 500 TV lines / Vertical: 490 TV lines	
Sensitivity	500 lx, F5.6, 3200 K FR Model: 2000 lx, F5.6, 3200 K		550 lx, F4, 3200 K FR Model: 2000 lx, F4, 3200 K	
Minimum illumination	3.9 lx (F1.4, MAX GAIN) FR Model: 20 lx (F1.4, MAX GAIN)		8.6 lx (F1.4, MAX GAIN) FR Model: 35 lx (F1.4, MAX GAIN)	
Signal noise to ratio	45 dB		50 dB	
Electric shutter	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)	
Gamma	γ=1			
Frame on demand	Mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode		
	Trigger input	Camera Link (CC1)		
Partial scan	Selectable start position and height of picture grabbing in 1H step.			
Power supply voltage	12 ± 1 VDC			
Current consumption		Approx. 270 mA (approx. 3.2 W)	Approx. 190 mA (approx. 2.3 W)	Approx. 200 mA (approx. 2.4 W)
	*MAX partial scan 1H:	Approx. 360 mA (approx. 4.3 W)	Approx. 230 mA (approx. 2.8 W)	Approx. 250 mA (approx. 3.0 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	10 to 200 Hz (98 m/s ²). Sweep 10 minute, 30 minutes for each 3 axis			
Shock endurance	686 m/s ² (Once for each side of top, under, left and right)			
External dimensions	29 (W) x 29 (H) 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. 50 g			Head: Approx. 18 g CCU: Approx. 50 g (without cable)

Digital Interface Cameras

KP-FR200PCL/SCL	PCL: Mini CL(PoCL)	1CCD Color(RAW)	1/1.8"	UXGA(2.01 M pixel) (1628 x 1236)	Max. 15 frames per sec.	29(W) x 29(H) x 29(D) mm
KP-F200PCL/SCL		1CCD Black & White	CCD			
KP-FR80PCL/SCL	SCL: Mini CL (Non-PoCL)	1CCD Color(RAW)	1/3" CCD	XGA(0.81 M pixel) (1034 x 779)	Max. 26 frames per sec.	
KP-F80PCL/SCL		1CCD Black & White				
KP-FR30PCL/SCL		1CCD Color(RAW)		VGA(0.33M pixel) (659 x 494)	Max. 60 frames per sec.	
KP-F30PCL/SCL		1CCD Black & White				



		KP-FR200PCL/SCL KP-F200PCL/SCL	KP-FR80PCL/SCL KP-F80PCL/SCL	KP-FR30PCL/SCL KP-F30PCL/SCL
Imaging device		1/1.8-inch interline CCD (ICX274AL)	1/3-inch interline CCD (ICX204AL)	1/3-inch interline CCD (ICX424AL)
	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)
	Color filter (FR Model)	RGB primary color mosaic filter		
Sensing area		7.16 mm (H) x 5.44 mm (V)	4.76 mm (H) x 3.57 mm (V)	4.88 mm (H) x 3.66 mm (V)
Scanning system		Progressive		
Aspect ratio		4 : 3		
Frame rate		15 frames per second (full pixel readout)	36 frames per second (full pixel readout)	60 frames per second (full pixel readout)
Horizontal drive frequency		36.0000 MHz		25.5454 MHz
Horizontal scanning frequency		18.75 kHz	28.346 kHz	31.468 kHz
Vertical scanning frequency		14.97 Hz	35.79 Hz	59.94 Hz
Sync system		Internal		
Lens mount		C-mount (Flange focal distance =17.526 mm)		
Video output		Digital output (Camera Link) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	Digital output (Camera Link) Base configuration: 24.5454 MHz (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)
Resolution		Horizontal / Vertical: 1200 TV lines		
Sensitivity		400 lx, F4, 3200 K FR model: 2000 lx, F8, 3200 K	400 lx, F2.8, 3200 K FR model: 2000 lx, F4, 3200 K	400 lx, F4, 3200 K FR model: 2000 lx, F5.6, 3200 K
Minimum illumination		1.0 lx (F1.4, MAX GAIN, without IR cut filter) FR model: 5.0 lx (F1.4, MAX GAIN)	1.0 lx (F1.4, MAX GAIN, without IR cut filter) FR model: 20 lx (F1.4, MAX GAIN)	1.0 lx (F1.4, MAX GAIN, without IR cut filter) FR model: 10 lx (F1.4, MAX GAIN)
Signal noise to ratio		50 dB		
Electric shutter		OFF, 1/15, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)	OFF, 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second OFF is normal exposure (frame rate) or changeable by variable shutter (minimum 1/100000 second)
Gamma		γ = 1		
Frame on demand	Mode	Fixed shutter mode (8 steps or variable) ONE trigger mode VD reset mode	Fixed shutter mode (8 steps or variable) ONE trigger mode Reset control mode VD reset mode	
	Trigger input	Camera Link (CC1) *When Reset control mode CC1 and CC2 are used		
Partial scan		Selectable start position and height of picture grabbing in 1H step.		
Power supply voltage		12 ± 1 VDC		
Current consumption		Approx. 170 mA (approx. 2.1 W)	Approx. 120 mA (approx. 1.5 W)	Approx. 120 mA (approx. 1.5 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance		10 to 200 Hz (98 m/s ²). Sweep 10 minute, 30 minutes for each 3 axis		
Shock endurance		686 m/s ² (Once for each side of top, under, left and right)		
External dimensions		29 (W) x 29 (H) x 29 (D) mm (Not including protrusions)		
Mass		Approx. 50 g		

Digital Interface Cameras

KP-FMR830CL	Between the control unit and cameras: PoCL-Lite	Cameras: 1CMOS Color (RAW) Composite image: Color (RGB)	1/3" CMOS	Cameras(Per Single camera): VGA(640 x 480) Composite image (by 8 pieces of camera): (640 x 3840)	Composite image Readout: Max. 30 frames per sec.	One Camera: 21.5(W)× 21.5(H)× 21.5(D)mm
	Composite image output from the control unit: Mini CL (Non-PoCL)					

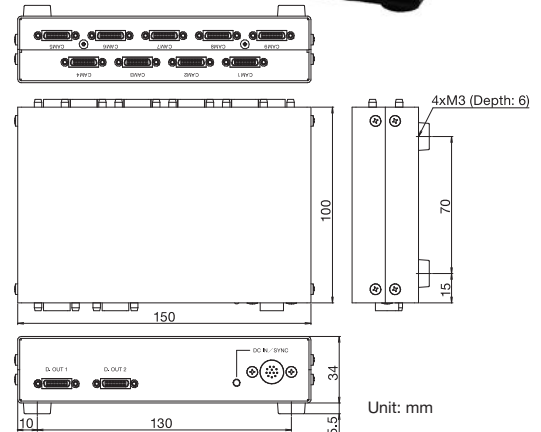
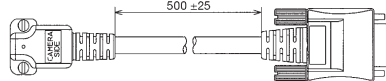
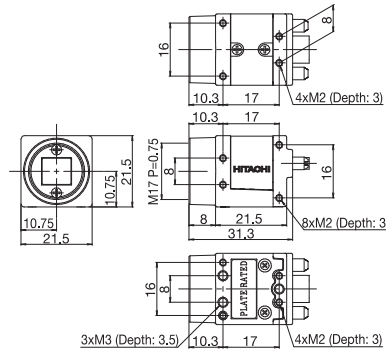
Output at 30fps (640 × 3840 pixels) by combining the color image of camera 8 units (VGA).



Camera control Unit



Actual Size



Unit: mm

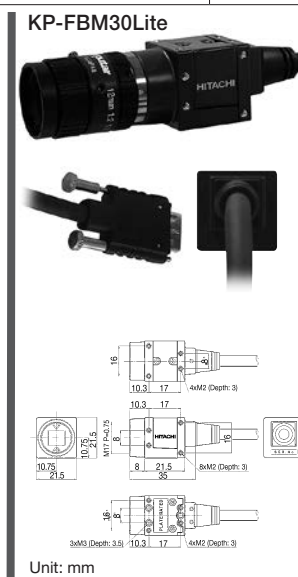
MR-FMR30Lite (Camera) (Per unit)	
Imaging device	1/3-inch CMOS
	Effective pixels 752 (H) x 480 (V)
	Pixel size 6.0 μm (H) x 6.0 μm (V) (square lattice)
	Color filter RGB primary color mosaic filter
Sensing area	4.51 mm (H) x 2.88 mm (V)
Scanning system	Progressive
Frame rate	90 frames per second (full pixel readout)
Horizontal drive frequency	36.818 MHz
Horizontal scanning frequency	45.29 kHz
Vertical scanning frequency	90 Hz
Sync system	Internal
Lens mount	NF-mount (Flange focal distance = 12 mm)
Video output	Digital output (Between the camera and the CCU): PoCL-Lite: 36.818 MHz Output image size: 752 (H) x 480 (V) (full pixel readout)
Resolution	Horizontal / Vertical: 480 TV lines
Sensitivity	500 lx, F4, 3200K
Minimum illumination	32 lx (F1.4, MAX GAIN)
Signal noise to ratio	50 dB
Electric shutter	OFF 1/90, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/20000 second, Maximum 1/90 second)
Frame on demand	Fixed shutter (7 steps or variable)
Power supply voltage	12 ± 1 VDC
Current consumption	Approx. 80 mA (Approx. 0.96 W)
Ambient temperature	Performance 0 to +40 °C (+32 to +104 °F), less than 90 % RH
	Operation -10 to +50 °C (+14 to 122 °F), less than 90 % RH
	Storage -20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)
Vibration endurance	15 to 200 Hz (98 m/s ²), Sweep 10 minute, 30 minutes for each 3 axis
Shock endurance	700 m/s ² (Once for each side of top, under, left and right)
External dimensions	21.5 (W) x 21.5 (H) x 21.5 (D) mm (Not including protrusions)
Mass	Approx. 20 g

