

General Catalog

# Cameras for Industrial Applications

Camera Photo is Actual Size (approx.)



Such as KP-FM30Lite



Such as KP-FMD200UB



Such as KP-FD510UB



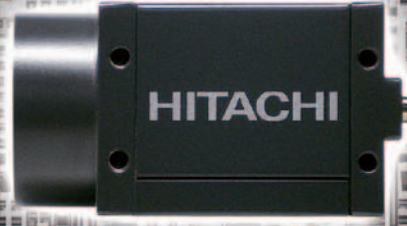
Such as KP-FD510GV



Such as KP-FMD200PCL



Such as KP-F200PCL



Such as KP-F230PCL



Such as KP-FD500GV



Such as KP-FD510WCL



KP-FM1200CL



KP-HD20A



HITACHI HV-HD33 3MOS HD COLOR CAMERA



# Camera Overview

## Digital Interface Cameras

### 3CCD Cameras

#### GigE Vision (Gigabit Ethernet)

HV-F202GV	1/1.8" 3CCD	UXGA (1600 x 1200)	28 fps	55(W) x 55(H) x 89(D) mm	Page 8
HV-F22GV	1/2" 3CCD	SXGA (1360 x 1024)	15 fps	65(W) x 65(H) x 141(D) mm	Page 7

#### Camera Link

HV-F22CL	1/2" 3CCD	SXGA (1360 x 1024)	15 fps	65(W) x 65(H) x 130(D) mm	Page 7
HV-F22CL-S1	1/2" 3CCD	SXGA (1360 x 1024)	15 fps	65(W) x 65(H) x 130(D) mm	Page 7
HV-F31CL	1/3" 3CCD	XGA (1024 x 768)	30 fps	65(W) x 65(H) x 130(D) mm	Page 7
HV-F31CL-S1	1/3" 3CCD	XGA (1024 x 768)	30 fps	65(W) x 65(H) x 130(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
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#### IEEE1394.a

HV-F22F	1/2" 3CCD	SXGA (1360 x 1024)	7.5 fps	65(W) x 65(H) x 130(D) mm	Page 7
HV-F31F	1/3" 3CCD	XGA (1024 x 768)	15 fps	65(W) x 65(H) x 130(D) mm	Page 7

### 1CCD Color Cameras

#### GigE Vision (Gigabit Ethernet)

KP-FD510GV	2/3" 1CCD	5M Pixels (2456 x 2058)	18 fps (RAW)	29(W) x 29(H) x 29(D) mm	Page 9
KP-FMD200GV	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps (RAW)	29(W) x 29(H) x 29(D) mm	Page 9
KP-FD500GV	2/3" 1CCD	5M pixel (2456 x 2058)	9 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-FD202GV	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-FD140GV	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-FD83GV	1/3" 1CCD	XGA (1034 x 779)	36 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-FD33GV	1/3" 1CCD	VGA (659 x 494)	90 fps	44(W) x 29(H) x 72(D) mm	Page 11

#### USB3 Vision

KP-FD510UB	2/3" 1CCD	5M Pixels (2456 x 2058)	18 fps (RAW)	29(W) x 29(H) x 29(D) mm	Page 10
KP-FMD200UB	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 20(D) mm	Page 10

#### Camera Link

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 21
KP-FD30CL	1/1.8" 1CCD	VGA (659 x 494)	60 fps	58(W) x 58(H) x 48(D) mm	Page 22

#### Mini Camera Link

KP-FD510WCL	2/3" 1CCD	5M pixel (2456 x 2058)	12 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-FD500SCL/PCL	2/3" 1CCD	5M pixel (2456 x 2058)	12 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-FD202SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-FD140SCL/PCL	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-FMD200PCL	1/1.8" CMOS	UXGA (1600 x 1200)	26 fps	29(W) x 29(H) x 20(D) mm	Page 17
KP-FMD100PCL	1/1.8" CMOS	SXGA (1280 x 1024)	30 fps	29(W) x 29(H) x 20(D) mm	Page 17

### 1CCD Color (RAW) Cameras

#### Mini Camera Link

KP-FR500WCL	2/3" 1CCD	5M pixel (2456 x 2058)	16 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-FMR400WCL	1" 1CMOS	4M pixel (2048 x 2048)	150 fps	44(W) x 44(H) x 41(D) mm	Page 14
KP-FR230SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	29(W) x 29(H) x 38(D) mm	Page 18
KP-FR200SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29(W) x 29(H) x 29(D) mm	Page 19
KP-FMR200WCL	2/3" 1CMOS	2M pixel (2048 x 1088)	280 fps	44(W) x 44(H) x 41(D) mm	Page 14
KP-FR80SCL/PCL	1/3" 1CCD	XGA (1034 x 779)	36 fps	29(W) x 29(H) x 29(D) mm	Page 19
KP-FR31SCL/PCL	1/3" 1CCD	VGA (659 x 494)	120 fps	29(W) x 29(H) x 38(D) mm	Page 18
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 18
KP-FR30PCL/SCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 19

### 1CCD Black & White Cameras

#### GigE Vision (Gigabit Ethernet)

KP-F500GV	2/3" 1CCD	5M pixel (2456 x 2058)	16 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-F202GV	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-F145GV	2/3" 1CCD NIR	SXGA (1392 x 1040)	30 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-F140GV	1/2" 1CCD	SXGA (1392 x 1040)	30 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-F83GV	1/3" 1CCD	XGA (1034 x 779)	36 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-F33GV	1/3" 1CCD	VGA (659 x 494)	90 fps	44(W) x 29(H) x 72(D) mm	Page 11
KP-F510GV	2/3" 1CCD	5M Pixels (2456 x 2058)	18 fps	29(W) x 29(H) x 29(D) mm	Page 9
KP-FM200GV	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 29(D) mm	Page 9
KP-F31GV	1/3" 1CCD	VGA (659 x 494)	125 fps	29(W) x 29(H) x 29(D) mm	Page 9
KP-F21GV	1/2" 1CCD	VGA (659 x 494)	125 fps	29(W) x 29(H) x 29(D) mm	Page 9

#### USB3 Vision

KP-F510UB	2/3" 1CCD	5M pixel (2456 x 2058)	18 fps	29(W) x 29(H) x 29(D) mm	Page 10
KP-FM200UB	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 20(D) mm	Page 10
KP-F31UB	1/3" 1CCD	VGA (659 x 494)	125 fps	29(W) x 29(H) x 20(D) mm	Page 10
KP-F21UB	1/2" 1CCD	VGA (659 x 494)	125 fps	29(W) x 29(H) x 20(D) mm	Page 10

# Camera Overview

## Digital Interface Cameras

1CCD Black & White Cameras					
Camera Link					
KP-FM1200CL	1.7" 1CMOS	12M pixel (4096 x 3072)	53 fps	55(W) x 55(H) x 45(D) mm	Page 13
KP-F120CL	2/3" CCD	SXGA (1392 x 1040)	30 fps	58(W) x 58(H) x 48(D) mm	Page 22
Mini Camera Link					
KP-F500WCL	2/3" 1CCD	5M pixel (2456 x 2058)	16 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-FM400WCL	1" 1CMOS	4M pixel (2048 x 2048)	150 fps	44(W) x 44(H) x 41(D) mm	Page 14
KP-F230SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	30 fps	29(W) x 29(H) x 38(D) mm	Page 18
KP-F200SCL/PCL	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29(W) x 29(H) x 29(D) mm	Page 19
KP-FM200WCL	2/3" 1CMOS	2M pixel (2048 x 1088)	280 fps	44(W) x 44(H) x 41(D) mm	Page 14
KP-F145WCL	2/3" 1CCD NIR	SXGA (1392 x 1040)	30 fps	44(W) x 44(H) x 41(D) mm	Page 15
KP-F80SCL/PCL	1/3" 1CCD	XGA (1034 x 779)	36 fps	29(W) x 29(H) x 29(D) mm	Page 19
KP-F31SCL/PCL	1/3" 1CCD	VGA (659 x 494)	120 fps	29(W) x 29(H) x 38(D) mm	Page 18
KP-F30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 19
KP-FB30SCL/PCL	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 18
KP-FM200PCL	1/1.8" 1CMOS	UXGA (1600 x 1200)	53 fps	29(W) x 29(H) x 20(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 17
PoCL Lite					
KP-F200Lite	1/1.8" 1CCD	UXGA (1628 x 1236)	15 fps	29(W) x 29(H) x 29(D) mm	Page 20
KP-F80Lite	1/3" 1CCD	XGA (1034 x 779)	36 fps	29(W) x 29(H) x 29(D) mm	Page 20
KP-F30Lite	1/3" 1CCD	VGA (659 x 494)	60 fps	29(W) x 29(H) x 29(D) mm	Page 20
KP-FM30Lite	1/3" 1CMOS	VGA (752 x 480)	90 fps	21.5(W) x 21.5(H) x 21.5(D) mm	Page 20
KP-FBM30Lite	1/3" 1CMOS	VGA (752 x 480)	90 fps	21.5(W) x 21.5(H) x 21.5(D) mm	Page 20

## HDTV Cameras

3CCD Cameras					
DK-H100	2/3" 3CCD	1080i (1920 x 1080)		99(W) x 105(H) x 155(D) mm	Page 23
DK-Z50	2/3" 3CCD	1080i (1920 x 1080)		99(W) x 105(H) x 155(D) mm	Page 23
HV-HD33	1/3" 3MOS	1080i / 720p (1280 x 720)		65(W) x 65(H) x 125(D) mm	Page 24
1CCD Color Cameras					
KP-HD1005	1/3" 1CMOS	1080 30P (1920 x 1080)		64(W) x 63(H) x 135(D) mm	Page 25
KP-HD1005-S2	1/3" 1CMOS	1080 30P (1920 x 1080)		64(W) x 63(H) x 135(D) mm	Page 25
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 135(D) mm	Page 25
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 135(D) mm	Page 25
KP-HD1001	1/3" 1CMOS	1080 30P (1920 x 1080)		64(W) x 63(H) x 135(D) mm	Page 25
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 25
KP-HD20A-S2	1/3" 1CMOS	1080 60P (1920 x 1080)		44(W) x 44(H) x 59(D) mm	Page 25

## Analog Interface Cameras

3CCD Cameras					
HV-D20	1/2" 3CCD	PAL (752 x 582)		65(W) x 65(H) x 130(D) mm	Page 27
HV-D30	1/3" 3CCD	NTSC (768 x 494), PAL (752 x 582)		65(W) x 65(H) x 80(D) mm	Page 27
1CCD Color Cameras					
KP-FD30	1/2" 1CCD	VGA (659 x 494), Progressive	60 fps	58(W) x 58(H) x 48(D) mm	Page 30
KP-FD30M	1/2" 1CCD	VGA (659 x 494), Progressive	60 fps	58(W) x 58(H) x 48(D) mm	Page 30
KP-D20B	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		44(W) x 44(H) x 49(D) mm	Page 28
KP-D20A	1/3" 1CCD	NTSC (768 x 494), PAL (752 x 582)		44(W) x 44(H) x 49(D) mm	Page 28
KP-D5001	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64(W) x 63(H) x 135(D) mm	Page 29
KP-D5000	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64(W) x 63(H) x 135(D) mm	Page 29
KP-D5010	1/2" 1CCD	NTSC (768 x 494), PAL (752 x 582)		64(W) x 63(H) x 64(D) mm	Page 29
1CCD Black & White Cameras					
KP-F80	1/3" 1CCD	XGA (1034 x 779), Progressive	30 fps	29(W) x 29(H) x 38.5(D) mm	Page 31
KP-F33	1/3" 1CCD	VGA (659 x 494), Progressive	30 fps	29(W) x 29(H) x 38.5(D) mm	Page 31
KP-F30	1/3" 1CCD	VGA (1034 x 779), Progressive	60 fps	29(W) x 29(H) x 38.5(D) mm	Page 31
KP-M30	1/3" 1CCD	EIA (768 x 494) CCIR (752 x 582)		29(W) x 29(H) x 38.5(D) mm	Page 32
KP-M20	1/3" 1CCD	EIA (768 x 494) CCIR (752 x 582)		29(W) x 29(H) x 38.5(D) mm	Page 32
KP-M3A	1/2" 1CCD	EIA (768 x 494) CCIR (752 x 582)		44(W) x 29(H) x 72(D) mm	Page 33
KP-M2A	1/2" 1CCD	EIA (768 x 494) CCIR (752 x 582)		44(W) x 29(H) x 72(D) mm	Page 33
KP-M2R	1/2" 1CCD NIR	EIA (768 x 494) CCIR (752 x 582)		44(W) x 29(H) x 72(D) mm	Page 33
KP-M1A	2/3" 1CCD	EIA (768 x 494) CCIR (752 x 582)		44(W) x 29(H) x 72(D) mm	Page 33

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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).

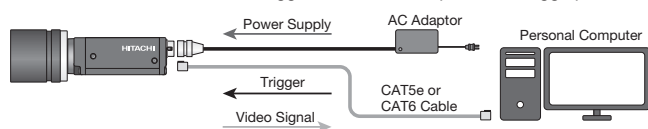
Power supply can be input via Ethernet cable for PoE enabled models (Power over Ethernet).

Applicable Models (PoE Enabled): KP-F21GV, KP-F31GV, KP-FM200GV, KP-FMD200GV, KP-F510GV, KP-FD510GV, HV-F202GV, KP-F500GV, KP-F202GV, KP-F145GV, KP-F140GV, KP-F83GV, KP-F33GV, KP-FD500GV, KP-FD202GV, KP-FD140GV, KP-FD83GV, KP-FD33GV

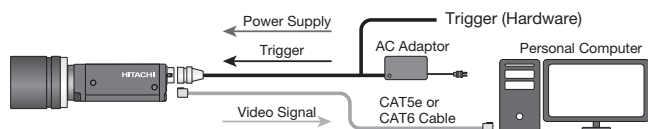
Applicable Models (PoE Non-enabled): HV-F22GV

### System Configuration (example)

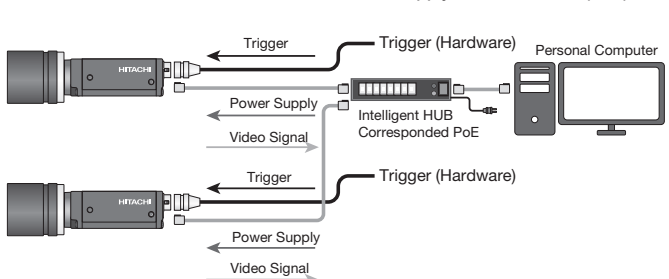
#### • Direct Connection to PC and Triggered via Ethernet (Software Trigger)



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



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





# Digital Interface Cameras

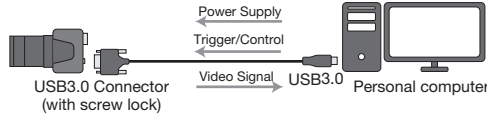
## About Digital Interface

### USB3 Vision

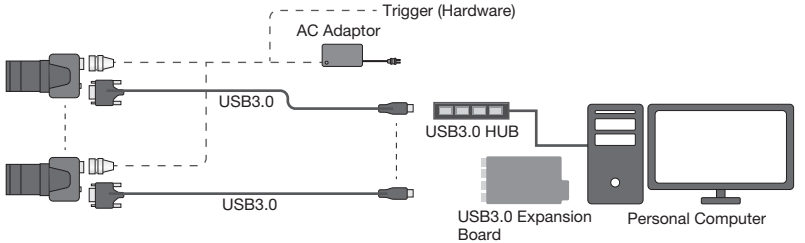
USB3 Vision is a camera interface with USB3.0 interface. It is the next generation standard for industrial camera interface to AIA (Automated Image Association) initiative. It is capable of high-speed transmission equivalent to the Camera Link (Medium Configuration) and about 10 times of USB2.0 by the effective bandwidth 350MB / second. System construction of reliable and low-cost and simple is possible by two-way transmission, connector with screw lock to achieve a reliable junction, connection with plug-and-play and power supply from USB cable. Also it is possible to reduce the CPU load due to DMA transfer, allowing acquisition of a stable, high real-time properties.

Applicable Models: KP-F21UB, KP-F31UB, KP-FM200UB, KP-FMD200UB, KP-F510UB, KP-FD510UB

#### • Simple Connection example



#### • Connection example of multiple Cameras using the expansion board or USB3.0 HUB



### Camera Link

CameraLink is a method that the standard of digital interface to connect the image input board and industrial cameras, and transmits the serial convert the RS-644. Connector, pin assignment, transmission scheme is being standardized. Depending on the application resolution, frame rate, and bit depth, there is a Base / Medium / Full configuration. In addition, there is a CameraLink normal, Mini CL [Non-PoCL type mini Camera Link, and PoCL Power over Camera Link that can be powered from a CameraLink cable] and PoCL-Lite depending on the size of the connector, cable diameter, cable line number.

#### Applicable Models

Model	Type of CameraLink	Configuration	
KP-FM400WCL	Mini CL (Auto Selection of PoCL or non-PoCL)	Base Medium Full-	
KP-FM200WCL			
KP-FMR400WCL			
KP-FMR200WCL		Base Medium	
KP-FD510WCL			
KP-F500WCL		Base	
KP-FR500WCL			
KP-F145WCL		Mini CL (PoCL)	Base Medium
KP-FD500PCL			
KP-FD202PCL			
KP-FD140PCL	Base		
KP-FM200PCL			
KP-FM100PCL			
KP-FMD200PCL			
LKP-FMD100PCL			
KP-F230PCL			
KP-F200PCL			
KP-F80PCL			

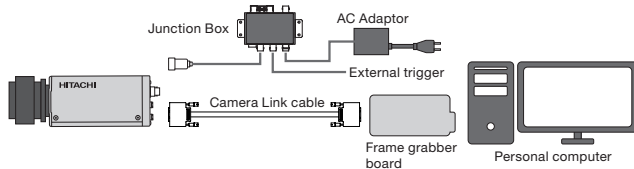
Model	Type of CameraLink	Configuration		
KP-F31PCL	Mini CL (PoCL)	Base		
KP-F30PCL				
KP-FB30PCL				
KP-FR230PCL				
KP-FR200PCL				
KP-FR80PCL				
KP-FR31PCL				
KP-FR30PCL				
KP-FD500SCL			Mini CL (Non-PoCL)	Base Medium
KP-FD202SCL				
KP-FD140SCL	Base			
KP-F230SCL				
KP-F200SCL				
KP-F80SCL	Base/ Medium			
KP-F31SCL				
KP-F30SCL				
KP-FB30SCL				
KP-FR230SCL				
KP-FR200SCL	Base			

Model	Type of CameraLink	Configuration
KP-FR80SCL	Mini CameraLink (Non-PoCL)	Base
KP-FR31SCL		
KP-FR30SCL		
KP-FBR30SCL		
HV-F202SCL		
KP-F200Lite	PoCL-Lite	Base
KP-F80Lite		
KP-F30Lite		
KP-FM30Lite	CameraLink	Base/ Medium/ Full
KP-FBM30Lite		
KP-FM1200CL		Base
KP-FMR830CL		
KP-F120CL		
KP-FD30CL	Base/ Medium	
HV-F22CL		
HV-F31CL		
HV-F22CL-S1	Base	
HV-F31CL-S1		

#### System Configuration for Camera Link normal (example)

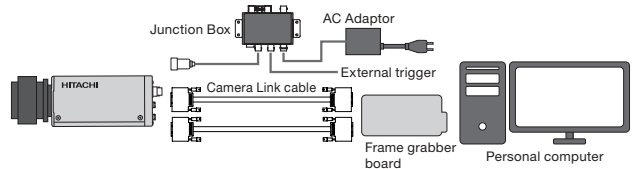
##### • Base Configuration (When using an external trigger)

Applicable Model: HV-F21CL, HV-F31CL, HV-F21CL-S1, HV-F31CL-S1, KP-F120CL, KP-FD30CL



##### • Medium Configuration (When using an external trigger)

Applicable Model: HV-F21CL, HV-F31CL



### Mini CL

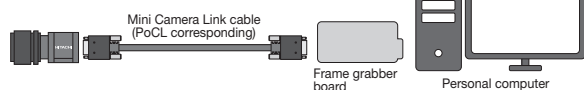
By adopting a Camera Link digital interface, higher speed video data transfer is possible. Furthermore, by adopting the small connector (SDR) of a Mini Camera Link standard, the size of the camera has been reduced.