MR-830CCU (Camera Control Unit)	
Video output	CameraLink: 80MHz Base configuration: 24bit (R:8bit G:8bit B:8bit) Output image size: 640(H) x 3840(V) (full pixel readout), 640(H) x 480(V) x Camera 8 units *Upper and lower boundary line (1 line and 480 line) of each camera is not used, please use the cut out within the 478 line
	Frame rate 30 frames per second
I/O signal	Trigger input Input from Camera Link connector: LVDS level Input from DCIN/SYNC connector: High: +2.5 to +5.0 V Low: 0 to +0.3 V
	FVAL output High: +5 V Low: 0 V
Power supply voltage	DC12 V ± 1 V
Current consumption	Approx. 1.25 mA (Approx. 15 W) (eight cameras connection)
Ambient temperature	Performance 0 to +40 °C (+32 to +104 °F), less than 90 % RH
	Operation -10 to +50 °C (+14 to 122 °F), less than 90 % RH
	Storage -20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)
Vibration endurance	15 to 200 Hz (98 m/s ²), Sweep 10 minute, 30 minutes for each 3 axis
Shock endurance	700 m/s ² (Once for each side of top, under, left and right)
External dimensions	150 (W) x 34 (H) x 100 (D) mm (Not including protrusions)
Mass	Approx. 570 g

Component		
KP-FMR830CL		
Products	Model	Quantity
Camera	MR-FM30Lite	8
PoCL-Lite cable (Camera connection: Right Angle type) (Cable length: 500mm)	MR-050Lite	8
Camera control unit	MR-830CCU	1

Digital Interface Cameras

KP-F200Lite	PoCL-Lite	1CCD	1/1.8" CCD	UXGA(2.01 M pixel)(1628 x 1236)	Max. 15 frames per sec.	29(W)×29(H)×29(D)mm
KP-F80Lite		Black & White	1/3" CCD	XGA(0.81 M pixel)(1034 x 779)	Max. 36 frames per sec.	
KP-F30Lite		White		VGA(0.33 M pixel)(659 x 494)	Max. 60 frames per sec.	
KP-FM30Lite		1CMOS	1/3" CMOS	VGA(0.36 M pixel)(752 x 480)	Max. 90 frames per sec.	21.5(W)×21.5(H)×21.5(D)mm KP-FBM30Lite is an integrated cable



Actual Size
KP-F200Lite, KP-F80Lite, KP-F30Lite



Actual Size
KP-FM30Lite, KP-FBM30Lite
*KP-FBM30Lite is an integrated PoCL cable



	KP-F200Lite	KP-F80Lite	KP-F30Lite	KP-FM30Lite KP-FBM30Lite
Imaging device	1/1.8-inch interline CCD (ICX274AL)	1/3-inch interline CCD (ICX204AL)	1/3-inch interline CCD (ICX424AL)	1/3-inch CMOS
Total pixels	1688 (H) x 1248 (V)	1077 (H) x 788 (V)	692 (H) x 504 (V)	—
Effective pixels	1628 (H) x 1236 (V)	1034 (H) x 779 (V)	659 (H) x 494 (V)	752 (H) x 480 (V)
Pixel size	4.4 μm (H) x 4.4 μm (V) (square lattice)	4.65 μm (H) x 4.65 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)	6.0 μm (H) x 6.0 μm (V) (square lattice)
Sensing area	7.16 mm (H) x 5.44 mm (V)	4.76 mm (H) x 3.57 mm (V)	4.88 mm (H) x 3.66 mm (V)	4.51 mm (H) x 2.88 mm (V)
Scanning system	Progressive			
Aspect ratio	4 : 3			5 : 3
Frame rate	15 frames per second (full pixel readout)	36 frames per second (full pixel readout)	60 frames per second (full pixel readout)	90 frames per second (full pixel readout)
Horizontal drive frequency	36.0000 MHz	36.0000 MHz	24.5454 MHz	36.818 MHz
Horizontal scanning frequency	18.75 kHz (full pixel readout)	28.346 kHz (full pixel readout)	31.468 kHz (full pixel readout)	45.29 kHz (full pixel readout)
Vertical scanning frequency	14.97 Hz (full pixel readout)	35.79 Hz (full pixel readout)	59.94 Hz (full pixel readout)	90 Hz
Sync system	Internal			
Lens mount	C-mount (Flange focal distance = 17.526 mm)			NF-mount (Flange focal distance = 12 mm)
Video output	Digital output (PoCL-Lite) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1628 (H) x 1236 (V) (full pixel readout)	Digital output (PoCL-Lite) Base configuration: 36.0000 MHz (Maximum cable length is 10 m) Output image size: 1024 (H) x 768 (V) (full pixel readout)	Digital output (PoCL-Lite) Base configuration: 24.5454 MHz (Maximum cable length is 10 m) Output image size: 659 (H) x 494 (V) (full pixel readout)	Digital output (PoCL-Lite) Base configuration: 36.8184 MHz (Maximum cable length is 10 m) (KP-FBM30Lite: Cable length is 2 m) Output image size: 752 (H) x 480 (V) (full pixel readout)
Resolution	Horizontal / Vertical: 1200 TV lines	Horizontal / Vertical: 800 TV lines	Horizontal: 500 TV lines / Vertical: 490 TV lines	Horizontal / Vertical: 480 TV lines
Sensitivity	400 lx, F5.6, 3200 K	400 lx, F4, 3200 K	400 lx, F5.6, 3200 K	400 lx, F2.8, 3200 K
Minimum illumination	1.0 lx (F1.4, MAX GAIN)			16 lx (F1.4, MAX GAIN)
Signal noise to ratio	50 dB			
Electric shutter	OFF 1/15, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF 1/36, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF 1/60, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)	OFF 1/90, 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/10000 second. OFF is normal exposure (frame rate) or changeable by variable shutter (Minimum 1/100000 second)
Gamma	γ = 1			
Frame on demand	(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode (C) VD reset mode			Fixed shutter (7 steps or variable)
Partial scan	Selectable start position and height of picture grabbing in 1H step.			—
Power supply voltage	12 ± 1 VDC			
Current consumption	Approx. 170 mA (Approx. 2.1 W)	Approx. 120 mA (Approx. 1.5 W)		Approx. 80 mA (Approx. 0.96 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	10 to 200 Hz 98 m/s ²			
Shock endurance	686 m/s ²			
External dimensions	29 (W) x 29 (H) x 29 (D) mm (Not including protrusions)			21.5 (W) x 21.5 (H) x 21.5 (D) mm (Not including protrusions) (Not including cable for KP-FBM30Lite)
Mass	Approx. 50 g			Approx. 20 g (Not including cable for KP-FBM30Lite)

HDTV Cameras

DK-H100	HDTV	2/3" IT-3CCD	1080•59.94/50i, 480/59.94i, 576/50i	1100 TV Line	99(W) × 105(H) × 155(D)mm
DK-Z50	HD-SDI/SD-SDI			800 TV Line	

High S/N with HD-SDI

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

14-bit ADC with the latest generation Hitachi DSP

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

High resolution (DK-H100)

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

High resolution (DK-Z50)

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

Small & light weight head

Versatile CCD shutter

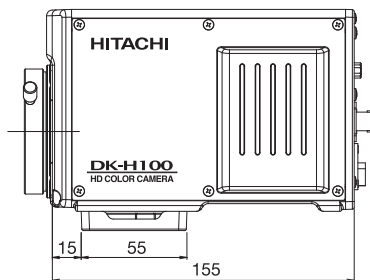
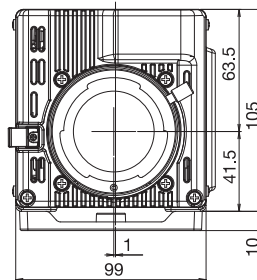
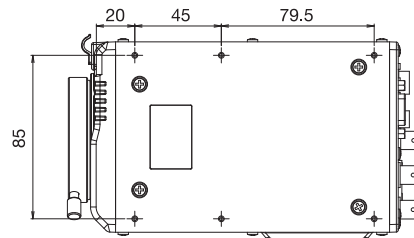
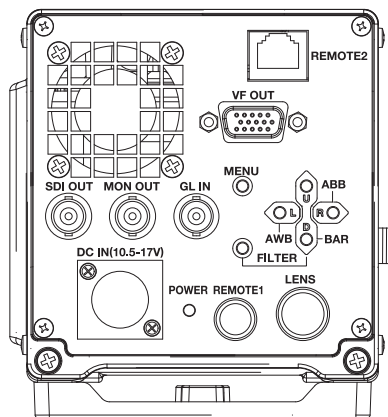
- Five preset shutter speeds
- Lock scan the camera video to image from asynchronous computer monitors, video walls or projectors without flicker
- Automatic electric shutter (AES) maintains the video level with a fixed lens f-stop

DSP provide advanced image handling and adjustment functions

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

Extensive user-friendly features

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



Unit: mm

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

HDTV Cameras

HV-HD33	HDTV HD-SDI/SD-SDI	1/3" 3MOS	1080•59.94i/50i (16:9), 720•59.94p/50p (16:9), 480•59.94i (16:9), 576•50i (16:9), 480•59.94i (4:3), 576•50i (4:3)	720 TV Line	65(W) × 65(H) × 125(D)mm
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■ New MOS sensors with improved sensitivity rise of 6 dB.

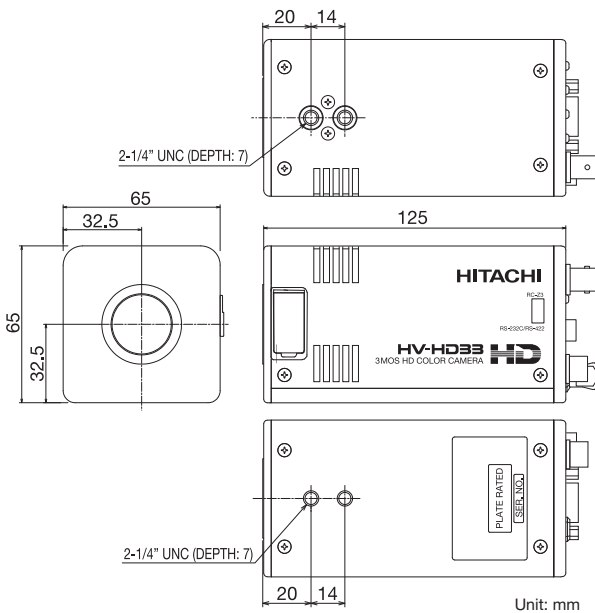
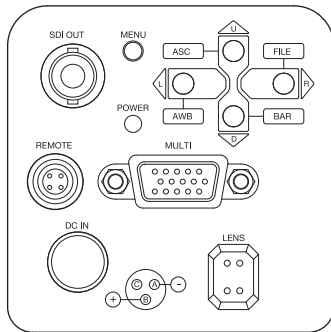
■ Multi format HDTV SDTV output

1080•59.94i/50i (16:9) 720•59.94p/50p (16:9)
480•59.94i (16:9) 576•50i (16:9)
480•59.94i (4:3) 576•50i (4:3)

■ Digital serial output
HD-SDI/SD-SDI 1 output

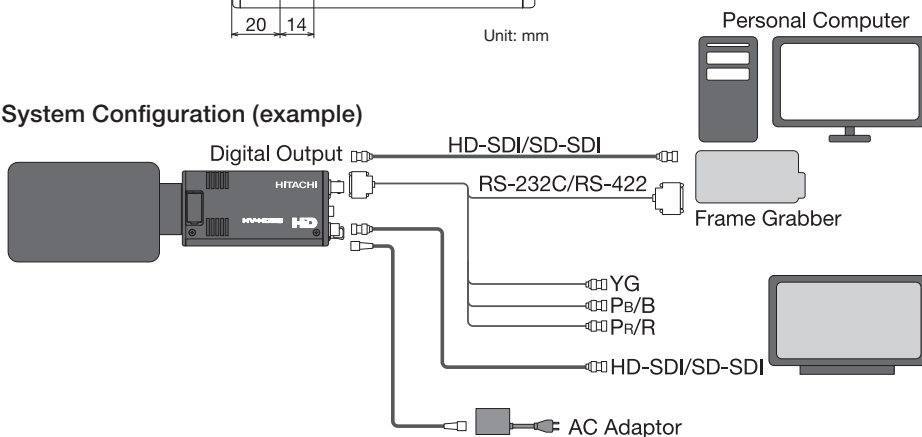
■ 6 color independent masking & Luminosity independent linear masking

■ Negative positive conversion & Right and left reversing



Output format	HDTV 1080•59.94i/50i (16:9), 720•59.94p/50p (16:9), SDTV 480•59.94i (16:9), 576•50i (16:9) 480•59.94i (4:3), 576•50i (4:3)
Imaging device	1/3" 3MOS
Total pixels	1376(H) x 1070(V)
Effective pixels	1280(H) x 720(V)
Actual image area	4.80 mm (H) x 3.84 mm (V)
Imaging system	R. G. B. 3MOS
Optical system	1/3" F2.2 prism
Lens mount	C-mount (flange back 17.526 mm in air)
Horizontal resolution	720 TV Line (HD-SDI output, Center of Screen, DTL: OFF, Ych)
Standard sensitivity	F8.0 (2000 lx, 3200K)
Minimum illumination	10 lx (F2.2, Gain: 15 dB, Gamma: ON)
S/N	53 dB (HD-SDI output Decode, Ych, 30 MHz)
Registration	All screen 0.05% (Without lens Characteristic)
Gain	0 dB to +15 dB 1 dB step
Shutter	Preset 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 Variable 1/60 to 1/11238 (59.94i/p mode, 1H (approx. 23 ms) step) 1/50 to 1/9375 (50i/p mode, 1H (approx. 28 ms) step)
Gamma	0.45 (ON) / 1.0 (OFF)
Scene file	4 Scene file
Color bar	ARIB bar
Power supply voltage	DC 12 V (10.5 V to 15 V)
Power consumption	approx. 8 W
Dimensions	65 mm (W) x 65 mm (H) x 125 mm (D)
Mass	550 g (except lens)
Ambient temperature	Operating -10 to 40°C (+14 to +104 °F) Storage -20 to 60°C (-4 to +140 °F)
Standard composition	• DC in plug: R03-P3F • Lens plug: E4-191J-100

System Configuration (example)



HDTV Cameras

KP-HD1005	HDTV HD-SDI	1/3" 1 CMOS	800 TV Line	64(W) × 63(H) × 135(D) mm	Power over coaxial DC type	1080 30P	
KP-HD1005-S2						1080 30P	
KP-HD1005-S4						1080 59.94i/50i/29.97p/25p	
KP-HD1005-S5				1080 59.94i/50i/29.97p/25p			
KP-HD1001				44(W) × 44(H) × 59(D) mm	Power over coaxial DC type	AC type	1080 30P
KP-HD20A						1080 59.94i/50i/29.97p/25p	
KP-HD20A-S2	1080 59.94P/50P						

KP-HD1001, KP-HD1005,
KP-HD1005-S2



KP-HD1005-S4, KP-HD1005-S5



KP-HD20A, KP-HD20A-S2



HD-SDI output

An HD-SDI output provides a non compressed full bandwidth high quality video signal with a low latency of 17ms or less.

Coaxial cable transmission

A standard 75 ohm coaxial cable of up to 100 meters is used for the HD-SDI output, allowing the use of existing coaxial cable.

Capable of transmitting up to 300 m by the Multiunit use (Except KP-HD1005-S4/-S5)

It is capable of transmitting up to 300m by HD-VLC transmission mode of the Multiunit use.

Multi-format support (KP-HD1005-S4/-S5, KP-HD20A)

1080-59.94i/50i/30p/25p

Wide dynamic range (KP-HD1001, HD1005/-S4/-S5)

Display clearly also large image of luminance difference.

Adaptive noise reduction (KP-HD1001, HD1005/-S4/-S5)

Bright HDTV color images can be obtained with just 0.3 lx —up to 64-time integration enables night time photographing. In addition, adaptive noise reduction makes it easy to shoot moving objects.

Can be output in four systems of video formats by using the Multiunit (except for the MU-HD104-S1).

Power over coaxial using the Multiunit (except KP-HD1001)
Possible because coaxial over power supply, wiring with a single coaxial cable is possible when using Multiunit.

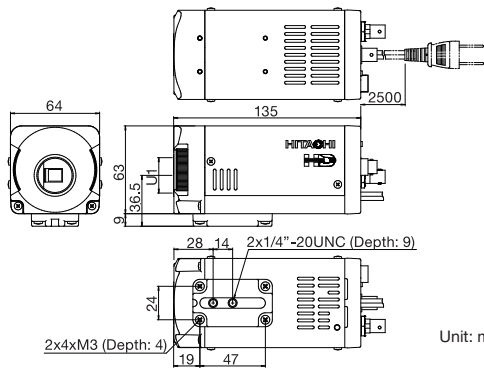
High Sensitivity

With a high sensitivity of 0.2 lx (0.4 lx for KP-HD20A-S2) Minimum Illumination, also enables monitoring of the installation environment that was difficult to look like a dark place of the production line. The black-and-white mode switching in KP-HD1005/-S4/-S5 and KP-HD1001, it is capable of high-sensitivity photography of 0.02 lx in black-and-white movie. In addition, it is possible to increase sensitivity of up to 30 times by using accumulation function in KP-HD1005/-S4/-S5 and KP-HD1001.