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)

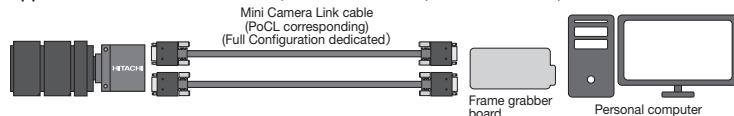
##### • Base Configuration

Applicable Model: WCL, PCL type all models



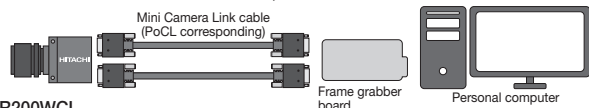
##### • Full Configuration

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



##### • Medium Configuration

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



# Digital Interface Cameras

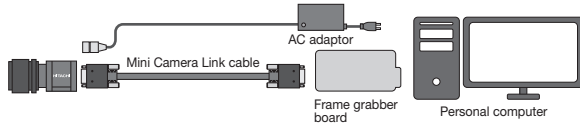
## About Digital Interface

### Mini CL

#### System Configuration for Non-PoCL (example)

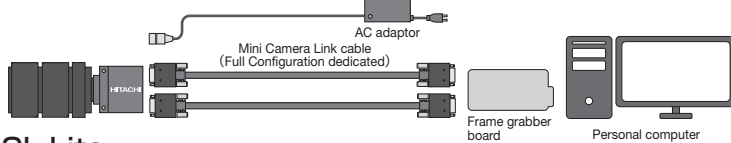
##### • Base Configuration

Applicable Model: WCL, SCL type all models



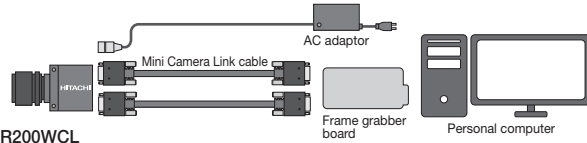
##### • Full Configuration

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



##### • Medium Configuration

Applicable Model: KP-FM400WCL, KP-FMR400WCL, KP-FM200WCL, KP-FMR200WCL, KP-F500WCL, KP-FD500PCL, KP-FD202PCL, KP-FD140PCL, HV-F202SCL

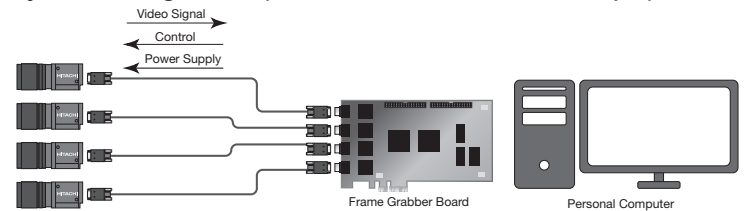


### PoCL-Lite

By be reduced to 14-pin from 26-pin of connecting line number, downsized to about three-fourths of the Mini CameraLink connector shape, and thinned even wire diameter. Because of PoCL (Power over Camera Link) capable, you can be done transmission of the video signal, the transmission of the control signal, the power supply with small-diameter single cable. Frame grabber board of 4CH correspondence can be achieved by the miniaturization of the connector. You can connect the PoCL-Lite 4 cameras to one frame grabber board.

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

#### System Configuration (Four camera connection example)

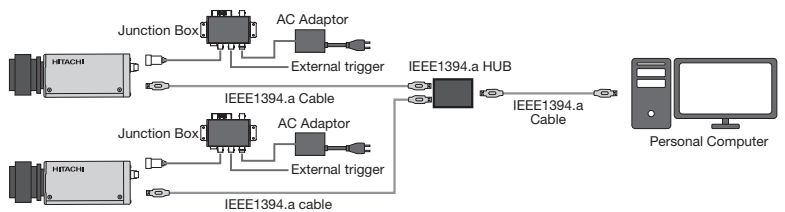


### IEEE1394.a

CameraLink is a method that the standard of digital interface to connect the image input board and industrial cameras, and transmits the serial convert the RS-644. Connector, pin assignment, transmission scheme is being standardized. Depending on the application resolution, frame rate, and bit depth, there is a Base / Medium / Full configuration. In addition, there is a CameraLink normal, Mini CL [Non-PoCL type mini Camera Link, and PoCL Power over Camera Link that can be powered from a CameraLink cable] and PoCL-Lite depending the size of the connector, cable diameter, cable line number.

Applicable Models: HV-F21F, HV-F31F

#### System Configuration (example)



## 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	
Camera Link	-CL models	
IEEE-1394.a	-F models	

### High Resolution & High Speed

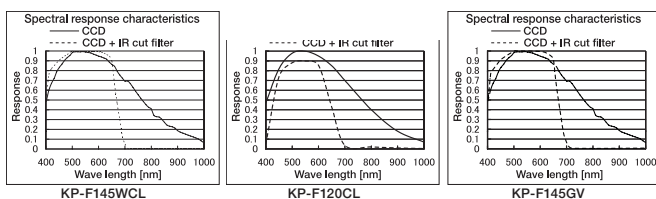
High resolution combined with high frame rates are possible with this series of cameras. Can be used for high-precision and high-speed image processing in many applications.

Such as KP-FM1200CL: 12.58 Mpixels / 53 fps,  
 KP-FM400WCL/-FMR400WCL: 4.19 Mpixels / 150 fps,  
 KP-FM200WCL/-FMR200WCL: 2.23 Mpixels / 280fps.

### Near infrared sensitivity

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

Applicable models: KP-F145WCL, KP-F120CL, KP-F145GV



### Compact and lightweight

The smallest model, and has realized the miniaturization of 21.5 (W) x 21,5 (H) x 21.5 (D) mm (PoCL-Lite), 29 (W) x 29 (H) x20 (D) mm (Mini CameraLink (PoCL), USB3 Vision).

	Dimensions WxHxDmm (Not including protrusions and lens)	Models
1CCD (CMOS) Models	21.5 x 21.5 x 21.5	KP-FM30Lite, KP-FBM30Lite, KP-FMR830
	29 x 29 x 20	KP-FM200PCL, KP-FMD200PCL, KP-FM100PCL, KP-FMD100PCL, KP-FM200UB, KP-FMD200UB, KP-F31UB, KP-F21UB
	29 x 29 x 29	KP-F200PCL/SCL, KP-F80PCL/SCL, KP-F30PCL/SCL, KP-FR200PCL/SCL, KP-FR80PCL/SCL, KP-FR30PCL/SCL, KP-F200Lite, KP-F80Lite, KP-F30Lite, KP-F510UB, KP-FD510UB, KP-F510GV, KP-FD510GV, KP-FM200UB, KP-FMD200UB, KP-F31GV, KP-F21GV
	29 x 29 x 38	KP-F230PCL/SCL, KP-F31PCL/SCL, KP-FR230PCL/SCL, KP-FR31PCL/SCL
	44 x 44 x 41	KP-FM400WCL, KP-FM200WCL, KP-FD510WCL, KP-F500WCL, KP-F145WCL, KP-FMR400WCL, KP-FMR200WCL, KP-FR500WCL, KP-FD500PCL/SCL, KP-FD202PCL/SCL, KP-FD140PCL/SCL
	55 x 55 x 45	KP-FM1200CL
	58 x 58 x 48	KP-F120CL, KP-FD30CL
	44 x 29 x 72	KP-F500GV, KP-F202GV, KP-F145GV, KP-F140GV, KP-F83GV, KP-F33GV, KP-FD500GV, KP-FD202GV, KP-FD140GV, KP-FD83GV, KP-FD33GV
	12 x 12.5 x 47.5	Camera Head: KP-FB30PCL/SCL, KP-FBR30PCL/SCL
	3CCD	55 x 55 x 89
65 x 65 x 130		KP-F22CL/F, KP-F31CL/F
65 x 65 x 141		LP-F22GV



# Digital Interface Cameras

## Main Features

### Four-sided attachment mechanism

Applicable Models: KP-FM200PCL/FMD200PCL/FM100PCL/FMD100PCL/FM1200CL

Can be Attached Four-side of the Camera, making it suitable for camera installation of the narrow portion.

### 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 Models)

RGB primary color mosaic filter achieve high color fidelity.

### Frame Shutter

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

### Multi-step Shutter

Electric shutter is Provided with Multi-step or variable speed. (Variable shutter except the KP-F120CL)

### Frame on Demand

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

### Remote Control

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

### Partial Scan

The start line and line 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.)

### Cropping mode

Applicable Models: KP-FM200PCL/FMD200PCL  
Can be read out by cropping the area of VGA/XGA/SXGA, can be read faster. (The 130 fps in VGA mode of KP-FM200PCL)

### Vertical subsampling Modes

Applicable Models: KP-FM1200CL, KP-F500WCL, KP-F145WCL, KP-F230PCL/SCL, KP-F31PCL/SCL  
Enables high-speed read by the vertical decimation of 2 to 10 times in KP-FM1200CL, 2 times (additional 2 pixels).

### Selectable White Balance Adjustment

Applicable Models: (KP-FDXXX Models, 3CCD Models)  
Selectable white balance adjustment method of ATW (auto-tracking), Manual (manual setting of R and B gain) or One-push (one-push auto adjustment).  
(For KP-FD30CL, ATW, Manual or AWC (Preset))

### 6-Vector Independent Masking

Applicable Models: (KP-FDXXX Models, 3CCD Models) (except KP-FD30CL)

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

### Selectable bit depth

Bit Depth	Applicable models
8 / 10 / 12	KP-F500WCL, KP-F145WCL, KP-FR500WCL, KP-F500GV, KP-F202GV, KP-F145GV, KP-F140GV, KP-F83GV, KP-F33GV
8 / 10	KP-FM1200CL, KP-FM400WCL, KP-FM200WCL, KP-F500WCL, KP-F145WCL, KP-FMR400WCL, KP-FMR200WCL, KP-FM200PCL, KP-FM100PCL, KP-F230PCL/SCL, KP-F200PCL/SCL, KP-F80PCL/SCL, KP-F31PCL/SCL, KP-F30PCL/SCL, KP-FB30PCL/SCL, KP-FR230PCL/SCL, KP-FR200PCL/SCL, KP-FR80PCL/SCL, KP-FR31PCL/SCL, KP-FR30PCL/SCL, KP-FBR30PCL/SCL, KP-F200Lite, KP-F80Lite, KP-F30Lite, KP-FM30Lite, KP-FBM30Lite, KP-F510UB, KP-FM200UB, KP-F31UB, KP-F21UB, KP-F510GV, KP-FM200GV, KP-F31GV, KP-F21GV
10	KP-F120CL
24 / 30 / 36	KP-FD510WCL, KP-FD500PCL/SCL, KP-FD202PCL/SCL, KP-FD140PCL/SCL, KP-FD500GV, KP-FD202GV, KP-FD140GV, KP-FD83GV, KP-FD33GV, KP-F202SCL/GV
24 / 30	KP-FD510UB, KP-FMD200UV, KP-FD510GV, KP-FMD200GV, HV-F22F, HV-F31F
30	HV-F22CL, HV-F31CL
24	KP-FMR830CL, KP-FMD200PCL, KP-FMD100PCL, KP-FD30CL, HV-F22CL-S1, HV-F31CL-S1, HV-F22GV

### Features for 3CCD Models

#### Adjustable sharpness (DTL) width

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

#### Auto shading (ASC)

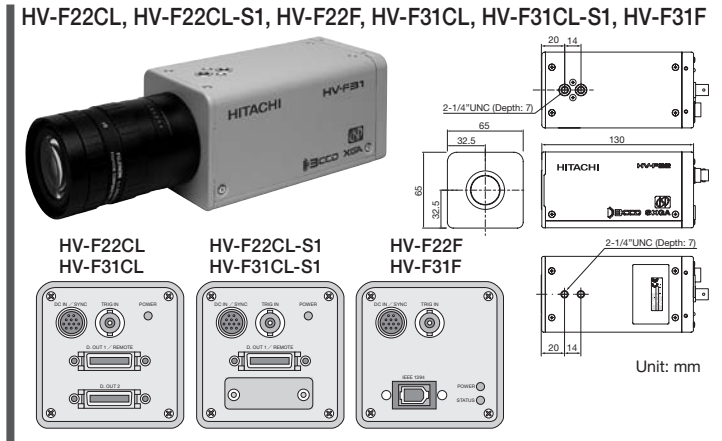
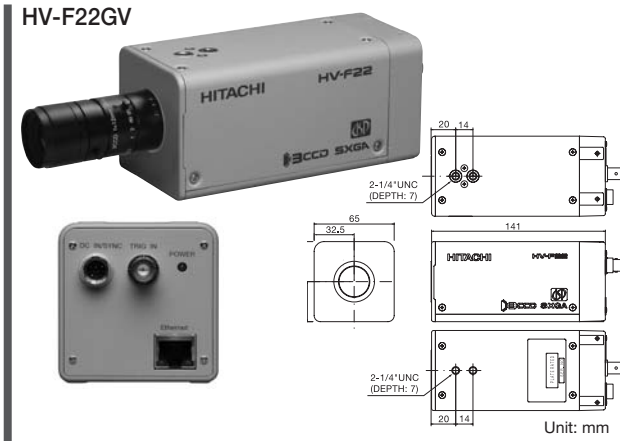
Color shading (uneven color) due to lens and lighting can be automatically corrected.

#### Versatile imaging functions

- Long time integration mode.
- Four application files.  
User settings provided for sharpness(detail), masking etc.
- Realtime automatic white balance function (ATW)  
adjustment. By varying the detection area in a scene, the whole white balance can be controlled in only the area. Thus, even if a light source of a different color temperature enters the scene (e.g., situation often occurs in a retail showroom suddenly exposed to outdoor lighting when the entrance door opens), white balance is not severely disturbed.
- Auto exposure (ALC: auto level control)  
Light strength is measured in divided 64 areas, combined with continued control of AGC and AES, to provide extremely wide response to light variations. And peak or average of ALC response can be set from menu.
- Two mode gain control  
AGC or user-programmable gain in 1 dB steps.
- Master black, R/B black, and R/B gain are variable.

# Digital Interface Cameras

<b>HV-F22GV</b>	GigE Vision	3CCD Color (RGB)	1/2" CCD	SXGA (1.39 M pixels)(1360 x 1024)	Max.15 frames per sec.	65(W) x 65(H) x 141(D) mm
<b>HV-F22CL</b>	CameraLink		1/3" CCD	XGA (0.79 M pixels) (1024 x 768)	Max. 30 frames per sec.	65(W) x 65(H) x 130(D) mm
<b>HV-F22CL-S1</b>						
<b>HV-F31CL</b>						
<b>HV-F31CL-S1</b>						
<b>HV-F22F</b>	IEEE1394.a	3CCD Color (RGB/YUV)	1/2" CCD	SXGA (1.39 M pixels) (1360 x 1024)	Max. 7.5 frames per sec.	65(W) x 65(H) x 130(D) mm
<b>HV-F31F</b>			1/3" CCD	XGA (0.79 M pixels) (1024 x 768)	Max. 15 frames per sec.	