	KP-HD1001	KP-HD1005	KP-HD1005-S4 KP-HD1005-S5	KP-HD1005-S2	KP-HD20A KP-HD20A-S2
Imaging device	1/3-inch CMOS				
Total pixels	2010(H) x 1108(V) 2.2 M pixels				
Effective pixels	1944(H) x 1092(V)				
Sync system	Internal				
Video output	SMPTE 292M Compliance (HD-SDI Standard mode)				
	HD-VLC: Require the Multiunit for transmission		HD-VLC: Require the Multiunit for transmission		
	Analog output: VBS		Analog output: VBS		
Output Format	HD-SDI output: 1080 30p		HD-SDI output: 1080 59.94i/50i/29.97p/25p	HD-SDI output: 1080 30p	1080 59.94i/50i/29.97p/25p KP-HD20A-S2: 1080p 59.94/50
	VBS: NTSC, PAL		-	VBS: NTSC, PAL	VBS: NTSC, PAL
Transmission distance	HD-SDI Standard mode: Max. 100m (5C-FB 75Ω) HD-VLC mode: Max. 300m (5C-2V 75Ω/When using the optional Multi-unit)		HD-SDI Standard mode: Max. 100m (5C-FB 75Ω)	HD-SDI Standard mode: Max. 100m (5C-FB 75Ω) HD-VLC mode: Max. 300m (5C-2V 75Ω/When using the optional Multi-unit)	HD-SDI Standard mode: Max. 100m (5C-FB 75Ω) HD-VLC mode: Max. 300m (5C-2V 75Ω/When using the optional Multi-unit)
S/N	50 dB (AGC: OFF / Weight: ON)				
Horizontal resolution	800 TV lines				
Minimum illumination	Color: 0.2 lx 30 times accumulation: 0.007 lx B & W: 0.02 lx 30 times accumulation: 0.0007 lx (F1.2, AGC 48 dB, 3200K)			Color: 0.2 lx (F1.2, AGC 48 dB, 3200K)	Color: 0.2 lx (F1.2, AGC 48 dB, 3200K) (KP-HD20A-S2: 0.4 lx)
AGC	OFF/Auto (Max. 48 dB) / Manual (0 dB to +48 dB, 1 dB step)				
Accumulation Mode	Max. 30 times			-	
Electric shutter	OFF/Auto (AES) / Manual (1/30 to 1/14000 second)				OFF/Auto (AES)/ Manual (1/30 to 1/14000 second (KP-HD20A-S2: 1/60 to 100000 second)
Wide dynamic range	OFF/WDR WDR: Double shutter sampling			-	
Image quality adjustment	Level / Gamma / Color level / Black level / Detail				
Backlight correction	OFF/ ON (Photometry area can be set)				
Auto iris lens output	DC/VIDEO				
White balance	Auto: ATW / AWC / Manual (2500K to 10000K)				
Remote control	RS-232C			-	
RS-232C	-				
Lens mount	C-/CS- C-: C-mount Adaptor use				
Power supply	AC 100 V to		12 V DC ±10%, Power over coaxial from multi-unit		
Power Consumption	Approx. 11 W (AC 100 V)	Approx. 7.5 W (Power over coaxial)	Approx. 7.8 W (Power over coaxial)	Approx. 4 W (Power over coaxial)	Approx. 5.9 W (KP-HD20A-S2: Approx. 4.7 W (Power over coaxial)
Ambient Temperature	Operating	-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			
Shock endurance	Less than 29.6 m/S ² , 10 to 55 Hz XYZ axis for each 30 minutes)				
External dimensions	64 x 63 x 135 mm (excluding lens and protrusions)	64 x 63 x 103 mm (excluding lens and protrusions)	64 x 63 x 135 mm (excluding lens and protrusions)	64 x 63 x 135 mm (excluding lens and protrusions)	44 x 44 x 59 mm (excluding lens and protrusions)
Mass	Approx. 750 g (excluding lens)	Approx. 550 g (excluding lens)	Approx. 400 g (excluding lens)	Approx. 550 g (excluding lens)	Approx. 200 g (excluding lens)

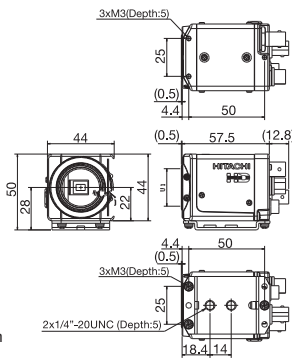
HDTV Cameras

KP-HD1001, KP-HD1005, KP-HD1005-S2

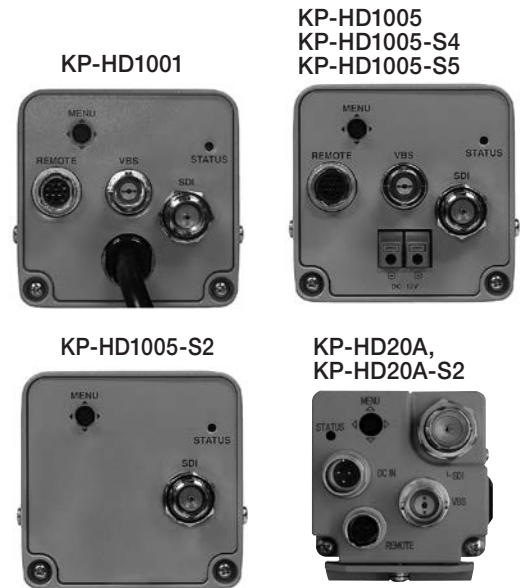


KP-HD1005 and KP-HD1005-S2 does not have AC code on the rear.
 KP-HD1005-S2 is different from the rear of the connector.

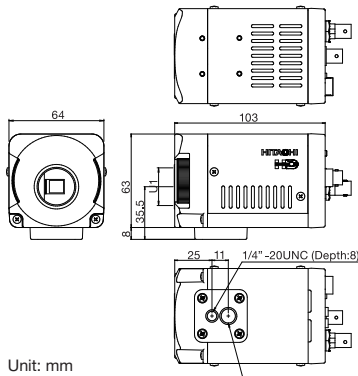
KP-HD20A, KP-HD20A-S2



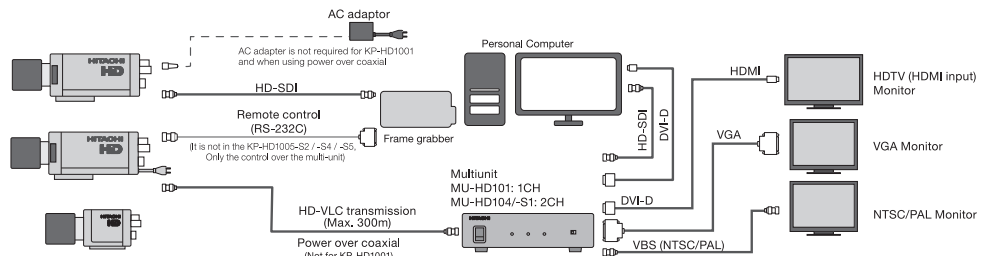
Rear View



KP-HD1005-S4, KP-HD1005-S5



System Configuration (example)



Multiunit

MU-HD101	1CH input	HD-SDI input HD-VLC / HD-SDI transmission	Output: HD-SDI, analog, DVI-D, VGA	160(W) × 42(H) × 170(D)mm
MU-HD104	4CH input	HD-SDI input, HD-VLC transmission	HD-SDI output	420(W) × 44(H) × 257(D)mm
MU-HD104-S1				

MU-HD101



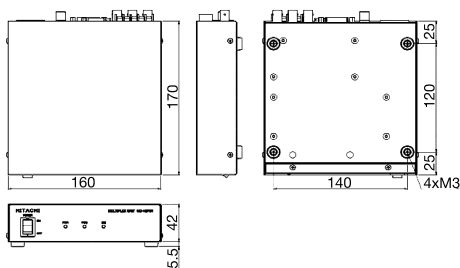
MU-HD104



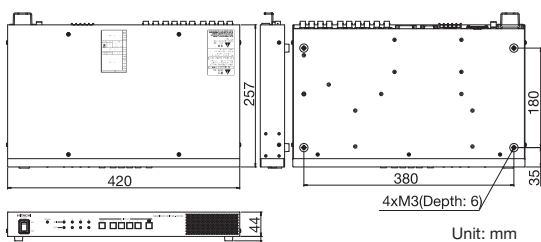
MU-HD104-S1



MU-HD101



MU-HD104 / MU-HD104-S1



*Front panel display, switch / button / LED, and the rear connector is different in MU-HD104-S1.

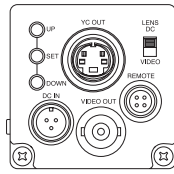
	MU-HD101	MU-HD104	MU-HD104-S1
Video input	HD-SDI 1: BNC HD-SDI (SMPT292M) HD-VLC	HD-SDI 4: BNC	HD-VLC
Video output	HD-SDI output 1: BNC (75Ω) Through 1(MU-HD101), 4(MU-HD104): BNC(75Ω) Analog output 1: BNC (75Ω) DVI-D 1: DVI-D (SINGLE LINK) VGA 1: D-SUB 15pin Full HD: 1920x1080: 59.94i/50i/29.97p/25p SXGA: 1280x1024: 60p XGA: 1024x768: 60p NTSC: 720x486: 59.94i PAL: 768x576: 50i		HD-SDI output 1: BNC (75Ω) Through 4: BNC (75Ω) Full HD: 1920x1080: 29.97p
Power supply system	Power over Coaxial		
Max. transmission distance (Using KP-HD1001)	HD-SDI: 100 m (5C-FB), 60 m (3C-FB) HD-VLC: 300 m (5C-2V), 170 m (3C-2V)		
Remote control	RS-232C		-
Power supply	AC100 V to 230 V ±10% 13 W (Power over coaxial on) 5 W (Power over coaxial off)		
Operating temperature	-10 to +45°C (+14 to +113 °F)		
External dimensions	160(W) × 42(H) × 170(D) mm	420(W) × 44(H) × 257(D)mm	
Mass	Approx. 700 g	Approx. 3.6 kg	

Analog Interface Cameras

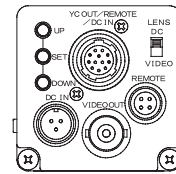
KP-D20A	NTSC/PAL	1CCD Color	1/3" CCD	NTSC: 480 TV line PAL: 470 TV line	44(W) × 44(H) × 49(D)mm	12pin type
KP-D20B	NTSC/PAL		1/2" CCD			
KP-D20B-S3	PAL					



KP-D20A, KP-D20B



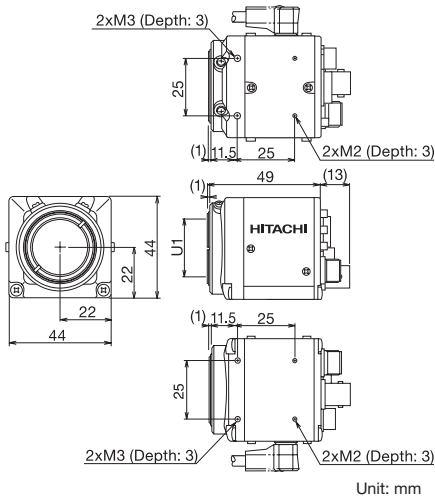
KP-D20B-S3



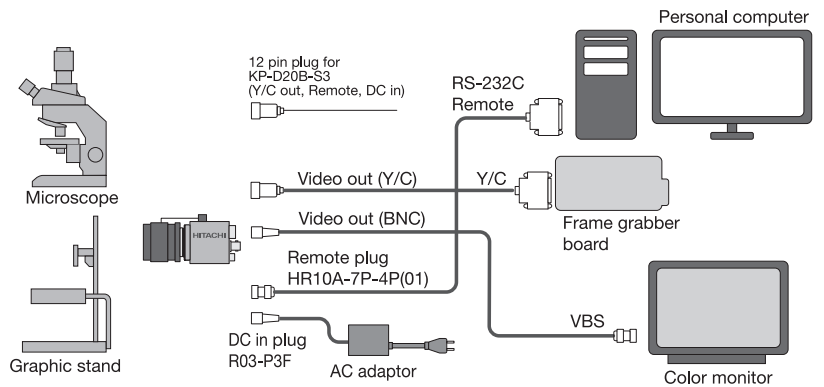
Compact multi purpose CCD color camera

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

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



System Configuration (example)



		KP-D20A	KP-D20B
Imaging device		1/3-inch interline CCD (NTSC: ICX408AK, PAL: ICX409AK)	1/2-inch interline CCD (NTSC: ICX418AKL, PAL: ICX419AKL)
	Total pixels	NTSC: 811 (H) × 508 (V), PAL: 795 (H) × 596 (V)	
	Effective pixels	NTSC: 768 (H) × 494 (V), PAL: 752 (H) × 582 (V)	
	Pixel size	NTSC: 6.35 μm (H) × 7.4 μm (V), PAL: 6.5 μm (H) × 6.25 μm (V)	NTSC: 8.4 μm (H) × 9.8 μm (V), PAL: 8.6 μm (H) × 8.3 μm (V)
	Color filter	RGB primary color mosaic filter	
Sensing area		NTSC: 4.88 mm (H) × 3.66 mm (V), PAL: 4.89 mm (H) × 3.64 mm (V)	NTSC: 6.45 mm (H) × 4.84 mm (V), PAL: 6.47 mm (H) × 4.83 mm (V)
Scanning frequency		NTSC; Horizontal: 15.734 kHz, Vertical: 59.94 Hz 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: 480 TV Line, PAL: 470 TV 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. 220 mA	
Ambient	Operation	-10 to 50°C (+14 to +122°F), 30 to 80 % RH	
	Storage	-20 to 60°C (-4 to +140°F), 20 to 90 % RH	
Vibration endurance		10 to 55 Hz 1.96 to 59.3 m/s ²	
External dimensions		44 (W) × 44 (H) × 49 (D) mm (Not including protrusions) KP-D20B-S6: 58 (W) × 44 (H) × 49 (D) mm	
Mass		Approx. 130 g KP-D20B-S6: 170 g	

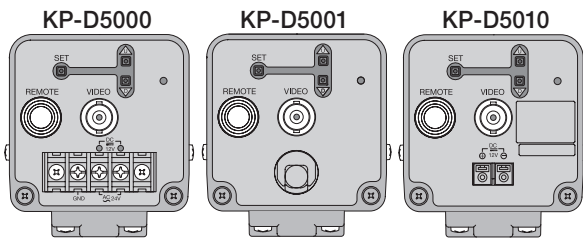
Analog Interface Cameras

KP-D5000	NTSC	1CCD Color (High sensitivity)	1/2" CCD	560 TV line	64(W) × 63(H) × 135(D)mm	AC24V/DC12V
KP-D5001						AC100V
KP-D5010					64(W) × 63(H) × 64(D)mm	DC12V