		HV-F22GV	HV-F22CL HV-F22CL-S1	HV-F22F	HV-F31CL HV-F31CL-S1	HV-F31F
Imaging device	Effective pixels	1/2-inch progressive scan interline CCD (R, G, B 3 CCD)			1/3-inch interline CCD (RGB 3CCD)	
	Pixel size	1360(H) x 1024(V)			1024(H) x 768 (V)	
	Optical system	4.65 μm(H) x 4.65 μm(V) (Square pixel)			4.65 μm(H) x 4.65 μm(V) (Square pixel)	
	Flame rate	1/2-inch F1.6 prism			1/3-inch F2.2 prism	
Scanning area	6.32 mm (H) x 4.76 mm(V)			4.76 mm(H) x 3.53 mm(V)		
Scanning system	Progressive					
Sync system	Internal / VD external					
Lens mount	C mount					
Flange focal distance	17.526 mm					
Video output	Interface	Gigabit Ethernet IEEE802.3ab (1000BASE-T) GigaE Vision Support GenICam Support RGB (24 bit)	CameraLink HV-F22CL: Medium Configuration HV-F22CL-S1: Base Configuration	IEEE1394.a	CameraLink HV-F31CL: Medium Configuration HV-F31CL-S1: Base Configuration	IEEE1394.a
	Output Data	RGB 24 bit	HV-F22CL: RGB 30 bit HV-F22CL-S1: RGB 24 bit	RGB 16/24 bit YUV 16/24/48 bit	HV-F31CL: RGB 30 bit HV-F31CL-S1: RGB 24 bit	RGB 16/24 bit YUV 16/24/48 bit
	Image Size	1360(H) x 1024(V)			1024(H) x 768(V)	
	Flame rate	15 frames per second			7.5 frames per second	30 frames per second
Sensitivity	2000 lx, F8, 3200K (at 1/30 second shutter)			2000 lx, F5.6 (at 1/30 second shutter)		
Electric shutter	Variable	OFF / Auto(AES) / Manual (Variable)			1/30 to 1/100,000 second	
	AES	1/15 to 1/100,000 second			1/30 to 1/100,000 second	
	Long time integration	1/15 to approx. 4 second (1 frame step)			1/30 to approx. 4 second (1 frame step)	
External trigger	Mode	Fixed shutter, One trigger, VD sync reset				
	Input	Via Gigabit Ethernet cable or DC IN/SYNC connector	Via Camera Link cable, DC IN/SYNC connector or BNC connector	Via DC IN/SYNC connector or BNC connector	Via Camera Link cable, DC IN/SYNC connector or BNC connector	Via DC IN/SYNC connector or BNC connector
Input level	Low: 0 V DC, High: 3 to 24 V DC					
External sync signal (Strobe out)	Flash out					
Screen distortion	All Screen: 0% (except lens characteristics)					
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 (10.5 V to 15 V DC without ripple)					
Power consumption	Approx. 9.0 W (DC+12 V)	Approx. 6.5 W (DC+12 V)	Approx. 8.5 W (DC+12 V)	Approx. 6.0 W (DC+12 V)	Approx. 8.0 W (DC+12 V)	
Ambient temperature	Operating	0 °C to +40 °C				
	Storage	-20 °C to +60 °C				
Vibration endurance	10 to 200 Hz 24.5 m/s <sup>2</sup>					
Shock endurance	392 m/s <sup>2</sup>					
External dimensions	65(W) x 65(H) x 141(D) mm (not including lens and protrusions)		65(W) x 65(H) x 130(D) mm (not including lens and protrusions)			
Mass	Approx. 600 g (without lens)					



# Digital Interface Cameras

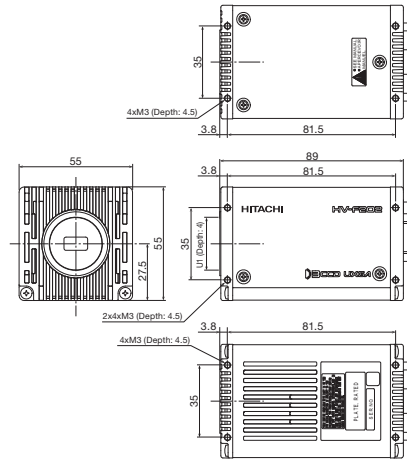
<b>HV-F202GV</b>	GigE Vision	3CCD Color (RGB/YUV)	1/1.8" CCD	UXGA (1.92M pixels) (1600 x 1200)	Max.28 frames per sec. (YUV 24 bits)	55(W) x 55(H) x 89(D) mm
<b>HV-F202SCL</b>	MiniCL (Non-PoCL)	3CCD Color (RGB)			Max.30 frames per sec.	



HV-F202SCL



HV-F202GV

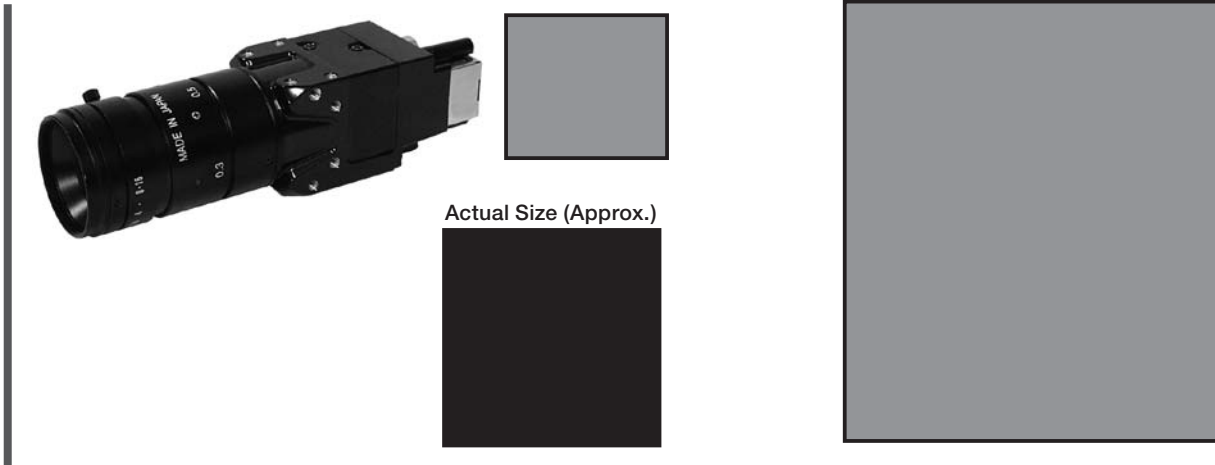


Unit: mm

		HV-F202GV	HV-F202SCL			
Imaging device		1/1.8-inch progressive scan interline CCD (R, G, B 3 CCD)				
	Effective pixels	1600(H) x 1200(V)				
	Pixel size	4.4 μm(H) x 4.4 μm(V) (Square pixel)				
	Optical system	1/1.8-inch F1.8 prism				
Scanning area		7.04 mm(H) x 5.28 mm(V)				
Scanning system		Progressive				
Sync system		Internal / VD external				
Lens mount		C mount				
Flange focal distance		17.526 mm				
Video output		Gigabit Ethernet IEEE802.3ab (1000BASE-T) GigaE Vision Support GenICam Support RGB (24 bit/30 bit/ 36 bit), RAW (24 bit/30 bit/ 36 bit), YUV (24 bit/30 bit/ 36 bit)			Camera Link support Base Configuration / Medium Configuration Base Configuration: RGB 24bit Medium Configuration: RGB 30bit / RGB 36bit	
Frame rate		Frame rate (frames per second)			30 frames per second	
			24 bit	30 bit		36 bit
		RGB	18	12		9
	YUV	28	18	18		
Sensitivity		2000 lx, F5.6, 3200K (at 1/30 second shutter)				
		OFF / Auto(AES) / Manual (Variable)				
Electric shutter	Variable	1/30 to 1/100,000 second				
	AES	1/30 to 1/100,000 second				
	Long time integration	1/30 to approx. 4 second (1 frame step)				
External trigger	Mode	Fixed shutter, One trigger, VD sync reset				
	Input	Via Gigabit Ethernet cable or DC IN/SYNC connector		Via CameraLink 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), 48V (PoE)		DC+12 V ±1 V (from DC IN / SYNC connector)		
Power consumption		Approx. 7.8 W (DC+12 V)		Approx. 7.2 W (DC+12 V)		
	Operating	0 °C to +40 °C (without dew condensation)				
	Storage	-20 °C to +60 °C				
Vibration endurance		10 to 200 Hz 24.5 m/s <sup>2</sup>				
Shock endurance		392 m/s <sup>2</sup>				
External dimensions		55(W) x 55(H) x 89(D) mm (not including lens and protrusions)				
Mass		Approx. 350 g (without lens)				

# Digital Interface Cameras

<b>KP-FD510GV</b>	GigE Vision	1CCD Color (RGB/RAW)	2/3" CCD	5.05 M Pixels (2456 x 2058)	Max. 18 frames per sec. (RAW) Max. 12 frames per sec. (RGB)	29(W) x 29(H) x 29(D) mm
<b>KP-F510GV</b>		1CCD Black & Withe			Max. 18 frames per sec.	
<b>KP-FMD200GV</b>		1CMOS Color (RGB/RAW)	1/1.8" CMOS	UXGA (1.92 M Pixels) (1600 x 1200)	Max. 53 frames per sec. (RAW) Max. 30 frames per sec. (RGB)	
<b>KP-FM200GV</b>		1CMOS Black & Withe			Max. 53 frames per sec.	
<b>KP-F31GV</b>		1CCD Black & Withe	1/3" CCD	VGA (0.32 M Pixels) (656 x 494)	Max. 125 frames per sec.	
<b>KP-F21GV</b>		1CCD Black & Withe	1/2" CCD			

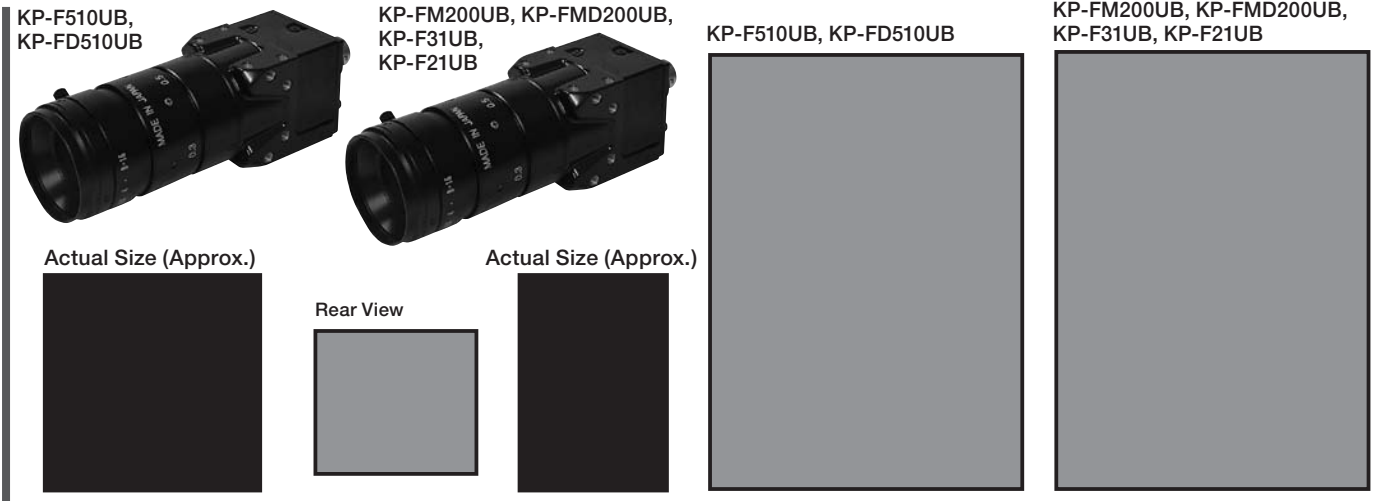


		<b>KP-FD510GV KP-F510GV</b>	<b>KP-FMD200GV KP-FM100GV</b>	<b>KP-F31GV</b>	<b>KP-F21GV</b>
Imaging device		2/3-inch progressive scan interline CCD (XXXXXX)	1/1.8-inch CMOS (XXXXXX)	1/3-inch progressive scan interline CCD (XXXXXX)	1/2-inch progressive scan interline CCD (XXXXXX)
	Total pixels	2456(H) x 2058(V)	1688(H) x 1248(V)	656(H) x 494(V)	
	Effective pixels				
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)	4.5 μm(H) x 4.5 μm(V) (Square pixel)		
Color filter (FD/FMD model)		RGB primary color mosaic filter			-
Scanning area					
Scanning system		Progressive			
Sync system		Internal / external			
Lens mount		C mount (Flange focal distance: 17.526 mm)			
Video output	Interface	Gigabit Ethernet			
	Protocol	GigE Vision compliant			
	Transfer rate	1 Gbit per second			
	Image format	FD/FMD model: RGB/RAW F/FM model: B/W 8 bit		B/W 8 bit	
	Image size				
Frame rate	18 frames per second (RAW) 12 frames per second (RGB)	53 frames per second (RAW) 30 frames per second (RGB)			
Sensitivity					
Electric shutter speed	PRESET				
	VARIABLE				
External trigger shutter	Mode				
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)			
External sync signal	VD output				
	Strobe out				
Partial scan					
ALC (Auto level control) (FD/FMD model)					
White balance(FD/FMD model)					
Gain					
Gamma					
Color masking (FD/FMD model)					
Paint black, Sharpness, Black level, Knee (FD/FMD model)		Adjustable			
Power supply					
Power consumption	Normal				
	Partial scan				
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less			
	Operating	-10 °C to +50 °C / 90 %RH or less			
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)			
Vibration endurance		15 to 200 to 15Hz (98.6m/S <sup>2</sup> ), 10 minutes for each 3 axis			
Shock endurance		490.3 m/s <sup>2</sup> (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

<b>KP-FD510UB</b>	USB3 Vision	1CCD Color (RGB/RAW)	2/3" CCD	5.05 M Pixels (2456 x 2058)	Max. 18 frames per sec. (RAW)	29(W) x 29(W) x 29(D) mm
<b>KP-F510UB</b>		1CCD Black & White			Max. 12 frames per sec. (RGB)	
<b>KP-FMD200UB</b>		1CMOS Color (RGB/RAW)	1/1.8" CMOS	UXGA (1.92 M Pixels) (1600 x 1200)	Max. 53 frames per sec.	29(W) x 29(W) x 20(D) mm
<b>KP-FM200UB</b>		1CMOS Black & White				
<b>KP-F31UB</b>		1CCD Black & White	1/3" CCD	VGA (0.32 M Pixels) (656 x 494)	Max. 125 frames per sec.	
<b>KP-F21UB</b>		1CCD Black & White	1/2" CCD			



		KP-FD510UB KP-F510UB	KP-FMD200UB KP-FM200UB	KP-F31UB	KP-F21UB
Imaging device		2/3-inch progressive scan interline CCD (XXXXXX)	1/1.8-inch CMOS (XXXXXX)	1/3-inch progressive scan interline CCD (XXXXXX)	1/2-inch progressive scan interline CCD (XXXXXX)
	Total pixels	2456(H) x 2058(V)	1688(H) x 1248(V)	656(H) x 494(V)	
	Effective pixels				
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square pixel)	4.5 μm(H) x 4.5 μm(V) (Square pixel)		
	Color filter (FD/FMD model)	RGB primary color mosaic filter			-
Scanning area					
Scanning system		Progressive			
Sync system		Internal / external			
Lens mount		C mount (Flange focal distance: 17.526 mm)			
Video output	Interface	USB 3.0			
	Protocol	USB3 Vision compliant			
	Image format	FD/FMD model: RGB/RAW	F/FM model: B/W 8 bit	B/W 8 bit	
	Image size				
	Frame rate	18 frames per second (RAW) 12 frames per second (RGB)	53 frames per second (RAW)		
Sensitivity					
Electric shutter speed	PRESET				
	VARIABLE				
External trigger shutter	Mode				
	Input	Via USB3.0 cable (Software trigger), 12-pin connector (Hardware trigger)			
	Input level				
External sync signal	VD output				
	Strobe out				
Partial scan					
ALC (Auto level control) (FD/FMD model)					
White balance(FD/FMD model)					
Gain					
Gamma					
Color masking (FD/FMD model)					
Paint black, Sharpness, Black level, Knee (FD/FMD model)		Adjustable			
Power supply					
Power consumption	Normal				
	Partial scan				
Ambient temperature	Performance	0 °C to +40 °C / 90 %RH or less			
	Operating	-10 °C to +50 °C / 90 %RH or less			
	Storage	-20 °C to +60 °C / 70 %RH or less (without dew condensation)			
Vibration endurance		15 to 200 to 15Hz (98.6m/S <sup>2</sup> ), 10 minutes for each 3 axis			
Shock endurance		490.3 m/s <sup>2</sup> (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

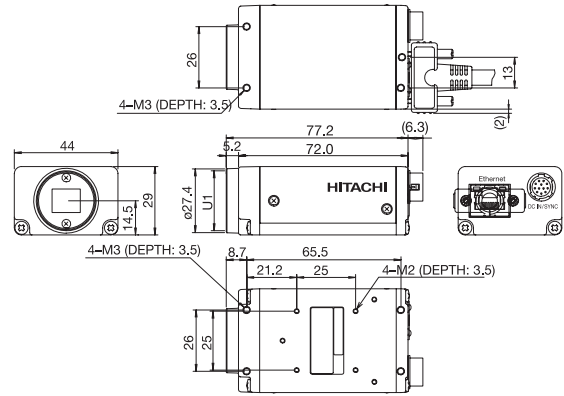
<b>KP-FD500GV</b>	GigE Vision	1CCD Color (RGB/YUV/RAW)	2/3" CCD	5.05 M Pixels (2456 x 2058)	Max. 9 frames per sec.	44(W) x 29(W) x 72(D) mm
<b>KP-F500GV</b>		1CCD Black & White				
<b>KP-FD202GV</b>		1CCD Color (RGB/YUV/RAW)	2/3" CCD	SXGA (1.45 M Pixels) (1392 x 1040)	Max. 30 frames per sec.	
<b>KP-F202GV</b>		1CCD Black & White				
<b>KP-F145GV</b>		1CCD Black & White (Near infrared sensitivity)	1/3" CCD	VGA (0.33 M Pixels) (659 x 494)	Max. 18 frames per sec.	
<b>KP-FD140GV</b>		1CCD Color (RGB/YUV/RAW)				
<b>KP-F140GV</b>		1CCD Black & White	1/3" CCD	VGA (0.33 M Pixels) (659 x 494)	Max. 18 frames per sec.	
<b>KP-FD83GV</b>		1CCD Color (RGB/YUV/RAW)				
<b>KP-F83GV</b>		1CCD Black & White	1/3" CCD	VGA (0.33 M Pixels) (659 x 494)	Max. 18 frames per sec.	
<b>KP-FD33GV</b>		1CCD Color (RGB/YUV/RAW)				
<b>KP-F33GV</b>	1CCD Black & White	1/3" CCD	VGA (0.33 M Pixels) (659 x 494)	Max. 18 frames per sec.		

		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	2536(H) x 2068(V)	1688(H) x 1248(V)	1432(H) x 1050(V)
	Effective pixels	2456(H) x 2058(V)	1628(H) x 1236(V)	1392(H) x 1040(V)
	Pixel size	3.45 μm(H) x 3.45 μm(V) (Square 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	8.45 mm(H) x 7.07 mm(V)	7.13 mm(H) x 5.37 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 2050(V)	1620(H)x 1220(V)	1360(H)x 1024(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, F11, 3200K KP-F500GV: 400 lx, F11, 3200K	KP-FD202GV: 2000 lx, F5.6, 3200K KP-F202GV: 2000 lx, F11, 3200K	400 lx, F4, 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 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 (0dB to 12dB)		Auto / Manual (0dB to 18dB)	
Gamma	OFF (γ=1)/LUT			
Image adjustment function		Sharpness, Black level		
		In addition to the above, FD model color masking (6 color independent masking), painted black, knee		
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 <sup>2</sup> ), 10 minutes for each 3 axis			
Shock endurance	490.3 m/s <sup>2</sup> (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



Actual Size (Approx.)