KP-D5000 / KP-D5001



KP-D5010



High Sensitivity

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

High Resolution

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

High Sensitivity and low S/N ratio

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

Adaptive Image Enhancer

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

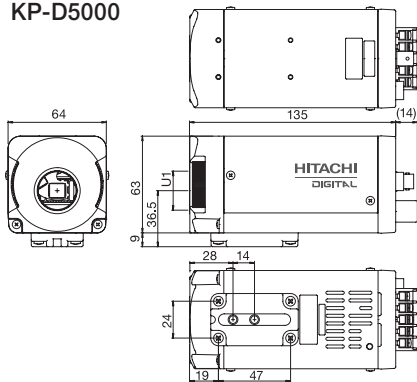
Adaptive Fog Reduction

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

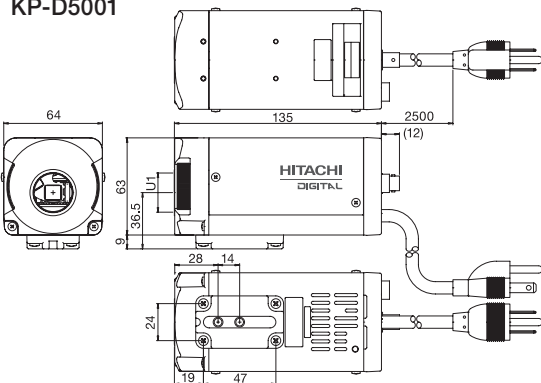
Dial type back focus adjustment

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

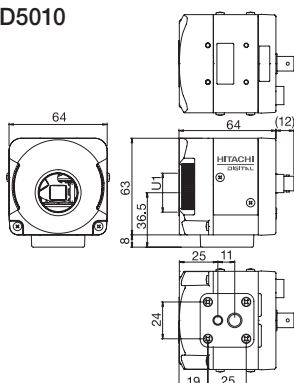
KP-D5000



KP-D5001



KP-D5010



Unit: mm

		KP-D5000	KP-D5001	KP-D5010
Color system		NTSC or PAL		
Imaging device		1/2-inch interline CCD (NTSC: ICX428AKL, PAL: ICX429AKL)		
	Total pixels	NTSC: 811(H) × 508(V) PAL: 795(H) × 596(V)		
	Effective pixels	NTSC: 768(H) × 494(V) PAL: 752(H) × 582(V)		
	Sensing area	NTSC: 6.45(H) × 4.84(V) mm PAL: 6.47(H) × 4.83(V) mm		
	Pixel size	NTSC: 8.4 μm (H) × 9.8 μm (V) PAL: 8.6 μm (H) × 8.3 μm (V)		
Scanning system		2:1 interlace		
Scanning frequency		NTSC Horizontal: 15.734 kHz, Vertical: 59.94 Hz PAL Horizontal: 15.625 kHz, Vertical: 50 Hz		
Sync system		Internal/external (HD/VD)		
Video output	VBS	1.0 Vp-p		
	Video	0.7 Vp-p positive		
	Sync	0.3 Vp-p negative		
	Burst	0.3 Vp-p, more than 8 cycles		
	Impedance	75 Ω unbalanced		
S/N		More than 53 dB (AGC: OFF(-6 dB), enhancer and gamma off, DNR high)		
Resolution		Horizontal: 560 TV lines (color), 580 TV Lines (B/W) Vertical: 350 TV Lines (High resolution mode)		
Sense illumination range		0.0002 to 100,000 lx (F1.2, auto-iris lens)		
Minimum illumination		Color: 0.03 lx (F1.2, 3200K, AGC maximum) B/W: 0.004 lx (F1.2, 3200K, AGC maximum, tungsten lamp)		
AGC		On off selectable Off (manual: 0 to 51 dB), On (max. gain: -6 to 51 dB)		
Electric shutter		(NTSC: 1/60, PAL: 1/50), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000, 1/50,000, 1/100,000 second and auto		
Integration multiple setting		Automatic or manual (fixed) Automatic: max. 128 times Manual: max. 512 times		
Back light control		On/Off switchable Sensing areas: selectable 9 areas Adaptive image enhancer: Off (mode off), On (automatic back light control)		
Auto-iris lens output		Switchable video signal input type or iris control voltage input (galvanometer) type		
White balance		Selectable auto-tracking (ATW), preset (AWC), manual (R/B gain adjustment)		
Text display		One line of up to 24 alphanumeric characters		
Digital zoom		Up to 4 times (resolution loss with magnifications)		
B/W Mode		OFF: color always mode ON: B/W always mode AUTO: mode selected in response to brightness (can be set for high, medium or low)		
Noise reduction		Selectable On/Off/High/Low High: adaptive noise reduction (S/N ratio priority mode), Low: adaptive noise reduction (motion resolution priority mode)		
Adaptive fog reduction		Off: fog reduction mode off On: adjust foggy picture automatically Manual: adjust foggy picture manually		
Scene file		It is possible to memorize five cameras setting (changeable by remote control)		
Power supply voltage		AC24V ±10%, 50/60Hz DC12V ±10%	AC100 to 230 V ±10%, 50/60Hz	DC12V ±10%
Power consumption		4.0 W or less		2.3 W or less
Lens mount		C-/CS-mount (with dial type back focus adjustment)		
Ambient temperature	Operating	-10 to +50 °C (+14 to +122 °F) / 30 to 80% RH		
	Storage	-20 to +60 °C (-4 to +140 °F) / 20 to 90% RH		
Vibration endurance		10 to 55 Hz 1.96 to 59.3 m/s ²		
Dimensions		64(W) × 63(H) × 135(D) mm (not including lens and protrusions)		64(W) × 63(H) × 64(D) mm (not including lens and protrusions)
Mass		Approx. 600 g		Approx. 270 g

Accessory List

		Camera Link (MiniCL)																	Camera Link																							
Interface		WCL Type							PCL Type							SCL Type			PoCL-Lite																							
Model Name		KP-F520WCL	KP-FD510WCL	KP-F500WCL	KP-FR500WCL	KP-F145WCL	KP-FM500WCL	KP-FM400WCL / FM200WCL	KP-FMR400WCL / FMR200WCL	KP-F32WCL	KP-FD32WCL	KP-FD500PCL / FD202PCL	KP-FD140PCL	KP-F230PCL / F31PCL	KP-FR230PCL / FR31PCL	KP-FR200PCL / F80PCL / KP-F30PCL	KP-FR200PCL / FR80PCL / FR30PCL	KP-FB30PCL / FBR30PCL	KP-FM200PCL / FM100PCL	KP-FMD200PCL / FMD100PCL	HV-F202SCL / F130SCL / F32SCL	KP-FM1200CL	KP-FD500SCL / FD202SCL	KP-FD140SCL	KP-F230SCL / F31SCL	KP-FR230SCL / FR31SCL	KP-F200SCL / FR80SCL / F30SCL	KP-FR200SCL / FR80SCL / FR30SCL	KP-FBR30SCL	KP-FMR830CL	KP-F200Lite / F80Lite / F30Lite	KP-FM30Lite	KP-FBM30Lite									
Junction Box	JU-M1A																																									
	JU-F1																																									
	JU-Z2																																									
Tripod Adaptor	TA-UBGV	○								○	○																															
	TA-F500		○	○	○	○						○	○												○	○																
	TA-F230													○	○											○	○															
	TA-F202																							○																		
	TA-F200S															○	○											○	○													
	TA-FM100PCL																								○	○																
	TA-FM200							○	○	○																																
	TA-FM30Lite																																		○		○	○				
TA-FB30/FB30P																																					○					
Mini Camera Link Cable SDR-MDR	(1m)	C-101SCL	○	○	○	○	○	○	○(*2)															○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○					
	(2m)	C-201SCL	○	○	○	○	○	○	○(*2)																○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○				
	(3m)	C-301SCL	○	○	○	○	○	○	○(*2)																○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○				
	(5m)	C-501SCL	○	○	○	○	○	○	○(*2)																○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○			
	(10m)	C-102SCL							○																																	
(for High Frequency)	(10m)	C-102SCL (HF)	○	○	○	○		○																○	○	○	○	○	○	○	○	○	○	○	○	○	○					
PoCL Cable SDR-SDR	(1m)	C-101PCL (SS)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
	(2m)	C-201PCL (SS)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
	(3m)	C-301PCL (SS)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
	(5m)	C-501PCL (SS)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
(10m)	C-102PCL (SS)							○																○	○	○	○	○	○	○	○	○	○	○	○	○	○					
PoCL Cable SDR-MDR	(1m)	C-101PCL (SM)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
	(2m)	C-201PCL (SM)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
	(3m)	C-301PCL (SM)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
	(5m)	C-501PCL (SM)	○	○	○	○	○	○	○(*2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
(10m)	C-102PCL (SM)							○																○	○	○	○	○	○	○	○	○	○	○	○	○	○	○				
Camera Cable	(2m)	C-201KSM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
	(5m)	C-501KSM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
	(10m)	C-102KSM	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
12 Pin Plug	HR10A-10P-12S	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			
Dummy Glass	ARC1214	●	○	●	○	●						●	○	○	●	○									●	○	○	●	○	●	○					●	○	○	○	○		
	ARC1616						●	○	○																																	
IR Cut Filter	IRC650	○	●	○	●	○				○	●	○	●	○	○	○	●								○	●	○	○	●	○	●					○	○	○	○	○	○	
	IRC1616						○	○	●																																	

● Standard equipment

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

(*2) : When using KP-FM500WCL/FMR400WCL/FM400WCL/FMR200WCL/FM200WCL/FM1200CL in Full Configuration mode, please use the dedicated cable for Full Configuration.

Accessory List

Interface		USB3 Vision				GigE Vision						Analog		HD					
Model Name		KP-FM500UB	KP-FMD500UB	KP-FM200UB / F32UB	KP-FDM200UB / FD32UB	KP-FM500GV	KP-FMD500GV	KP-FM200GV / F32GV	KP-FMD200GV / FD32GV	HV-F202GV / 130GV / F32GV	KP-F500GV / F202GV / F145GV / F140GV KP-F83GV / F33GV	KP-FD500GV / FD202GV / KP-FD140GV KP-FD83GV / FD33GV	KP-D20A / D20B	KP-D20B-S3	DK-H100 / Z50	HV-HD33	KP-HD1005	KP-HD1001	KP-HD20A
Junction Box	JU-M1A																		
	JU-Z2																		
Multiunit	MU-HD101																		
	MU-HD104																		
Remote Control Box	RC-Z3																		
Camera control panel	RU-1000VR																		
	RU-1500JY																		
C/CS-mount Adaptor	LA-D20AB																		
Tripod Adaptor	TA-UBGV																		
	TA-FM200																		
	TA-D20AB																		
	TA-F202																		
	TA-M1																		
Camera Cable	(2m) C-201KSM																		
	(5m) C-501KSM																		
	(10m) C-102KSM																		
15 pin Plug	KEC-15P																		
12 Pin Plug	HR10A-10P-12S																		
6 pin Plug	HR10A-7P-6S(74)																		
4 pin Plug	HR10A-7P-4P																		
Lens Plug	E4-191J-100																		
Lens extension cable	ECE-R22 (0.22m) (FUJINON)																		
DC Plug	R03-P3F																		
Dummy Glass	ARC1214																		
IR Cut Filter	IRC650																		