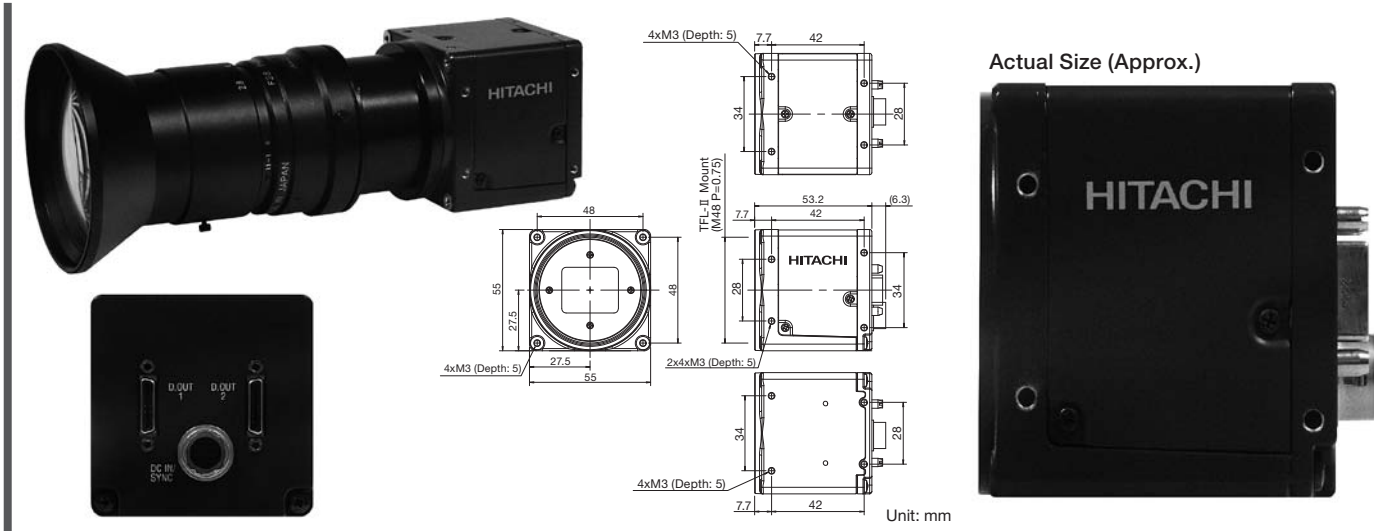
Unit: mm

		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)	1034(H) x 779(V)	659(H) x 494(V)
	Pixel size	4.65 μm(H) x 4.65 μm(V) (Square pixel)		7.4 μm(H) x 7.4 μm(V) (Square pixel)
	Color filter (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
	VARIABLE	From 10 second to approx. 1/100000 second		
External trigger	Mode	Fixed shutter, One trigger, VD Sync, Reset control		
	Input	Via Gigabit Ethernet cable (Software trigger), 12-pin connector (Hardware trigger)		
	Input level	+5 to 24 V		
External sync signal	VD output	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 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 (0dB to 12dB)	Auto / Manual (0dB to 18dB)	
Gamma		OFF(γ=1)/LUT		
Image adjustment function		Sharpness, Black level In addition to the above, FD model color masking (6 color independent masking), painted black, knee		
Power supply		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 <sup>2</sup> ), 10 minutes for each 3 axis		
Shock endurance		490.3 m/s <sup>2</sup> (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

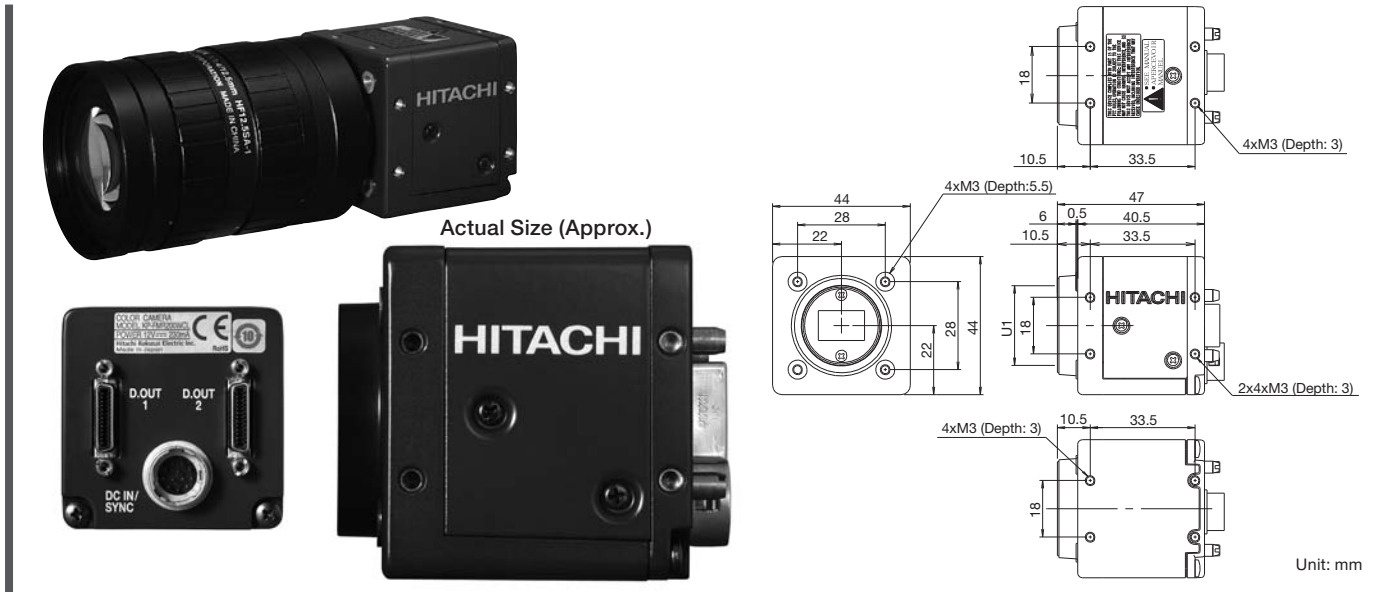
<b>KP-FM1200CL</b>	CameraLink	1CMOS Black & White	1.7" CMOS	12.58 M pixels (4096 x 3072)	Max. 53 frames per sec.	55(W) × 55(H) × 45(D) mm
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Imaging device	Total pixels	1.7-inch global shutter system CCD	
	Effective pixels	4096(H) x 3072(V)	
	Pixel size	5.5 μm(H) x 5.5 μm(V) (square lattice)	
	Sensing area	22.5 mm (H) x 16.9 mm (V)	
Scanning system	Progressive		
Aspect ratio	4 : 3		
Frame rate (Max.)	53 frames per second (full pixel readout)		
Horizontal drive frequency	42.0000 MHz		
Horizontal 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): 30.348 kHz	
Vertical Scanning frequency	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) : 6.615Hz	
Vertical subsampling Modes	OFF (1 times) / 2 times / 3 times / 4 times / 5 times / 6 times / 7 times / 8 times / 9 times / 10 times		
Sync system	Internal		
Lens mount	TFL-II Mount (Flange focal distance =17.5 mm), (F-mount adaptor: Option)		
Video output	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)×3072(V)(pixel readout)		
Resolution	Horizontal/Vertical: 3000 TV lines		
Sensitivity	400 lx, F5.6, 3200 K (Exposure time: 100μs)		
Minimum illumination			
S/N	48 dB		
Electric shutter	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 (40.5μs to 1.0s, 49.1μs step)		
Gain	1 to 4 times		
Offset level	0/255 to 127/255		
Gamma	γ=1		
Frame on demand	Mode	Fixed shutter (8 steps or variable), ONE trigger mode	
	Trigger input	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	Applx. 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 55Hz (2.37 to 71.7m/S <sup>2</sup> ), Sweep 1minute, 30 minutes for each 3 axis		
Shock endurance	490.3 m/s <sup>2</sup> (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

<b>KP-FMR400WCL</b>	Mini CL (Auto Selection of PoCL or non-PoCL)	1CMOS Color (RAW)	1" CMOS	4.19 M pixels (2048 x 2048)	Max. 150 frames per sec.	44(W) x 44(H) x 41(D)mm
<b>KP-FM400WCL</b>		1CMOS Black & White				
<b>KP-FMR200WCL</b>		1CMOS Color (RAW)	2/3" CMOS	2.23 M pixels (2048 x1088)	Max. 280 frames per sec.	
<b>KP-FM200WCL</b>		1CMOS Black & White				



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

# Digital Interface Cameras

<b>KP-FD510WCL</b>	Mini CL (Auto Selection of PoCL or non-PoCL)	1CCD Color (RGB)	2/3" CCD	5.05 M Pixels (2456 x 2058)	Max. 12 frames per sec.	44(W) x 44(H) x 41(D) mm
<b>KP-FR500WCL</b>		1CCD Color (RAW)				
<b>KP-F500WCL</b>		1CCD Black & White				
<b>KP-FD500PCL/SCL</b>	PCL: Mini CL(PoCL)	1CCD Color (RGB)	1/1.8" CCD	UXGA(2.01M Pixels) (1628 x 1236)	Max. 30 frames per sec.	
<b>KP-FD202PCL/SCL</b>	SCL: Mini CL(Non-PoCL)		1/2" CCD	SXGA(1.45M Pixels) (1392 x 1040)		
<b>KP-FD140PCL/SCL</b>	Mini CL (Auto Selection of PoCL or non-PoCL)		2/3" CCD			

KP-FD510WCL



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



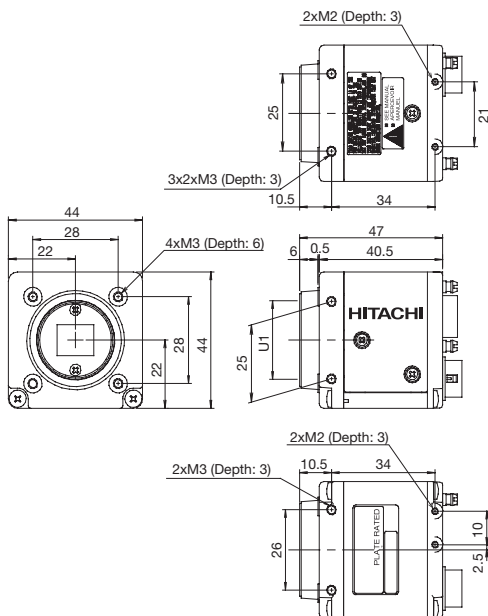
KP-FD202PCL/SCL,  
KP-FD140PCL/SCL



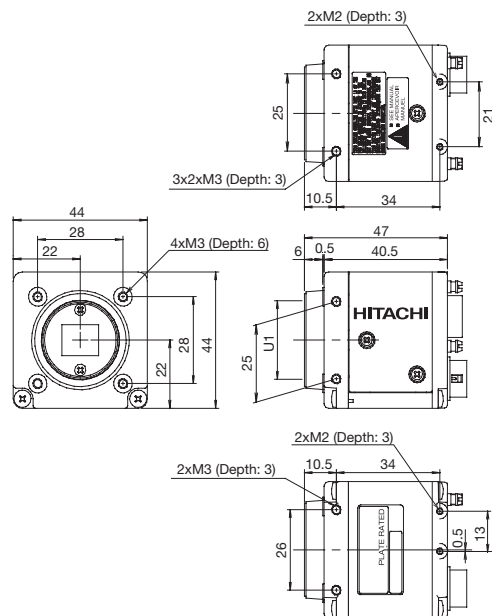
Actual Size (Approx.)



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	2536(H) x 2068(V)		1688(H) x 1248(V)	1434 (H) x 1050 (V)	1432 (H) x 1050 (V)	
	Effective pixels	2448(H) x 2050(V)	2456 (H) x 2058 (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) 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		32.07 kHz	
Vertical Scanning frequency	11.99 Hz	16.00 Hz (full pixel readout) 31.98 Hz (vertical 2 pixel additionmode) 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 additionmode)	
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 Base configuration (1ch: SDR connector x 1pc.) Medium configuration (2ch: SDR connector x 2pcs)	Camera Link 57.6000 MHz	Camera Link Base configuration: 28.8000 MHz x 2TAP	
	Output format	24bits (Base configuration) 30bits (Medium configuration) 36bits (Medium configuration)	8 bit / 10bit / 12bit	24bits (Base configuration) 30bits (Medium configuration) 36bits (Medium configuration)	8 bit / 10bit / 12bit		
	Output image size	2448 (H) x 2050 (V) (full pixel readout)	2456(H) x 2058(V) (fullpixel readout)	1620(H) x 1220(V) (full pixel readout)	1360(H) x 1024(V) (full pixel readout)	1392(H) x1040(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					
	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 +12dB) (Approx. 0.0358dB step)	Auto/Manual (0 to +18dB) (Approx. 0.0358dB step)	Auto/Manual (0 to +18dB) (Approx. 0.0358dB step)		Auto/Manual (-6 to +18dB) (Approx. 0.0358dB 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. 3.7W)	Approx. 260 mA (Approx. 3.1W) *MAX partial scan 1H: Approx. 330 mA (Approx. 4.0W)	Approx. 340 mA (Approx. 4.1W) *MAX partial scan 1H: Approx. 415 mA (Approx. 5.0W)	Approx. 300 mA (Approx. 3.6W)	Approx. 230 mA (Approx. 2.8W) *MAX partial scan 1H: Approx. 350 mA (Approx. 4.2W)		
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH					
	Operation	–10 to +50 °C (+14 to +122 °F), less than 90 % RH					
	Storage	–20 to +60 °C (–4 to +140 °F), less than 70 % RH (without dew condensation)					
Vibration endurance	10 to 55Hz (2.37 to 71.7m/S <sup>2</sup> ), Sweep 1 minute, 30 minutes for each 3 axis						
Shock endurance	490.3 m/s <sup>2</sup> (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

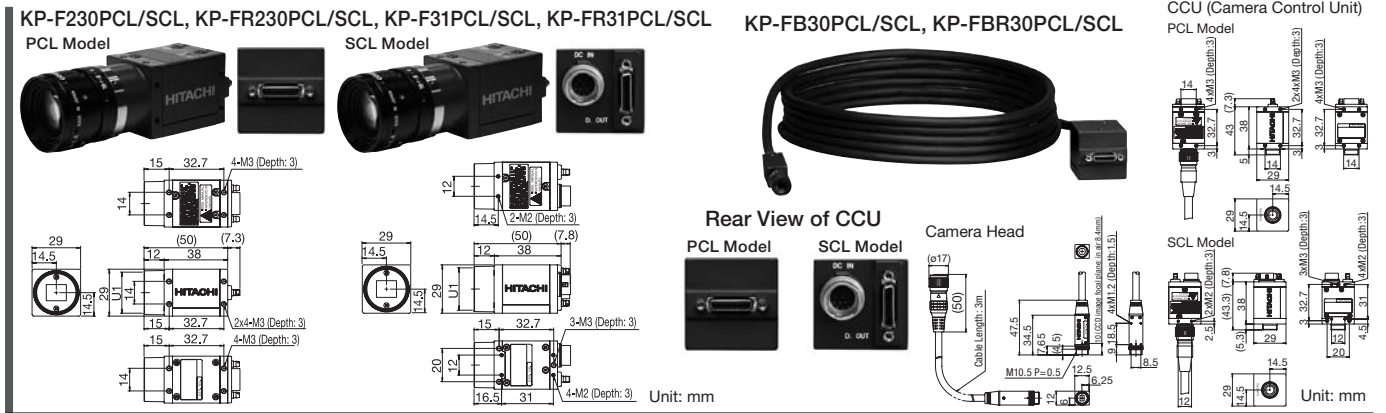
<b>KP-FM200PCL</b>	Mini CL (PoCL)	1CMOS Black & White	1/1.8" CMOS	UXGA(1.92 M pixel) (1600 x 1200)	Max. 53 frames per sec.	29(W) x 29(H) x 20(D) mm
<b>KP-FMD200PCL</b>		1CMOS Color (RGB)			Max. 26 frames per sec.	
<b>KP-FM100PCL</b>		1CMOS Black & White		SXGA(1.31 M pixel) (1280 x 1024)	Max. 61 frames per sec.	
<b>KP-FMD100PCL</b>		1CMOS Color (RGB)			Max. 30 frames per sec.	



		KP-FM200PCL	KP-FMD200PCL	KP-FM100PCL	KP-FMD100PCL
Imaging device		1/1.8-inch CMOS (XXXXXX)			
	Total pixels				
	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		53 frames per second (full pixel readout)	26 frames per second (full pixel readout)	61 frames per second (full pixel readout)	30 frames per second (full pixel readout)
Horizontal Drive Frequency		114 MHz		42 MHz	
Horizontal scanning frequency		64.773 kHz		63.616 kHz	
Vertical scanning frequency		53.180 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:	57.0000 MHz x 2 TAP		Base configuration: 57.0000 MHz x 2 TAP	
	8 bits / 10 bits	24 bits		8 bits / 10 bits	
Output image size:		1600 (H) x 1200 (V) (full pixel readout)		Output image size: 1628 (H) x 1236 (V) (full pixel readout)	
Sensitivity		400lx, F2.8, 3200K		400lx, F4, 3200K	
Minimum illumination					
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		γ = 1	
Frame on demand	Mode	Fixed shutter mode (8 steps or variable),			
	Trigger input	Camera Link (CC1)			
Gamma		Selectable start position and height of picture grabbing in 1 pixel step. (Minimum area :20x20 pixels)			
Cropping mode		VGA(130 fps)/XGA(82 fps)/SXGA(62 fps)	VGA( fps)/XGA( fps)/SXGA( fps)	-	-
Gain		1 to 2 times (128 steps)			
Power supply voltage		12 ± 1 VDC			
Current consumption		Approx. 80mA (Approx. 0.96W)		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 (98m/S <sup>2</sup> ), Sweep 10 minute, 30 minutes for each 3 axis			
Shock endurance		686 m/s <sup>2</sup> (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

<b>KP-F230PCL/SCL</b>	PCL: Mini CL(PoCL)	1CCD Black & White	1/1.8" CCD	UXGA (2.01 M pixels) (1628 x 1236)	Max. 30 frames per sec.	29(W) x 29(W) x 38(D) mm
<b>KP-FR230PCL/SCL</b>		1CCD Color(RAW)				
<b>KP-F31PCL/SCL</b>	SCL: Mini CL (Non-PoCL)	1CCD Black & White	1/3" CCD	VGA (0.33 M Pixels) (659 x 494)	Max. 120 frames per sec.	Camera Head: 12(W) x 12.5(H) x 47.5(L)mm
<b>KP-FR31PCL/SCL</b>		1CCD Color(RAW)				
<b>KP-FB30PCL/SCL</b>		1CCD Black & White				
<b>KP-FBR30PCL/SCL</b>		1CCD Color(RAW)			Max. 60 frames per sec.	

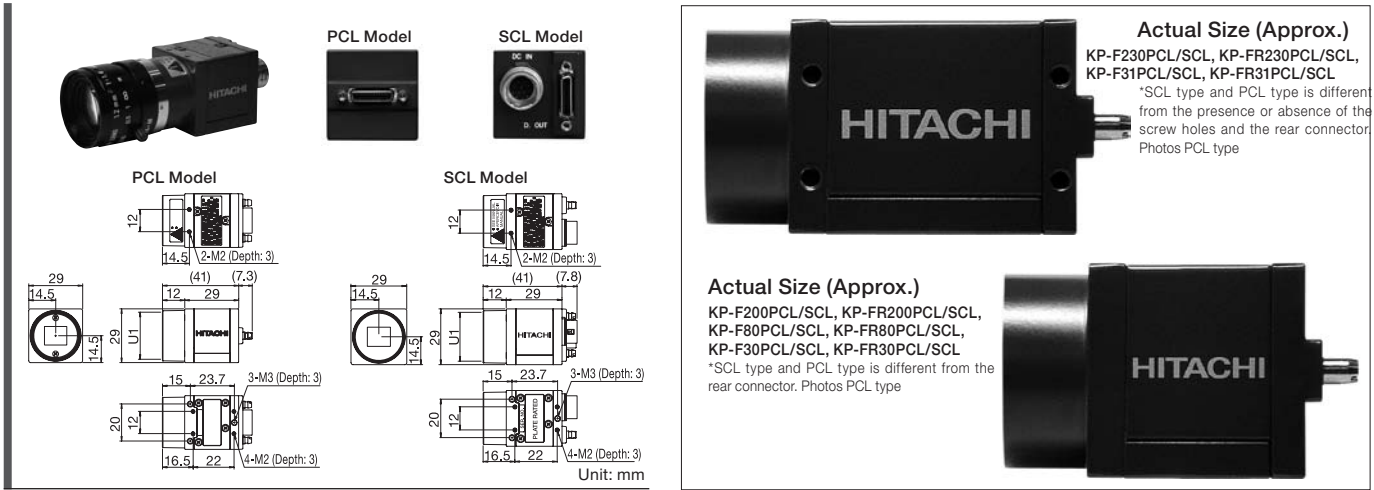


		<b>KP-FR230SCL/PCL KP-F230SCL/PCL</b>	<b>KP-FR31SCL/PCL KP-F31SCL/PCL</b>	<b>KP-FBR30SCL/PCL KP-FB30SCL/PCL</b>
Imaging device		1/1.8-inch interline CCD (ICX274AL)		1/3-inch interline CCD (ICX424AL)
	Total pixels	1688 (H) x 1248 (V)		692 (H) x 504 (V)
	Effective pixels	1628 (H) x 1236 (V)		659 (H) x 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) *MAX partial scan 1H: Approx. 360 mA (approx. 4.3W)		Approx. 190 mA (approx. 2.3 W) *MAX partial scan 1H: Approx. 230 mA (approx. 2.8 W)	
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	-10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance	10 to 200Hz (98 m/s <sup>2</sup> ). Sweep 10 minute, 30 minutes for each 3 axis			
Shock endurance	686 m/s <sup>2</sup> (Once for each side of top, under, left and right)			
External dimensions	29 (W) x 29 (W) x 38 (D) mm (Not including protrusions)			Head: 12 (W) x 12.5 (H) x 47.5 (D) mm CCU: 29 (W) x 29 (H) x 38 (D) mm
Mass	Approx. 50 g			Head: Approx. 18 g CCU: Approx. 50g (without cable)



# Digital Interface Cameras

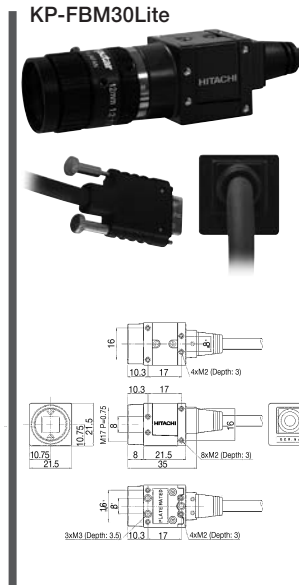
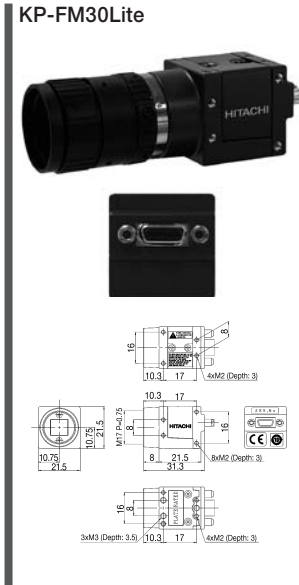
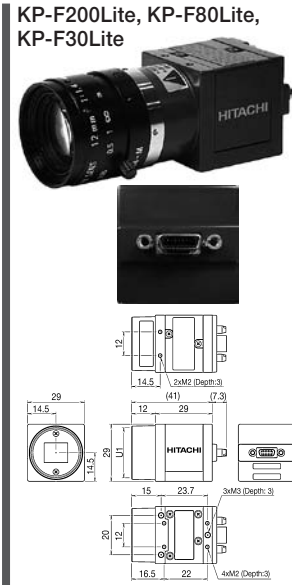
<b>KP-F200PCL/SCL</b>	PCL: Mini CL(PoCL)	1CCD Black & White	1/1.8" CCD	UXGA(2.01 M pixel) (1628 x 1236)	Max. 15 frames per sec.	29(W) x 29(W) x 29(D) mm
<b>KP-FR200PCL/SCL</b>		1CCD Color(RAW)				
<b>KP-F80PCL/SCL</b>	SCL: Mini CL (Non-PoCL)	1CCD Black & White	1/3" CCD	XGA(0.81 M pixel) (1034 x 779)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



		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		Horizontal / Vertical: Approx. 800 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	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) VD reset mode	(A) Fixed shutter mode (8 steps or variable) (B) ONE trigger mode (C) Reset control mode (D) VD reset mode
	Trigger input	Camera Link (CC1) *When Reset control mode CC1 and CC2 are used		
Partial scan		Selectable start position and height of picture grabbing in 1H step.		
Power supply voltage		12 ± 1 VDC		
Current consumption		Approx. 170 mA (approx. 2.1 W)	Approx. 120 mA (approx. 1.5 W)	Approx. 120 mA (approx. 1.5 W)
Ambient temperature	Performance	0 to +40 °C (+32 to +104 °F), less than 90 % RH		
	Operation	10 to +50 °C (+14 to 122 °F), less than 90 % RH		
	Storage	-20 to +60 °C (-4 to 140 °F), less than 70 % RH (without dew condensation)		
Vibration endurance		10 to 200Hz (98 m/s <sup>2</sup> ). Sweep 10 minute, 30 minutes for each 3 axis		
Shock endurance		686 m/s <sup>2</sup> (Once for each side of top, under, left and right)		
External dimensions		29 (W) x 29 (W) x 29 (D) mm (Not including protrusions)		
Mass		Approx. 50 g		

# Digital Interface Cameras

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



**Actual Size (Approx.)**  
KP-F200Lite, KP-F80Lite, KP-F30Lite



**Actual Size (Approx.)**  
KP-FM30Lite, KP-FBM30Lite

\*KP-FBM30Lite is an integrated PoCL cable



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

# Digital Interface Cameras

<b>KP-FMR830CL</b>	Between the control unit and cameras: PoCL-Lite Composite image output from the control unit: CameraLink	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
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Output at 30fps (640 x 3840 pixels) by combining the color image of camera 8 units (VGA).

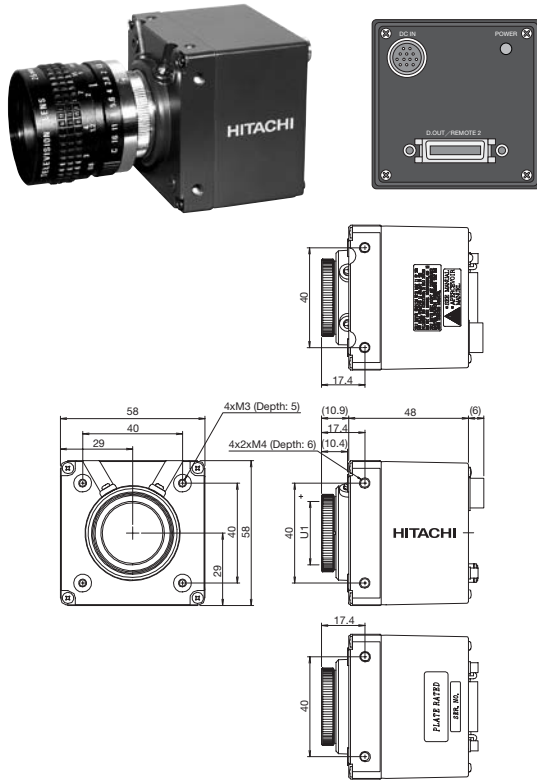




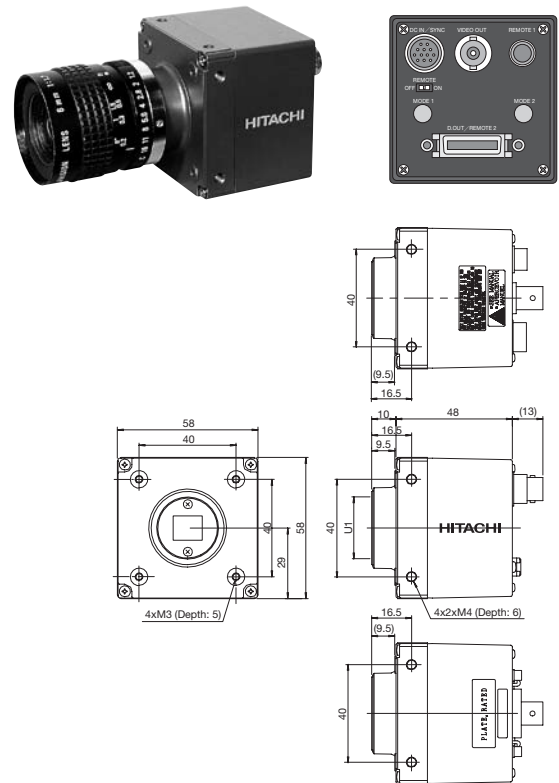
# Digital Interface Cameras

<b>KP-FD30CL</b>		1CCD Color (RGB)	1/1.8" CCD	VGA(0.33 M pixels) (659 x 494)	Max. 60 frames per sec.	58(W) x 58(H) x 48(D) mm
<b>KP-F120CL</b>	Camera Link	1CCD Black & White (Near infrared sensitivity)	2/3" CCD	SXGA(1.45 M pixels) (1392 x 1040)	Max. 30 frames per sec.	

**KP-FD30CL**



**KP-F120CL**



		<b>KP-FD30CL</b>	<b>KP-F120CL</b>
<b>Imaging device</b>		1/1.8-inch interline CCD (ICX414AQ)	2/3-inch interline CCD (ICX285AL)
	<b>Total pixels</b>	692 (H) x 504 (V)	1432 (H) x 1050 (V)
	<b>Effective pixels</b>	659(H) x 494 (V)	1392(H) x 1040 (V)
	<b>Pixel size</b>	9.9 μm (H) x 9.9 μm (V) (square lattice)	6.45 μm (H) x 6.45 μm (V) (square lattice)
	<b>Color filter</b>	RGB primary color mosaic filter	—
<b>Sensing area</b>		6.52mm (H) x 4.89 mm (V)	8.98 mm (H) x 6.71 mm (V)
<b>Aspect ratio</b>		4 : 3	
<b>Frame rate</b>		60 frames per second (full pixel readout)	30 frames per second (full pixel readout)
<b>Scanning frequency</b>		Horizontal: 31.486 kHz Vertical: 59.94 Hz	Horizontal: 32.07 kHz Vertical: 30 Hz Hz
<b>Sync system</b>		Internal/external (HD/VD auto selection)	
<b>Lens mount</b>		C mount	
<b>Flange focal distance</b>		Adjustable	17.526 mm
<b>Video output</b>		Digital output (Camera Link) 24bits (R: 8bit G: 8bit B: 8bit) (Base configuration)	Digital output (Camera Link) (Base configuration) or analog output for image checking
<b>Sensitivity</b>		2,000 lx (F5.6, 100 IRE)	400 lx (F4, 3200K)
<b>Electric shutter</b>		High speed: 11 steps, OFF(1/60), 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000 Low speed: 27 steps, OFF(1/60), 1/15, 1/10, 1/7.5, 1/6, 1/5, 1/3.75, 1/3, 1/2.5, 1/1.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.5, 7.0, 7.5, 8.0 second AES: 1/60 to approx. 1/50,000 second (Response : SLOW NORMAL FAST) VARIABLE: Approx. 1H steps from 1/60 to 1/10,000 second	1/30, 1/60, 1/125, 1/250, 1/1000, 1/2000, 1/10000, 1/50000 second. OFF is normal exposure (frame rate)
<b>Gamma</b>		γ = 1	
<b>Frame on demand</b>		(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode	(A) Fixed shutter (8 steps or variable) (B) ONE trigger mode (C) TWO trigger mode (D) Smear reduction mode (E) Partial scan mode
<b>White balance</b>		ATW / AWC / MANUAL	—
<b>Power supply voltage</b>		12 V ± 10% DC	12 ± 1 VDC
<b>Current consumption</b>		Approx. 220 mA	Approx. 400 mA
<b>Ambient</b>	<b>Operation</b>	-10°C to +50°C (+14 to +122°F), 30 to 80%RH	0 to 40°C (+32 to +104°F), less than 90 % RH
	<b>Storage</b>	-20°C to +60°C (-4 to +140°F), 20 to 90%RH	-10 to 50°C (+14 to +122°F), less than 70 % RH
<b>Vibration endurance</b>		10 to 200 Hz 68.6 m/s <sup>2</sup>	
<b>Shock endurance</b>		490 m/s <sup>2</sup>	
<b>External dimensions</b>		58 (W) x 58 (H) x 48 (D) mm (Not including mount protrusions)	
<b>Mass</b>		Approx. 220 g	

# HDTV Cameras

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

## High S/N with HD-SDI

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

## 14-bit ADC with the latest generation Hitachi DSP

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

## High resolution (DK-H100)

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

## High resolution (DK-Z50)

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

## Small & light weight head

## Versatile CCD shutter

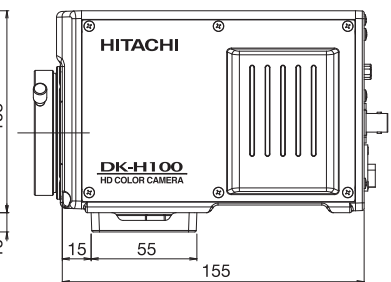
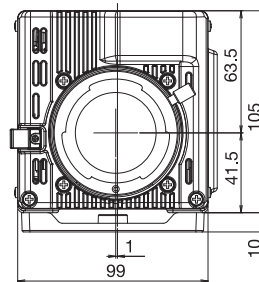
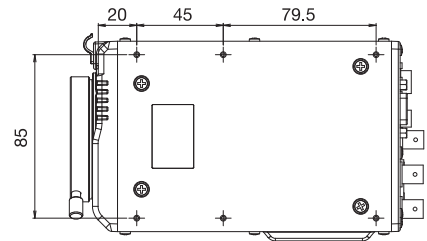
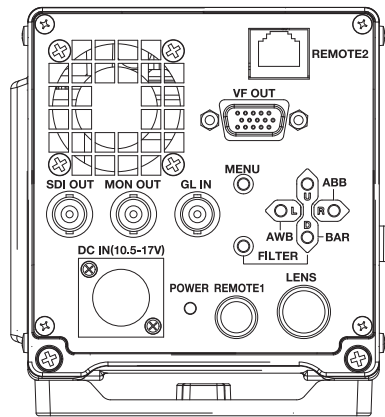
- Five preset shutter speeds
- Lock scan the camera video to image from asynchronous computer monitors, video walls or projectors without flicker
- Automatic electric shutter (AES) maintains the video level with a fixed lens f-stop

## DSP provide advanced image handling and adjustment functions

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

## Extensive user-friendly features

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



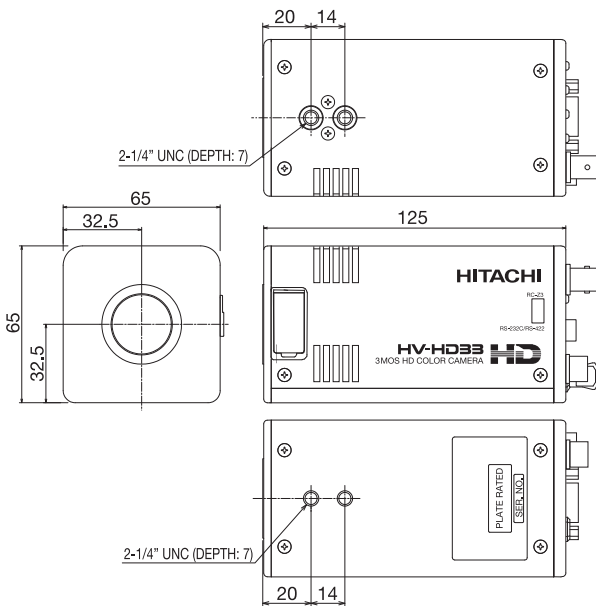
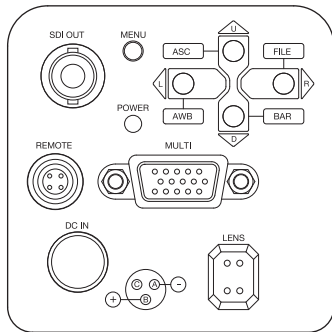
		DK-H100	DK-Z50
CCD		2/3" IT-3CCD	
Total pixels		2010(H) x 1120(V) 2.3 million pixels	1.0 million pixels
Effective pixels		1920(H) x 1080(V)	-
Aspect ratio		16:9 (HD/SD), 4:3 (SD) switchable	
TV signal format		1080/59.94i, 1080/50i, 480/59.94i, 576/50i	
Horizontal resolution		1100 TV lines	800 TV lines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

# HDTV Cameras

<b>HV-HD33</b>	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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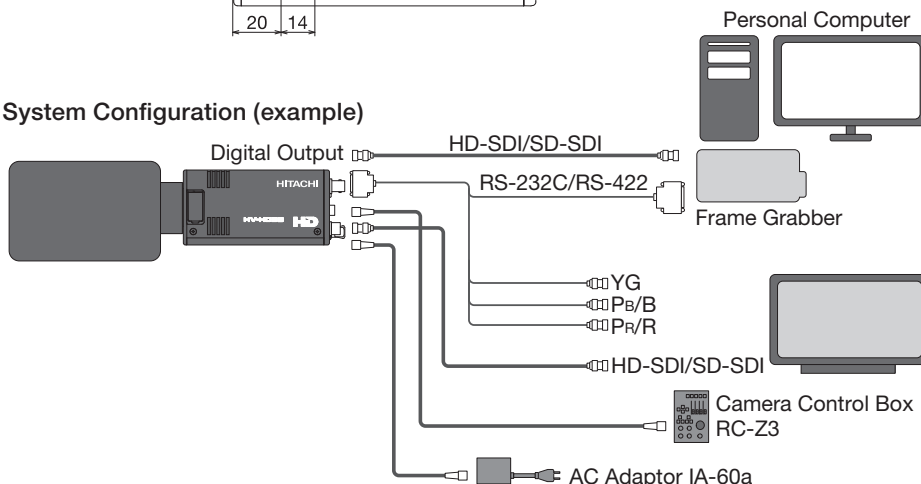
- New MOS sensors with improved sensitivity rise of 6dB.
- Multi format HDTV SDTV output  
1080 • 59.94i/50i (16:9)      720 • 59.94p/50p (16:9)  
480 • 59.94i (16:9)          576 • 50i (16:9)  
480 • 59.94i (4:3)            576 • 50i (4:3)