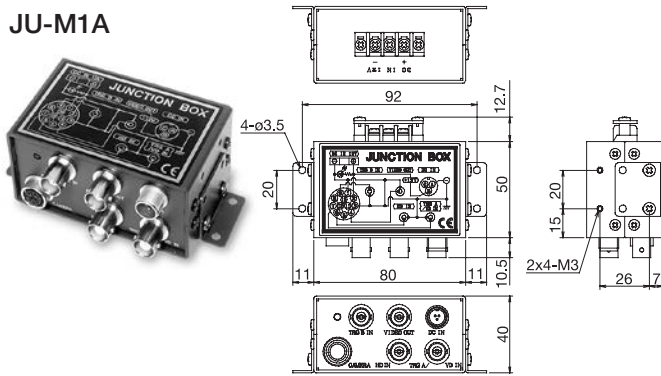
● Standard equipment

Accessories

Junction Box

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

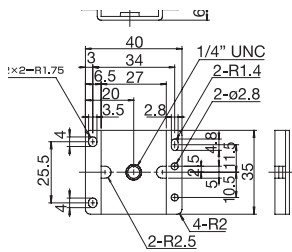
JU-M1A



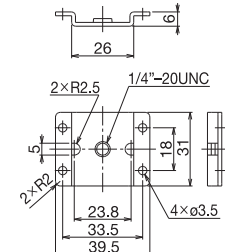
Tripod Adaptor

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

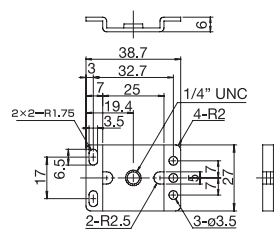
TA-F500



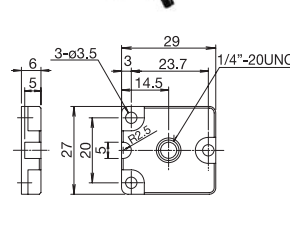
TA-FM200



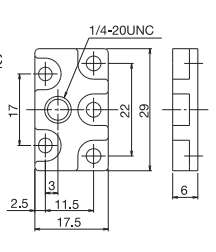
TA-F230



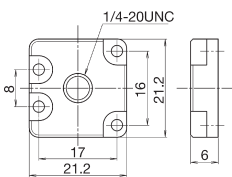
TA-F200S



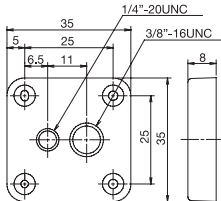
TA-FM100PCL



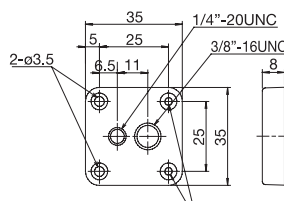
TA-FM30Lite



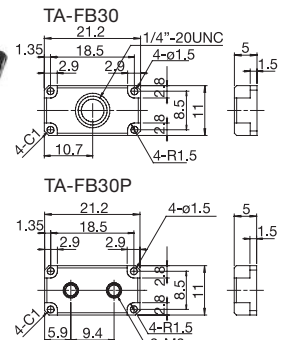
TA-M1



TA-D20AB



TA-FB30 / FB30P



Camera Cable

C-201/501/102KSM



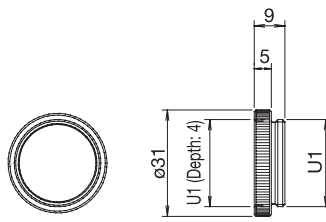
The camera cable is used for connecting camera and junction box. Supply 12VDC or external trigger signal to camera.

Molded type

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

C/CS Adaptor

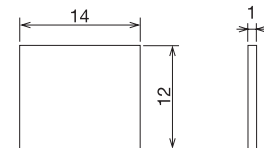
LA-D20AB



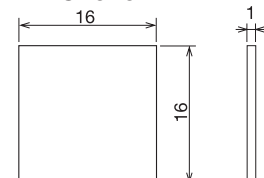
C- to CS-mount adapter. 5 mm adapter ring used when C-mount lenses are used on a CS-mount camera.

Dummy Glass

ARC1214



ARC1616



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

List of Frame Grabber Board

Interface		Mini Camera Link											PoCL-Lite		Analog													
Output		PCL (PoCL)											B/W		Color													
Board Maker	Model	Interface	KP-FD500PCL	KP-FMD200PCL	KP-FMD100PCL	KP-FD202PCL	KP-FD140PCL	KP-FR230PCL	KP-FR31PCL	KP-FR200PCL	KP-FR80PCL	KP-FR30PCL	KP-FBR30PCL	KP-FM200PCL	KP-FM100PCL	KP-F230PCL	KP-F31PCL	KP-F200PCL	KP-F80PCL	KP-F30PCL	KP-F200Lite	KP-F80Lite	KP-F30Lite	KP-FM30Lite	KP-FBM30Lite	KP-D20A/B		
Cognex (USA)	MVS-8602e	PoCL														○												
	MVS-8600	CL																										
Epix (USA)	PIXCI SV5	Analog																									○	
	PIXCI-CL1	CL																										
	PIXCI-CL2	CL																										
	PIXCI-EL1	CL																										
	PIXCI-EL1DB	CL																										
	PIXCI-EB1	CL																										
	PIXCI-EB1(PoCL)	CL																										
	PIXCI-E4	CL					○			○	○	○	○	○				○	○	○	○							
	PIXCI-E4DB	CL																										
	PIXCI-ECB1	CL																										
PIXCI-EC1	CL																											
Euresys (BELGIUM)	GrabLink	CL																										
	mvGAMMA-CL	CL(Base)																										
MATRIX VISION (GERMANY)	mvTITAN-CL	CL(Base/Mid)																										
	mvTITAN-RGB/G4	Analog (RGB)																									○	
	mvHYPERION-CL	CL																										
	mvHYPERION-CL m/f	CL																										
	mvDELTA	Analog																									○	
	mvSIGMA	Analog																									○	
Matrox (CANADA)	Helios-XCL	CL																										
	Helios-eCL/XCL	CL(64MZ)																										
	Solios XCL (6MCL/FC)	CL(66/85MHz)Base, Mid																										
	Solios eVCL	CL(85MHz) Base	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	Solios eVCL (F)	CL(85MHz) Base, Full	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
	METEOR II -MC	Analog																									○	
	METEOR II -Digital	LVDS																										
National Instruments (USA)	METEOR II -CL	CL									○							○										
	PCI/PXI-1428	CL																										
	PCI-1426	CL																										
	PCIe-1427	CL																										
	PCIe-1430	CL																										
AVALDATA (JAPAN)	APX-336	Analog																										
	APX-3310CL	CL(Base)																										
	APX-3316	CL(Full)																										
	APX-3312A	CL(Base)									○	○	○	○			○	○	○	○								
	APX-3313A	CL(Full)																										
	APX-3318	CL(Full)																										
	Non-current products (production discontinued)	APX-3311	PoCL-Lite																			○	○	○				
		APX-3302	CL(Base)	○			○	○	○	○	○		○					○	○	○	○							
		APX-3323	CL(Full)	○			○	○	○	○	○		○					○	○	○	○							
		APX-3324A	CL(Base)	○			○	○	○	○	○		○					○	○	○	○							
APX-3326A		CL(Full)	○			○	○	○	○	○		○					○	○	○	○								
TIETECH GRAPHIN COMPANY(JAPAN)	IPM-8580CL-M	CL(Medium)																										
	IPM-8580CL-F	CL(Full)																										
	IPM-8580CL-M(PoCL)	CL(Medium)	○			○	○	○	○	○		○					○	○	○	○								
	IPM-8531CL-BE	CL(Base)																										
	IPM-8531CL-BE(PoCL)	CL(Base)	○			○	○	○	○	○		○					○	○	○	○								
	IPM-5542-F	CL(Full)																										
	IPM-5542-M	CL(Medium)																										
	IPM-5542-M(PoCL)	CL(Medium)	○			○	○	○	○	○		○					○	○	○	○								
	IPM-5512	CL(Base)																										
IPM-5512-PCL(PoCL)	CL(Base)	○			○	○	○	○	○		○					○	○	○	○									
MICRO-TECHNICA (JAPAN)	IPM-5512-Lite	PoCL-Lite																			○	○	○					
	MTPCI-TL2	CL(Base)					○	○																				
	MTPCI-PL-G	CL(Base)																			○	○	○	○				
Linx (JAPAN)	MTPEX-QL-G	PoCL-Lite					○	○	○	○							○	○	○	○		○	○	○				
	GINGA digital-CL2	CL(Base/Mid)																										
Renesas Semiconductor Package & Test Solutions Co., Ltd. (JAPAN)	GINGA digital-CLe	CL(Base/Mid)																										
	NVP-Ax230CL	PoCL/CL 2CH	*	*	*	*	*	○	○	○	○	○	○	○	○	*	○	○	○	○	○	○	○	○	○	○	○	
	NVP-Ax235CL	PoCL/CL 4CH	*	*	*	*	*	○	○	○	○	○	○	○	*	○	○	○	○	○	○	○	○	○	○	○	○	
	SVP-AX330CL	PoCL/CL 1CH																										
EDEC LINSEY SYSTEM (JAPAN)	NVP-Ax130CL	PoCL/PoCL-Lite/CL(Base)									○	*	○	*	*		○	*	○	*		○	○					
	MUCap-HD2e	CL																										
	EDCap-CLeH	CL	○			○	○			○									○									

List of Frame Grabber Board (Box type)