- Digital serial output  
HD-SDI/SD-SDI 1 output
- 6 color independent masking & Luminosity independent linear masking
- Negative positive conversion & Right and left reversing
- Camera control RS-232C/RS-422 remote controller RC-Z3



<b>Output format</b>	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)
<b>Imaging device</b>	1/3" 3MOS
<b>Total pixels</b>	1376(H) x 1070(V)
<b>Effective pixels</b>	1280(H) x 720(V)
<b>Actual image area</b>	4.80 mm (H) x 3.84 mm (V)
<b>Imaging system</b>	R. G. B. 3MOS
<b>Optical system</b>	1/3" F2.2 prism
<b>Lens mount</b>	C-mount (flange back 17.526 mm in air)
<b>Horizontal resolution</b>	720TV Line (HD-SDI output, Center of Screen, DTL: OFF, Ych)
<b>Standard sensitivity</b>	F8.0 (2000 lx, 3200K)
<b>Minimum illumination</b>	10 lx (F2.2, Gain: 15dB, Gamma: ON)
<b>S/N</b>	53dB (HD-SDI output Decode, Ych, 30MHz)
<b>Registration</b>	All screen 0.05% (Without lens Characteristic)
<b>Gain</b>	0 dB to +15 dB 1dB step
<b>Shutter</b>	Preset 1/100, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 Variable 1/60 to 1/11238 (59.94i/p mode, 1H (approx. 23ms) step) 1/50 to 1/9375 (50i/p mode, 1H (approx. 28ms) step)
<b>Gamma</b>	0.45 (ON) / 1.0 (OFF)
<b>Scene file</b>	4 Scene file
<b>Color bar</b>	ARIB bar
<b>Power supply voltage</b>	DC 12V (10.5V to 15V)
<b>Power consumption</b>	approx. 8 W
<b>Dimensions</b>	65 mm (W) x 65 mm (H) x 125 mm (D)
<b>Mass</b>	420g (except lens)
<b>Ambient temperature</b>	<b>Operating</b> -10 to 40°C <b>Storage</b> -20 to 60°C
<b>Standard composition</b>	• 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
KP-HD1005-S2					
KP-HD1005-S4					
KP-HD1005-S5					
KP-HD1001				AC type	
KP-HD20A					
KP-HD20A-S2				44(W) × 44(H) × 59(D) mm	Power over coaxial DC type

KP-HD1005 / -S2 / -S4 / -S5  
KP-HD1001



KP-HD20A / -S2



### HD-SDI output

By HD-SDI corresponding to transmission without compression as it is the expressive power of the camera, providing a Minimum Delay (17ms or less and a high-quality video).

### Coaxial cable transmission

Because that can be transmitted in the (75Ω) coaxial cable that has been used a conventional television signal in (NTSC), and the effective use of existing cable. It is capable of transmitting about 100m in the 5C-FB.

### Capable of transmitting up to 300m by the Multiunit use

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

### Multi-format support (only KP-HD20A)

1080•59.94i/50i/30p/25p

### Wide dynamic range (KP-HD1005 / KP-HD1001)

Display cleanly also large image of luminance difference.

### Adaptive noise reduction (KP-HD1005 / KP-HD1001)

Bright HDTV color images can be obtained with just 0.3 illumination—up to 64-time integration enables night time photography. 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 for the KP-HD1001)

Possible because coaxial over power supply, wiring with a single coaxial cable is possible when using Multiunit.

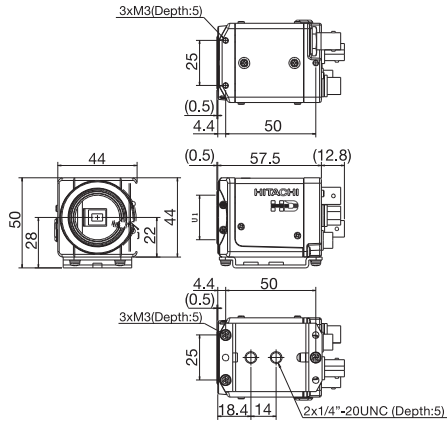
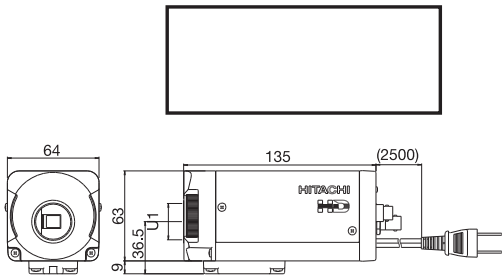
### High Sensitivity

With a high sensitivity of 0.2 lx 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 / KP-HD1001, it is capable of high-sensitivity photography of 0.02 lx in black-and-white movie. In addition, it is possible sensitivity of up to 30 times by using accumulation function in KP-HD1005 / KP-HD1001.

	KP-HD1001	KP-HD1005	KP-HD1005-S2 KP-HD1005-S4 KP-HD1005-S5	KP-HD20A KP-HD20A-S2
<b>Imaging device</b>	1/3-inch CMOS			
<b>Total pixels</b>	2010(H) × 1108(V) 2.2 M pixels			
<b>Effective pixels</b>	1944(H) × 1092(V)			
<b>Sync system</b>	Internal			
<b>Video output</b>	SMPTE 292M Compliance (HD-SDI Standard mode) HD-VLC: Require the Multiunit for transmission Analog output: VBS			
<b>Output Format</b>	HD-SDI output: 1080 30p VBS: NTSC, PAL		-	Analog output: VBS 1080 59.94i/50i/29.97p/25p KP-HD20A-S2: 1080p 59.94/50 VBS: NTSC, PAL
<b>Transmission distance</b>	HD-SDI Standard mode: Max. 100m (5C-FB 75) HD-VLC mode: Max. 300m (5C-2V 75Ω/When using the optional Multi-unit)			
<b>S/N</b>	50dB (AGC: OFF / Weight: ON)			
<b>Horizontal resolution</b>	800 TV lines			
<b>Minimum illumination</b>	Color Movie: 0.2 lx 30 times accumulation: 0.007 lx B & W Movie: 0.02 lx 30 times accumulation: 0.0007 lx (F1.2, AGC48dB, 3200K)		Color Movie: 0.2 lx (F1.2, AGC48dB, 3200K)	Color Movie: 0.2 lx (F1.2, AGC48dB, 3200K) (KP-HD20A-S2: 0.4 lx)
<b>AGC</b>	OFF/Auto (Max. 48dB) / Manual (0dB to +48dB, 1dB step)			
<b>Accumulation Mode</b>	Max. 30 times		-	-
<b>Electric shutter</b>	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)
<b>Wide dynamic range</b>	OFF/WDR WDR: Double shutter sampling		-	-
<b>Image quality adjustment</b>	Level / Gamma / Color level / Black level / Detail			
<b>Backlight correction</b>	OFF/ ON (Photometry area can be set)			
<b>Auto iris lens output</b>	DC/VIDEO			
<b>White balance</b>	Auto: ATW / AWC / Manual (2500K to 10000K)			
<b>Remote control</b>	RS-232C		-	RS-232C
<b>Lens mount</b>	C/CS C: C-mount Adaptor use			
<b>Power supply</b>	AC 100 V to		12V DC ±10%, Power over coaxial from multi-unit	
<b>Power Consumption</b>	Approx. 11W (AC 100V)		Approx. 7.5W	Approx. 4W Approx. 5.9W (KP-HD20A-S2: Approx. 4.7W)
<b>Ambient Temperature</b>	-10 to +50 °C (+14 to +122 °F), 30 to 80 % RH			
<b>Operating Storage</b>	-20 to +60 °C (-4 to +140 °F), 20 to 90 % RH			
<b>Shock endurance</b>	Less than 29.6m/S <sup>2</sup> , 10 to 55 Hz XYZ axis for each 30 minutes)			
<b>External dimensions</b>	64 × 63 × 135 mm (excluding lens and protrusions)			44 × 44 × 59 mm (excluding lene and protrusions)
<b>Mass</b>	Approx. 750 g (excluding lene)		Approx. 550 g (excluding lene)	Approx. 200 g (excluding lene)



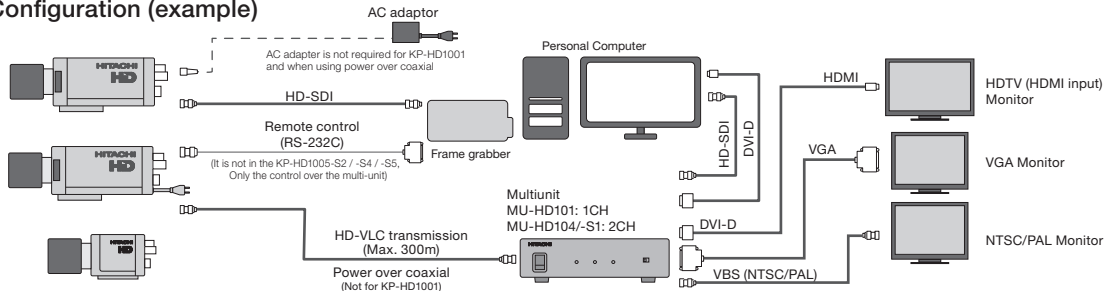
# HDTV Cameras



\*There is AC cord on the back only KP-HD1001.

Unit: mm

## System Configuration (example)



## Multiunit

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

MU-HD101



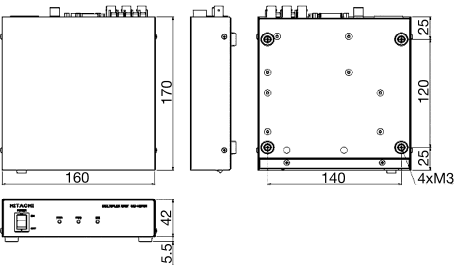
MU-HD104



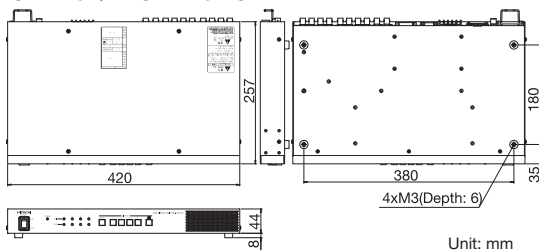
MU-HD104-S1



MU-HD101



MU-HD104 / MU-HD104-S1



Unit: mm

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

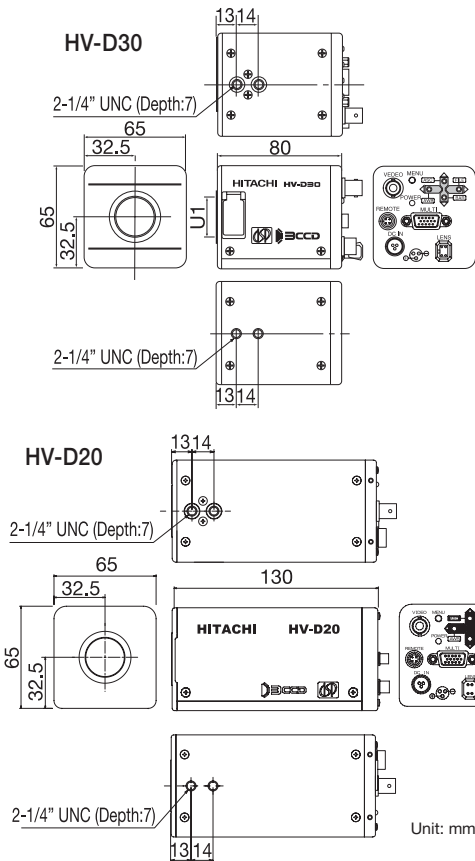
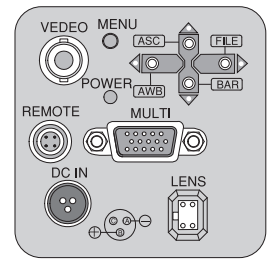
	MU-HD101	MU-HD104	MU-HD104-S1
Video input	HD-SDI 1: BNC HD-SDI (SMPTE292M) HD-VLC	HD-SDI 4: BNC	HD-VLC
Video output	HD-SDI output 1: BNC(75Ω) Through 1(MU-HD101), 4(MU-HD104): BNC(75Ω) Analog output 1: BNC(75Ω) DVI-D 1: DVI-D(SINGLE LINK) VGA 1: D-SUB15pin		HD-SDI output 1: BNC(75Ω) Through 4: BNC(75Ω)
	Full HD: 1920x1080: 59.94i/50i/29.97p/25p SXGA: 1280x1024: 60p XGA: 1024x768: 60p NTSC: 720x486: 59.94i PAL: 768x576: 50i		Full HD: 1920x1080: 29.97p
Power supply system	Power over Coaxial		
Max. transmission distance (Using KP-HD1001)	HD-SDI: 100m (5C-FB), 60m (3C-FB) HD-VLC: 300m (5C-2V), 170m (3C-2V)		
Remote control	RS-232C		-
Power supply	AC100V to 230V ±10% 13W (Power over coaxial on) 5W (Power over coaxial off)		55W (When connected to four KP-HD1005)
Operating temperature	-10 to +45°C		
External dimensions	160mm(W) × 42mm(H) × 170mm(D)		420mm(W) × 44mm(H) × 257mm(D)
Mass	Approx. 700g		Approx. 3.6 kg

# Analog Interface Cameras

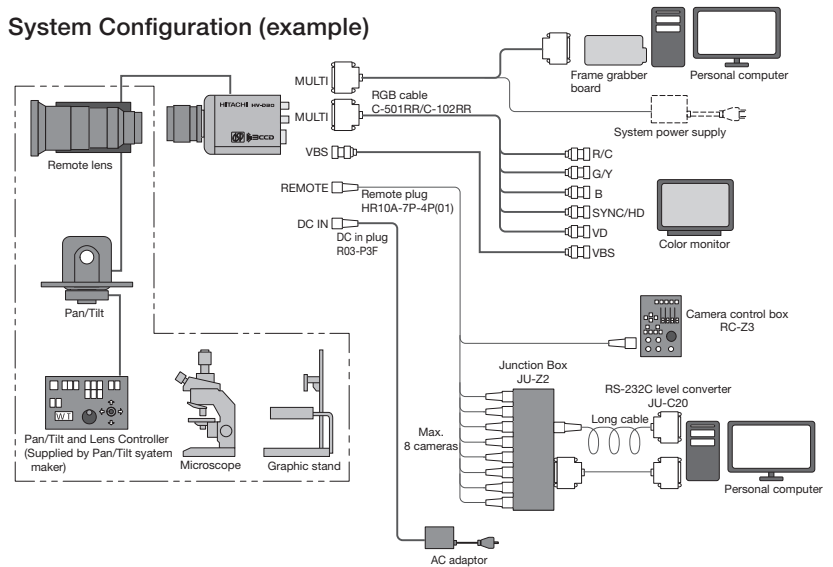
<b>HV-D30</b>	NTSC/PAL	3CCD Color	1/3" CCD	800 TV line (luminance signal center)	65(W) × 65(H) × 80(D)mm
<b>HV-D20</b>	PAL		1/2" CCD		65(W) × 65(H) × 130(D)mm

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

- Auto Shading Compensation (ASC)
- External Trigger functions



## System Configuration (example)



		HV-D30	HV-D20
<b>Color system</b>		NTSC, PAL	PAL only
<b>Optical system</b>		1/3-inch, F2.2 prism	1/2-inch, F1.6 prism
		1/3-inch interline CCD (R, G, B 3CCD)	1/2-inch interline CCD (R, G, B 3CCD)
<b>Imaging device</b>	<b>Total pixels</b>	NTSC 811(H) × 508(V) PAL : 795(H) × 596(V)	
	<b>Effective pixels</b>	NTSC 768(H) × 494(V) PAL : 752(H) × 582(V)	
<b>Sync system</b>		Internal/external (VBS, BBS or HD/VD auto selection)	
<b>Horizontal resolution</b>		800TV lines, luminance signal center (Y out and DTL off)	
<b>S/N</b>		NTSC: 64dB (DNR: ON), PAL: 62dB (DNR: ON)	
<b>Standard sensitivity</b>		2000lx, F9.5	2000lx, F11
<b>Minimum illumination</b>		0.9 lx (50IRE, F2.2, GAIN: +24dB, DIGITAL GAIN: +12dB)	
<b>Gamma correction</b>		0.45/1.0 (ON/OFF)	
<b>Lens mount</b>		C mount (flange back 17.25mm in air)	
<b>Sensitivity selection</b>		AGC (0 to +24dB) or GAIN (0 to +24dB step 1dB or step 3dB on remote control menu)	
<b>CCD drive functions</b>	<b>Preset</b>	1/100(1/60 PAL), 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/20000, 1/40000, 1/100000 second	
	<b>Lock scan</b>	NTSC 1/60.38 to 1/2039 second (step 1H), to 1/100000 second (step approx. 10% video level) PAL 1/50.31 to 1/2024 second (step 1H), to 1/100000 second (step approx. 10% video level)	
	<b>Long time integration</b>	Frame/field integration selection 1/30 (NTSC), 1/25 (PAL) to approx. 8 seconds (1 frame step)	
<b>Power supply voltage</b>		12 V rated (stable operation at 10.5 to 15 VDC (ripple and noise absent))	
<b>Power consumption</b>		Approx. 4.5W	Approx. 5.0W
<b>Dimensions</b>		65(W)×65(H)×80(D)mm	65(W)×65(H)×130(D)mm
<b>Mass</b>		400g approx. (not including lens)	450g approx. (not including lens)
<b>Ambient temperature</b>		Operating -10 to +45°C Storage -20 to +60°C	

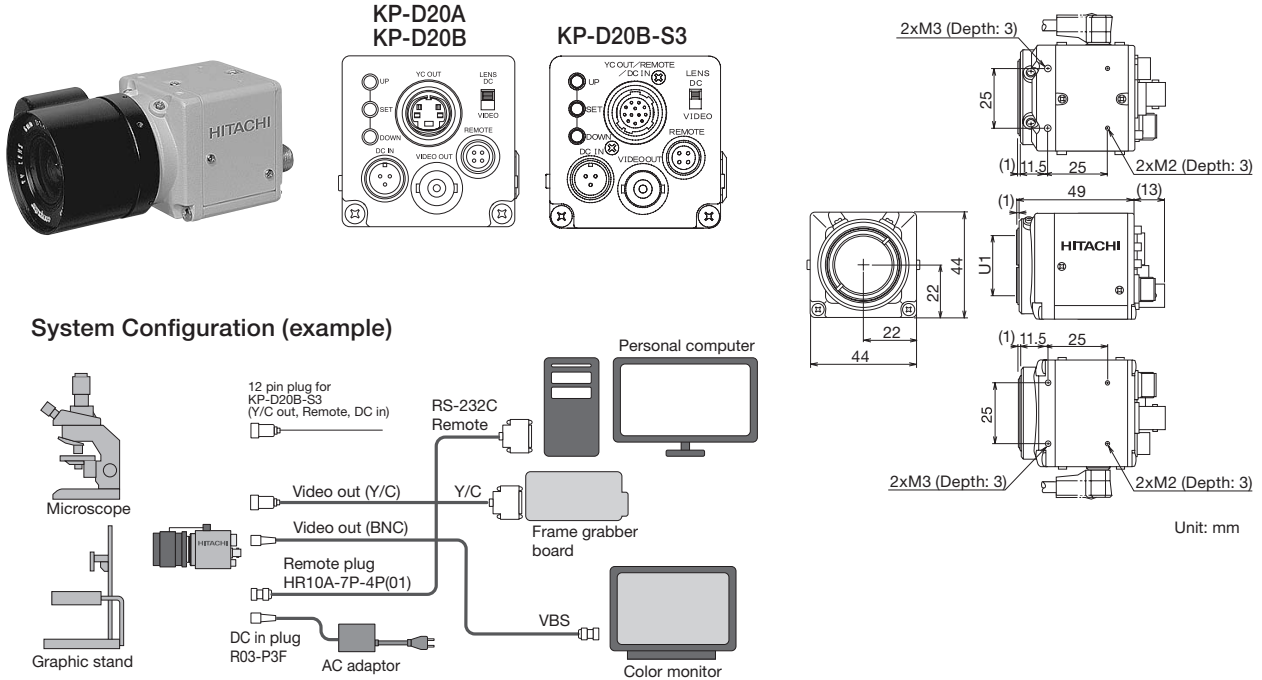
# Analog Interface Cameras

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

## 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 optimum adjustment of camera parameters to meet the imaging application.

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



		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) × 596(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: 59.94Hz PAL; Horizontal: 15.625 kHz, Vertical: 50 Hz	
Sync system		Internal	
Lens mount		C/CS-mount (C-mount adaptor optionally)	
Video output		VBS, Y/C	
Horizontal resolution		NTSC: 480TV Line, PAL: 470TV Line	
Minimum illumination		0.8 lx (F1.2, Max. gain)	0.3 lx (F1.2, Max. gain)
Signal noise to ratio		50 dB or more	
Electric shutter		OFF(NTSC:1/60,PAL:1/50),1/100(PAL:1/120),1/25 0,1/500, 1/1000,1/2000,1/4000,1/10000,1/20000,1/30000 second, AES	
White balance		ATW / AWC / MANUAL	
Digital zoom		Enlarged 4 times smoothly	
Backlight compensation		Sensing areas selectable from 9 areas	
Power supply voltage		12 VDC ±10%	
Power consumption		Approx. 220mA	
Ambient	Operation	-10 to 50°C (+14 to +122°F) , 30 to 80 % RH	
	Storage	-20 to 60°C (-4 to +140°F) , 20 to 90 % RH	
Vibration endurance		10 to 55Hz 1.96 to 59.3m/s <sup>2</sup>	
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	

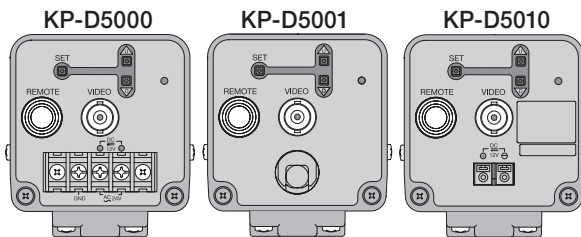
# Analog Interface Cameras

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

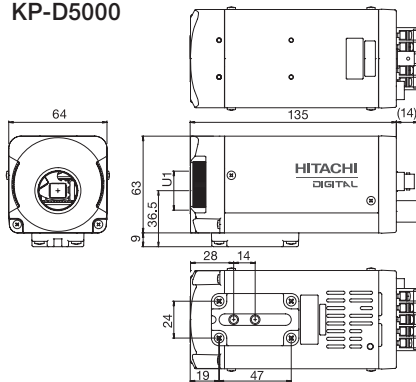
## Adaptive Fog Reduction

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

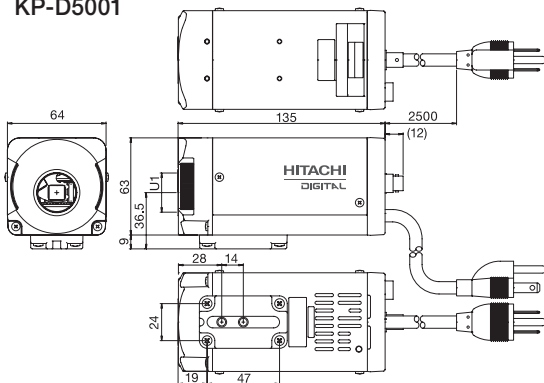
## Dial type back focus adjustment

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

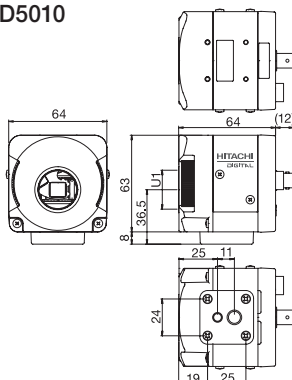
KP-D5000



KP-D5001



KP-D5010



Unit: mm

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

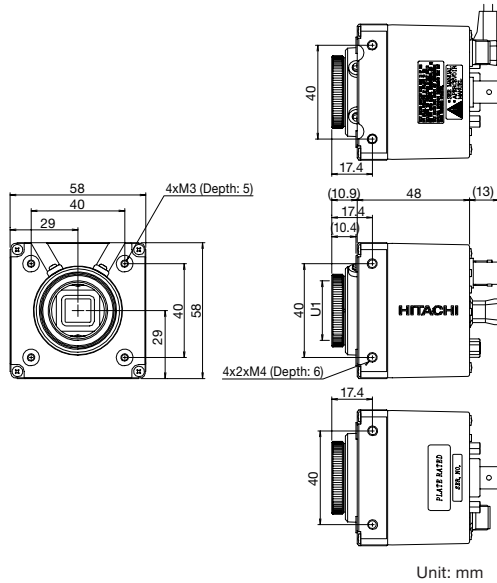


# Analog Interface Cameras

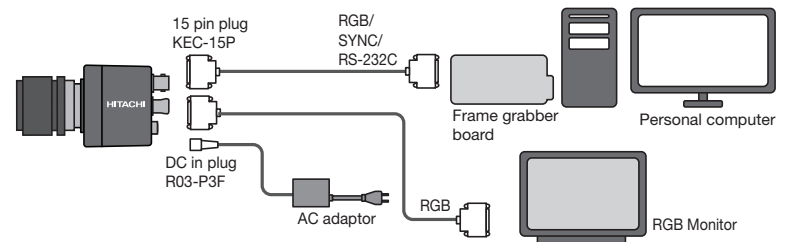
<b>KP-FD30</b>	RGB (Progressive), NTSC	1CCD Color	1/2" CCD	440 TV line	58(W) x 58(H) x 48(D)mm	
<b>KP-FD30M</b>	RGB (Progressive)					still picture continuation output



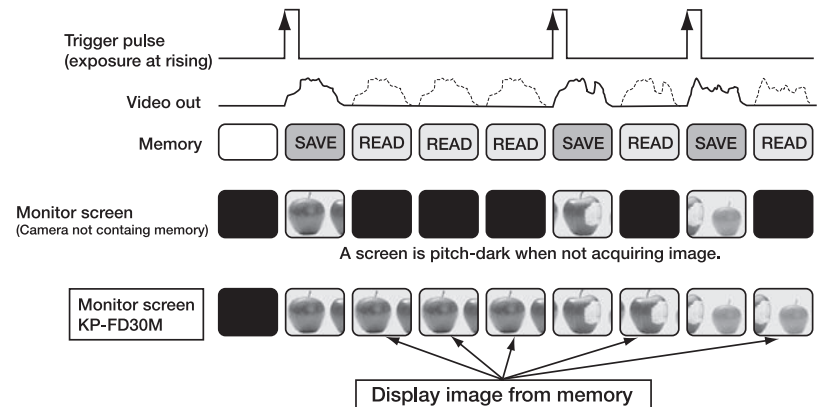
- **High resolution and high color fidelity**  
By adoption of the progressive scan CCD image sensor and RGB primary color mosaic filters, the picture of high vertical resolution and high color fidelity can be acquired.
- **Suitable for the image-processing equipment input**  
Small lightweight size,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



## System Configuration (example)



## The still picture continuation output (KP-FD30M)



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

# Analog Interface Cameras

<b>KP-F80</b>	Analog Progressive	1CCD Black & White	1/3" CCD	XGA (1034 x 779)	30 frames per sec.	29(W) x 29(H) x 38.5(D) mm
<b>KP-F33</b>				VGA (659 x 494)		
<b>KP-F30</b>					60 frames per sec.	



## Compact body

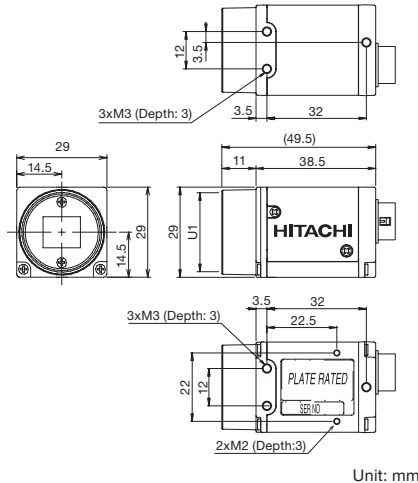
29 (W) X 29 (H) X 38.5 (D) mm

## High resolution & high frame rate

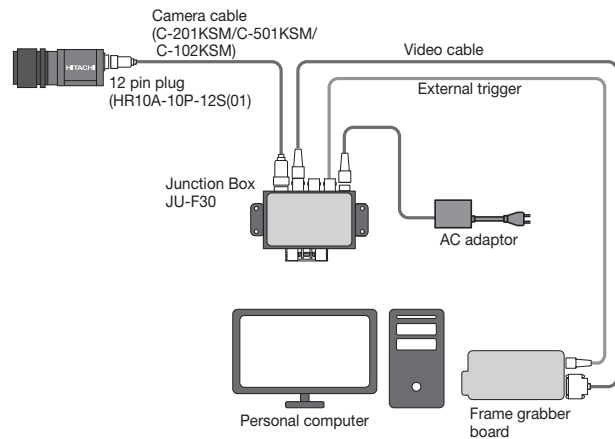
KP-F30: VGA (Effective: 659(H)x494(V)), 60 fps

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

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



## System Configuration (example)



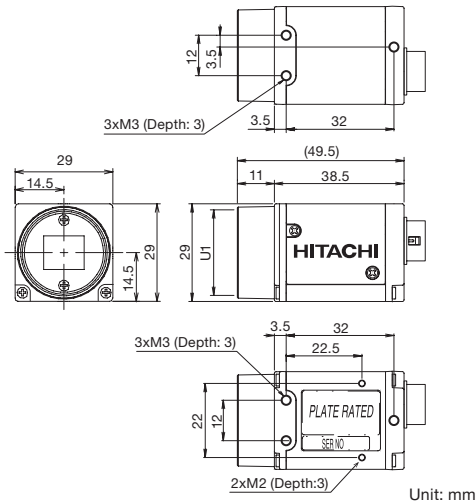
		KP-F80	KP-F33	KP-F30
Imaging device	Total pixels	1077 (H) x 788 (V)	692 (H) x 504 (V)	
	Effective pixels	1034 (H) x 779 (V)	659 (H) x 494 (V)	
	Pixel size	4.65 μm (H) x 4.65 μm (V) (square lattice)	7.4 μm (H) x 7.4 μm (V) (square lattice)	
Sensing area		4.81 mm (H) x 3.62 mm (V)		
Aspect ratio		4 : 3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

# Analog Interface Cameras

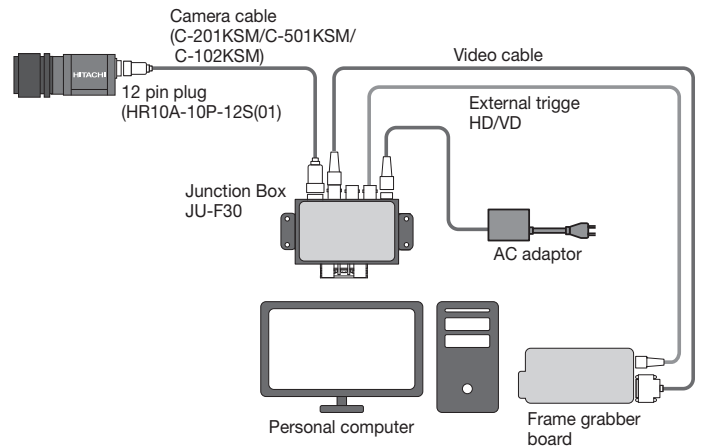
<b>KP-M20</b>	EIA (N type) or CCIR (P type)	1CCD Black & White	1/3" CCD	EIA: 570 TV line CCIR: 560 TV line	29(W) × 29(H) × 38.5(D) mm
<b>KP-M30</b>			1/2" CCD		



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



## System Configuration (example)



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

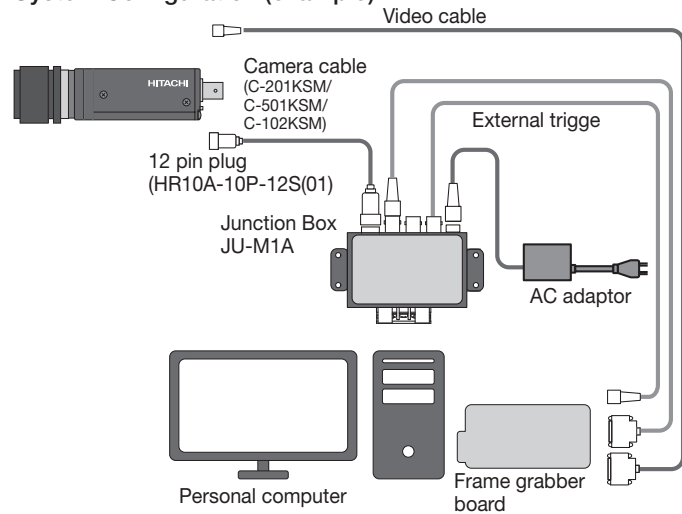
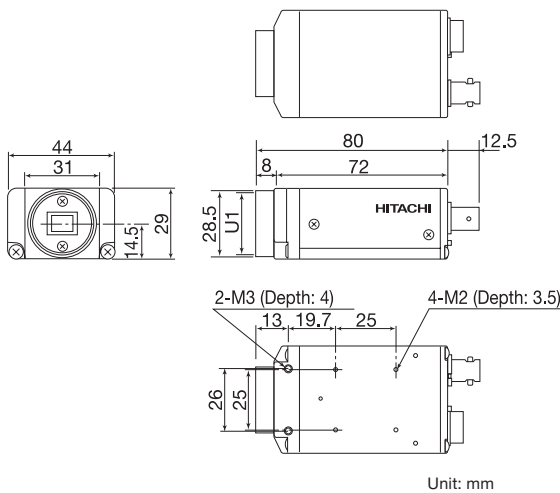
# Analog Interface Cameras

<b>KP-M1A</b>	EIA (N type) or CCIR (P type)	1CCD Black & White	2/3" CCD	EIA: 570 TV line CCIR: 580 TV line	44(W) × 29(H) × 72(D)mm
<b>KP-M2A</b>		1CCD Black & White (Near infrared sensitivity)	1/2" CCD		
<b>KP-M2R-S3</b>					
<b>KP-M3A</b>					



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

### System Configuration (example)



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



# Accessory List

Interface		CameraLink (MiniCL)																Camra Link		Camera Link															
		WCL Type				PCL Type								SCL Type				PoCL-Lite																	
Model Name		KP-FM400WCL / FM200WCL	KP-FMR400WCL / KP-FMR200WCL	KP-FD510WCL	KP-F500WCL	KP-FR500WCL	KP-F145WCL	KP-FD500PCL / FD202PCL	KP-FD140PCL	KP-F230PCL / F31PCL	KP-FR230PCL / FR31PCL	KP-F200PCL / F80PCL / KP-F30PCL	KP-FR200PCL / FR80PCL / FR30PCK	KP-FB30PCL / FBR30PCL	KP-FM200PCL / KP-FM100PCL	KP-FMD200PCL / KP-FMD100PCL	HV-F202SCL	KP-FD500SCL / FD202SCL	KP-FD140SCL	KP-F230SCL / F31SCL	KP-FR230SCL / FR31SCL	KP-F200SCL / FR80SCL / F30SCL	KP-FR200SCL / FR80SCL / FR30SCL	KP-FB30SCL / FBR30SCL	KP-F200Lite / F80Lite / F30Lite	KP-FM30Lite	KP-FBM30Lite	KP-FM1200CL	KP-FR830CL	KP-F120CL	KP-FD30CL	HV-F22CL / F22CL-S1 / F31CL / F31CL-S1			
Junction Box	JU-M1A																																		
	JU-F1																																		
	JU-Z2																																		
	JU-F30								(*)	(*)																									
C/CS-mount Adaptor		LA-D20AB																																	
Tripod Adaptor	TA-120																																		
	TA-F500																																		
	TA-F230																																		
	TA-F202																																		
	TA-F200S																																		
	TA-FM100PCL																																		
	TA-FM200																																		
	TA-FM30Lite																																		
Mini Camera Link Cable SDR-MDR (for High Frequency)	(1m) C-101SCL																																		
	(2m) C-201SCL																																		
	(3m) C-301SCL																																		
	(5m) C-501SCL																																		
	(10m) C-102SCL																																		
	(10m) C-102SCL (HF)																																		
PoCL Cable SDR-SDR	(1m) C-101PCL (SS)																																		
	(2m) C-201PCL (SS)																																		
	(3m) C-301PCL (SS)																																		
	(5m) C-501PCL (SS)																																		
	(10m) C-102PCL (SS)																																		
PoCL Cable SDR-MDR	(1m) C-101PCL (SM)																																		
	(2m) C-201PCL (SM)																																		
	(3m) C-301PCL (SM)																																		
	(5m) C-501PCL (SM)																																		
	(10m) C-102PCL (SM)																																		
Camera Link Cable	(2m) C-201CL																																		
	(3m) C-301CL																																		
	(5m) C-501CL																																		
	(10m) C-102CL																																		
Camera Cable	(2m) C-201KSM																																		
	(5m) C-501KSM																																		
	(10m) C-102KSM																																		
12 Pin Plug		HR10A-10P-12S																																	
DC Plug		R03-P3F																																	
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-FMR400WCL/FM400WCL/FMR200WCL/FM200WCL in Full Configuration mode, please use the dedicated cable for Full Configuration.