Interface			Mini Camera Link																																
			SCL (Non-PoCL)									WCL (Auto Selection of PoCL or non-PoCL)																							
Output			3CCD	Color			RAW			B/W			Color	RAW	B/W																				
Board Maker	Model	Interface	HV-F202SCL	HV-F130SCL	HV-F32SCL	KP-FD500SCL	KP-FD202SCL	KP-FD140SCL	KP-FMR830CL	KP-FR230SCL	KP-FR31SCL	KP-FR200SCL	KP-FR80SCL	KP-FR30SCL	KP-FBR30SCL	KP-FM1200CL	KP-F230SCL	KP-F31SCL	KP-F200SCL	KP-F80SCL	KP-F30SCL	KP-FD510WCL	KP-FD32WCL	KP-FR500WCL	KP-FMR400WCL	KP-FMR200WCL	KP-F520WCL	KP-F500WCL	KP-F145WCL	KP-F32WCL	KP-FM500WCL	KP-FM400WCL	KP-FM200WCL		
FAST (JAPAN)	FVC06	CL														○	○	○	○									○	○						
	FVC07CLBe	CL	○										○				○	○	○	○								○	○			*	*		
	FVC07CLMF	CL															○	○	○	○												*	*		
	FHC3312	CL															○	○	○									○	○						
DECSYS (JAPAN)	DS-3510	CL(Base) (1TAP) (Non-PoCL)				○						○	○	○				○	○	○															
	DM-3010	CL(Base)(1TAP/2TAP) (Non-PoCL)				○			○	○	○	○	○	○			○	○	○	○									○	○					
	DM-3011	CL(Base/Medium) (1TAP/2TAP/4TAP) (Non-PoCL)				○	○		○	○	○	○	○	○			○	○	○	○			○	○	○	○			○	○				○	○
	DS-4610	CL(Base)(1TAP/2TAP) (Non-PoCL)				○			○	○	○	○	○	○			○	○	○	○									○	○					
	DM-3210	CL(Base/Medium) (1TAP/2TAP/4TAP) (Non-PoCL)				○	○		○	○	○	○	○	○			○	○	○	○				○	○	○	○		○	○				○	○
Yaskawa Electric Corporation (JAPAN)	MYVIS YV260	CL																																	

Interface			Mini Camera Link													PoCL-Lite		Analog									
			SCL (Non-PoCL)													B/W	Color										
Output			Color			RAW			B/W								Color										
Board Maker	Model	Interface	KP-FD500PCL	KP-FD202PCL	KP-FD140PCL	KP-FMD200PCL	KP-FMD100PCL	KPFR230PCL	KP-FR31PCL	KP-FR200PCL	KP-FR80PCL	KP-FR30PCL	KP-FBR30PCL	KP-FM200PCL	KP-FM100PCL	KP-F230PCL	KP-F31PCL	KP-F200PCL	KP-F80PCL	KP-F30PCL	KP-F200Lite	KP-F80Lite	KP-F30Lite	KP-FM30Lite	KP-FBM30Lite	KP-D20A/B	
FAST (JAPAN)	FVC06	CL																	○								
	FVC07CLBe	CL		○												○	○	○	○								
	FVC07CLMF	CL														○	○	○	○								
	FHC3312	CL	○	○													○	○									
DECSYS (JAPAN)	DS-3510	CL(Base) (1TAP) (Non-PoCL)																									
	DM-3010	CL(Base)(1TAP/2TAP) (Non-PoCL)			○			○	○	○	○	○	○			○	○	○	○	○							
	DM-3011	CL(Base/Medium) (1TAP/2TAP/4TAP) (Non-PoCL)			○	○		○	○	○	○	○	○			○	○	○	○	○							
	DS-4610	CL(Base)(1TAP/2TAP) (Non-PoCL)			○			○	○	○	○	○	○			○	○	○	○	○							
	DM-3210	CL(Base/Medium) (1TAP/2TAP/4TAP) (Non-PoCL)			○	○		○	○	○	○	○	○			○	○	○	○	○							
Yaskawa Electric Corporation (JAPAN)	MYVIS YV260	CL		○	○											○	○	○	○	○							

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

List of Optional Lens

μ•TRON

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



HF series

Technical Information

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

FUJINON

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



HF35SA-1



TF2.8DA-8

Technical Information

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

TAMRON

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



23FM16SP



23FM25SP



23FM50SP

Technical Information

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

Tokina

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



KCM-0914MP5



KCM-10D-64



KCM-50NII

Technical Information

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

List of Optional Lens

SPACECOM

	Supports HDTV	Supports Megapixels Zoom Day & Night
Model	TAV2812DCIR-MP	VZ2465RI R-MP
Image Format	1/3 type	1 type
Focal Length	2.8-12mm	24-65mm
Dimensions	CS	C
Mount	ø41.3mm	80 X 80mm
Note	HERCULES	Available DC Auto Iris type MERCURY



TAV2812DCIR-MP



VZ2465RI R-MP

Technical Information

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

CBC

	Supports Megapixels Manual Iris		Macro Zoom
Model	M0814-MP2	M1214-MP2	MLH-3XMP
Image Format	2/3 type	2/3 type	2/3 type
Focal Length	8mm	12mm	8.7 to 29.4mm
Dimensions	ø33.5mm	ø33.5mm	ø36.5mm
Mount	C	C	C



M0814-MP



M1214-MP



MLM-3XMP

Technical Information

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

SCHOTT MORITEX

	1" type, Supports 5 megapixels	
Model	ML-U0618MP9	ML-U0814MP9
Focal Length	6mm	8mm
Fno	1.8	1.4
Resolution	Center: 150 lp/mm Periphery: 100 lp/mm	
distance of closest approach	0.1	0.1
Image Format	16.8mm (1-inch support)	



	1" type, Supports 5 megapixels					
Model	ML-U1214MP9	ML-U1614MP9	ML-U2514MP9	ML-U3514MP9	ML-U5016MP9	ML-U7518MP9
Focal Length	12.5mm	16mm	25mm	35mm	50mm	75mm
Fno	1.4	1.4	1.4	1.4	1.6	1.8
Resolution	Center: 150 lp/mm Periphery: 125 lp/mm					
distance of closest approach	0.1	0.1	0.1	0.15	0.3	0.8
Image Format	16.8mm (1-inch support)					

Technical Information

- SCHOTT MORITEX Corporation URL : <http://www.schott-moritex.com>
North America: SCHOTT North America., Inc. TEL : +1 (408)363-2100 FAX : +1 (408)363-9980
Outside North America (Japan) TEL : +81-48-218-2525 FAX : +81-48-462-6710

MIKAMI

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



Technical Information

- MIKAMI & CO., LTD. URL : www.kk-mikami.co.jp TEL : +81-3-3230-4511 FAX : +81-3-3230-3451

Hitachi Industrial Digital Interface Camera Line-up

		Image Size								
		VGA	XGA	Quad-VGA	SXGA	UXGA	2M pixels	4M pixels	5M pixels	12M pixels
Flame late	280 fps						● KP-FMR200WCL ● KP-FM200WCL			
	200 fps	■ HV-F32SCL ● KP-FD32GV ● KP-FD32UB ● KP-FD32WCL ● KP-F32GV ● KP-F32UB ● KP-F32WCL			GV : GigE Vision UB : USB3 Vision WCL : Mini Camera Link (PoCL/non-PoCL auto switching) PCL : Mini Camera Link (PoCL) SCL : Mini Camera Link (non-PoCL) Lite : PoCL-Lite KP-FM1200CL is Mini Camera Link (non-PoCL)					
	163 fps								● KP-FM500WCL	
	150 fps				■ : 3CCD Color (RGB) ■ : 3CCD Colo (YUV) ● : Color (RGB) ● : Color (YUV) ● : Color (RAW) ● : Black and White			● KP-FMR400WCL ● KP-FM400WCL		
	120 fps	● KP-FR31PCL/SCL ● KP-F31PCL/SCL								
	112 fps	■ HV-F32GV								
	90 fps	● KP-FD33GV ● KP-F33GV ● KP-FM30Lite ● KP-FBM30Lite								
	61 fps				● KP-FM100PCL					
	60 fps	● KP-FR30PCL/SCL ● KP-FBR30PCL/SCL ● KP-F30PCL/SCL ● KP-FB30PCL/SCL ● KP-F30Lite							● KP-FMD500UB ● KP-FM500UB	
	53 fps						● KP-FMD200UB ● KP-FM200GV ● KP-FM200UB ● KP-FM200PCL			● KP-FM1200CL
	36 fps		● KP-FD83GV ● KP-FR80PCL/SCL ● KP-F83GV ● KP-F80PCL/SCL ● KP-F80Lite							
	30 fps			■ HV-F130GV ■ HV-F130SCL	● KP-FD140GV ● KP-FD140PCL/SCL ● KP-FMD100PCL ● KP-F145GV ● KP-F140GV ● KP-F145WCL	■ HV-F202SCL ● KP-FMD200GV ● KP-FD202GV ● KP-FD202PCL/SCL ● KP-FMD200PCL ● KP-FR230PCL/SCL ● KP-F202GV ● KP-F230PCL/SCL				
	28 fps						■ HV-F202GV			
	22 fps								● KP-FM500GV	
	20 fps						● KP-FMD200PCL			
	18 fps								● KP-F520WCL	
	16 fps								● KP-FR500WCL ● KP-F500WCL ● KP-F500GV	
	15 fps						● KP-FR200PCL/SCL ● KP-F200PCL/SCL ● KP-F200Lite			
12 fps								● KP-FD500PCL/SCL		
9 fps								● KP-FMD500GV ● KP-FD500GV		

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

These Specifications are subject to change without notice.

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