# Accessory List

Interface		USB3 Vision				GigE Vision				IEEE 1394.a	Analog				HD									
Model Name		KP-F510UB	KP-FD510UB	KP-FM200UB/F31UB/F21UB	KP-FDM200UB	KP-F510GV/F200GV/F31GV/F21GV	KP-FD510UB/FDM200GV	HV-F202GV	KP-F500GV / F202GV / F145GV / F140GV KP-F83GV / F33GV	KP-FD500GV / FD202GV / KP-FD140GV KP-KP-FD83GV / FD33GV	HV-F22GV	HV-F22F / F31F	KP-F80 / F33 / F30	KP-M30 / M20	KP-M1A / M2A / M3A / M2R-S3	KP-FD30 / FD30M	KP-D20A / D20B / D20B-S3	KP-D20B-S3	HV-D30 / HV-D20	DK-H100 / Z50	HV-HD33	KP-HD1005	KP-HD1001	KP-HD20A
Junction Box	JU-M1A																							
	JU-Z2																							
	JU-F30																							
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-120																							
	TA-D20AB																							
	TA-F230																							
	TA-F202																							
	TA-F30																							
	TA-FM30Lite																							
Camera Cable	(2m) C-201KSM																							
	(5m) C-501KSM																							
	(10m) C-102KSM																							
	(3m) C-301KAJ																							
	(10m) C-102KAJ																							
	(20m) C-202KAJ																							
RGB Cable	C-501RR																							
	C-102RR																							
15 pin Plug	KEC-15P																							
12 Pin Plug	HR10A-10P-12S																							
4pin 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																							

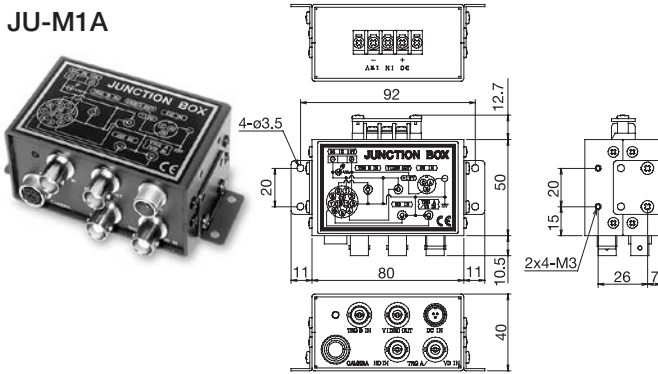
●: Standard equipment

# Accessories

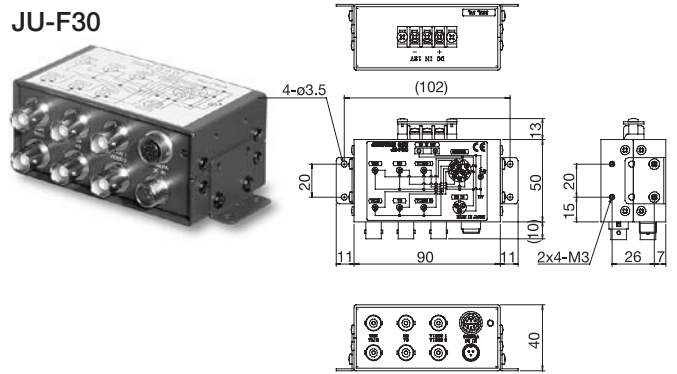
## Junction Box

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

### JU-M1A



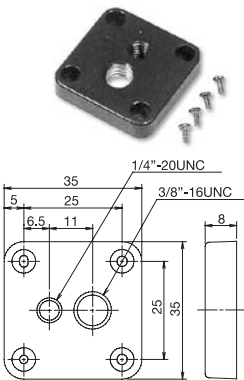
### JU-F30



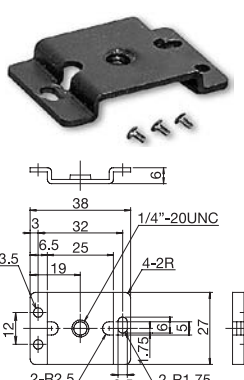
## Tripod Adaptor

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

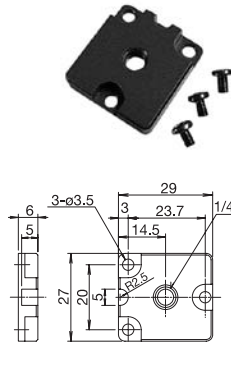
### TA-M1



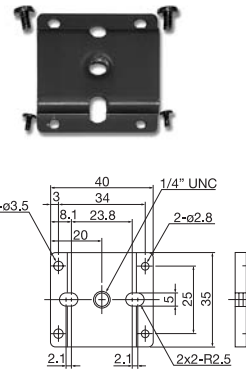
### TA-F30



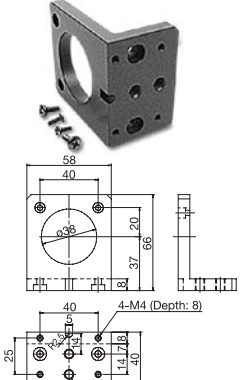
### TA-F200S



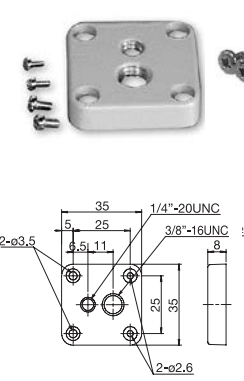
### TA-FD140



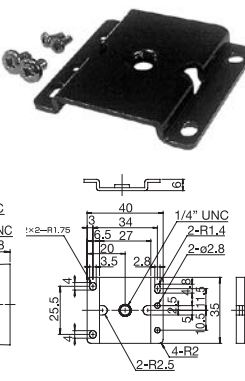
### TA-F120



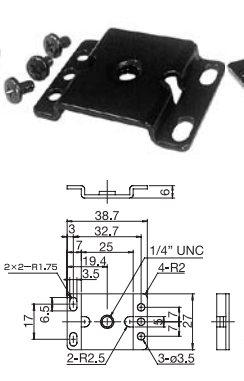
### TA-D20AB



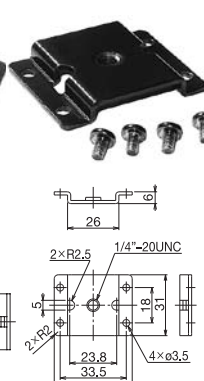
### TA-F500



### TA-F230



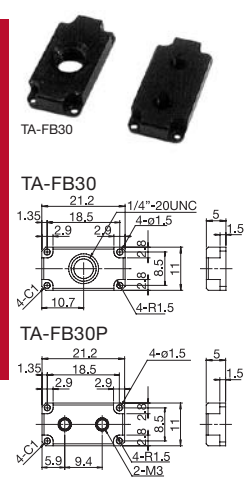
### TA-FM200



### TA-FM100PCL



### TA-FB30 / FB30P



## Camera Cable

### C-201/501/102KSM



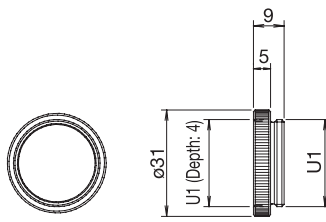
The camera cable is used for connecting camera and junction box. Supply 12VDC or external trigger signal to camera.

Molded type

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

## C/CS Adaptor

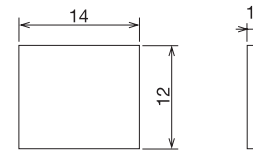
### LA-D20AB



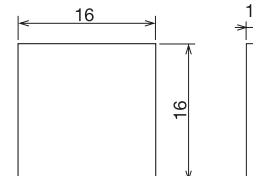
C to CS mount adapter. 5mm adapter ring used when C mount lenses are used on a CS mount camera.

## Dummy Glass

### ARC1214



### ARC1616



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

# List of Frame Grabber Board

			Mini Camera Link															
			SCL															
			3CCD			Color			B/W			RAW						
Board Maker	Model	Interface	HV-F202SCL	KP-FD600SCL	KP-FD202SCL	KP-FD140SCL	KP-F230SCL	KP-F31SCL	KP-F200SCL	KP-F80SCL	KP-F30SCL	KP-FB30SCL	KP-FR230SCL	KP-FR31SCL	KP-FR200SCL	KP-FR80SCL	KP-FR30SCL	KP-FBR30SCL
Cognex (USA)	MVS-8601	CL					○		○	※	○							
	MVS-8504	Analog																
Coreco(CANADA)/ ADSTEC/CTC	PC2-CAMLINK	CL																
	X64-CL iPro / express	CL(Base)																
	X64-Xelera-CL SE	CL(Base/Med/Full)																
	X64-Xelera-CL Dual	CL(Base/Med)																
	X64-Xelera-CL Full	CL(Base/Med/Full)																
	X64-AN	Analog																
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							○									
	DOMINO Series	Analog																
MATRIX VISION (GERMANY)	mvGAMMA-CL	CL(Base)							○									
	mvGAMMA-G	Analog (B/W)																
	mvTITAN-CL	CL(Base/Mid)							○		○							
	mvTITAN-G1	Analog (B/W)																
	mvTITAN-RGB/G4	Analog (RGB)																
	mvTITAN-C8/C16	Analog (TV)																
	mvHYPERION-CL	CL		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	mvHYPERION-CLe	CL		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	mvHYPERION-CL m/f	CL		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	mvDELTA	Analog																
mvSIGMA	Analog																	
Matrox (CANADA)	Odyssey XCL	CL																
	Odyssey Xpro	CL																
	Helios-XA	Analog																
	Helios-XCL	CL		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Helios-eCL/XCL	CL(64MZ)		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Solios XA	Analog																
	Solios XCL (6MCL/FC)	CL(66/85MHz)(Base, Mid)		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
	Solios eVCL	CL(85MZ) (Base)																
	Solios eVCL (F)	CL(85MZ) (Mid, Full)														○		
	METEOR II -MC	Analog																
METEOR II -Digital	LVDS																	
METEOR II -CL	CL														○	○	○	
National Instruments (USA)	PCI-1424	CL																
	PCI/PXI-1428	CL																
	PCI-1426	CL								○	○							
	PCle-1427	CL								○	○							
	PCle-1430	CL								○	○							
	PCle-1429	CL								○	○			○				
AVALDATA (JAPAN)	APC-3310CL	CL(Base)			○				○	○	○							
	APX-3316	CL(Full)		○	○		○									○		
	APX-3312A	CL(Base)								○	○							
	APX-3313A	CL(Full)								○	○							
	APX-3318	CL(Full)								○	○							
	APX-3311	PoCL-Lite																
GRAPHIN (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-8531CL-M	CL(Meium)		○	○	○	○											
	IPM-8531CL-F	CL(Full)		○	○	○	○		○	○			○					
	IPM-5512	CL(Base)																
	IPM-5512-PCL (PoCL)	CL(Base)																
IPM-5512-Lite	PoCL-Lite																	
IPM-5514-Lite	PoCL-Lite																	
MICRO-TECHNICA (JAPAN)	MTPCI-DC2	Analog(Color)																
	MTPCI-TL2	CL(Base)						○	○	○	○							
	MTPCI-PL-G	CL(Base)						○	○	○	○							
	MTPEX-QL-G	PoCL-Lite			○	○	○	○	○	○	○							
Linx (JAPAN)	GINGA digital-CL2	CL(Base/Mid)		○	○	○			○	○	○							
	GINGA digital-CLe	CL(Base/Mid)		○		○												
Renesas Northern Japan Semiconductor (JAPAN)	NVP-Ax100	Analog																
	NVP-Ax135P	Analog																
	NVP-Ax130CL	PoCL-Lite						※	○	※				※	※	※		
NVP-Ax135CL/137CL	PoCL-Lite						※	○	※					※	※	※		
Hitachi information & Control Solutions (JAPAN)	IP-7000BD	Analog																
	IP-7500EB	Analog																
EDEC LINSEY SYSTEM (JAPAN)	MUCap-HA2	Analog																
	MUCap-HA4	Analog																
	EDCap-CL	CL		○		○		○	○									
MUCap-HD2	CL						○	○										

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



# List of Frame Grabber Board

Board Maker	Model	Interface	PCL			WCL			PCL												
			Color			Color	B/W, RAW		B/W, RAW												
			KP-FD500PCL	KP-FD202PCL	KP-FD140PCL	KP-FMD200PCL	KP-FMD100PCL	KP-FD510WCL	KP-FM/FMR400WCL	KP-FM/FMR200WCL	KP-F/FR500WCL	KP-F145WCL	KP-FM200PCL	KP-FM100PCL	KP-F/FR230PCL	KP-F/FR31PCL	KP-F/FR200PCL	KP-F/FR80PCL	KP-F/FR30PCL	KP-FB/FR30PCL	
Cognex (USA)	MVS-8601	CL																			
	MVS-8504	Analog																			
Coreco(CANADA)/ ADSTEC/CTC	PC2-CAMLINK	CL																			
	X64-CL iPro / express	CL(Base)																			
	X64-Xelera-CL SE	CL(Base/Med/Full)																			
	X64-Xelera-CL Dual	CL(Base/Med)																			
	X64-Xelera-CL Full	CL(Base/Med/Full)																			
	X64-AN	Analog																			
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																			
	DOMINO Series	Analog																			
MATRIX VISION (GERMANY)	mvGAMMA-CL	CL(Base)																			
	mvGAMMA-G	Analog (B/W)																			
	mvTITAN-CL	CL(Base/Mid)																			
	mvTITAN-G1	Analog (B/W)																			
	mvTITAN-RGB/G4	Analog (RGB)																			
	mvTITAN-C8/C16	Analog (TV)																			
	mvHYPERION-CL	CL																			
	mvHYPERION-CLe	CL																			
	mvHYPERION-CL m/f	CL																			
		mvDELTA	Analog																		
	mvSIGMA	Analog																			
Matrox (CANADA)	Odyssey XCL	CL																			
	Odyssey Xpro	CL																			
	Helios-XA	Analog																			
	Helios-XCL	CL																			
	Helios-eCL/XCL	CL(64MZ)																			
	Solios XA	Analog																			
	Solios XCL (6MCL/FC)	CL(66/85MHz)(Base, Mid)																			
	Solios eVCL	CL(85MZ) (Base)	○	○	○																
	Solios eVCL (F)	CL(85MZ) (Mid, Full)	○	○	○																
	METEOR II -MC	Analog																			
METEOR II -Digital	LVDS																				
	METEOR II -CL	CL																			
National Instruments (USA)	PCI-1424	CL																			
	PCI/PXI-1428	CL																			
	PCI-1426	CL																			
	PCle-1427	CL																			
	PCle-1430	CL																			
	PCle-1429	CL																			
AVALDATA (JAPAN)	APC-3310CL	CL(Base)																			
	APX-3316	CL(Full)																			
	APX-3312A	CL(Base)																			
	APX-3313A	CL(Full)																			
	APX-3318	CL(Full)																			
	APX-3311	PoCL-Lite																			
GRAPHIN (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-8531CL-M	CL(Meium)																			
	IPM-8531CL-F	CL(Full)																			
	IPM-5512	CL(Base)																			
	IPM-5512-PCL (PoCL)	CL(Base)																			
	IPM-5512-Lite	PoCL-Lite																			
	IPM-5514-Lite	PoCL-Lite																			
MICRO-TECHNICA (JAPAN)	MTPCI-DC2	Analog(Color)																			
	MTPCI-TL2	CL(Base)		○	○																
	MTPCI-PL-G	CL(Base)																			
	MTPEX-QL-G	PoCL-Lite																			
Linx (JAPAN)	GINGA digital-CL2	CL(Base/Mid)																			
	GINGA digital-CLe	CL(Base/Mid)																			
Renesas Northern Japan Semiconductor (JAPAN)	NVP-Ax100	Analog																			
	NVP-Ax135P	Analog																			
	NVP-Ax130CL	PoCL-Lite																			
	NVP-Ax135CL/137CL	PoCL-Lite																			
Hitachi information & Control Solutions (JAPAN)	IP-7000BD	Analog																			
	IP-7500EB	Analog																			
EDEC LINSEY SYSTEM (JAPAN)	MUCap-HA2	Analog																			
	MUCap-HA4	Analog																			
	EDCap-CL	CL	○	○	○																
	MUCap-HD2	CL																			

# List of Frame Grabber Board

Board Maker	Model	Interface	Camera Link					PoCL-Lite					Analog						
			3CCD	Color	B/W	B/W	B/W	3CCD	Color	B/W	B/W	B/W	B/W	B/W	B/W				
Cognex (USA)	MVS-8601	CL	○																
	MVS-8504	Analog																	
Coreco(CANADA)/ ADSTEC/CTC	PC2-CAMLINK	CL																	
	X64-CL iPro / express	CL(Base)	○	○															
	X64-Xelera-CL SE	CL(Base/Med/Full)																	
	X64-Xelera-CL Dual	CL(Base/Med)																	
	X64-Xelera-CL Full	CL(Base/Med/Full)																	
Epix (USA)	X64-AN	Analog																	
	PIXCI SV5	Analog									○		○						
	PIXCI-CL1	CL																	
	PIXCI-CL2	CL																	
	PIXCI-EL1	CL																	
	PIXCI-EL1DB	CL																	
	PIXCI-EB1	CL																	
	PIXCI-EB1(PoCL)	CL																	
	PIXCI-E4	CL																	
	PIXCI-E4DB	CL																	
	Euresys (BELGIUM)	PIXCI-ECB1	CL																
PIXCI-EC1		CL																	
MATRIX VISION (GERMANY)	GrabLink	CL	○	○															
	DOMINO Series	Analog											○		○				
	mvGAMMA-CL	CL(Base)	○	○															
	mvGAMMA-G	Analog (B/W)																	
	mvTITAN-CL	CL(Base/Mid)	○	○															
	mvTITAN-G1	Analog (B/W)																	
	mvTITAN-RGB/G4	Analog (RGB)																	
	mvTITAN-C8/C16	Analog (TV)																	
	mvHYPERION-CL	CL	○	○	○														
	mvHYPERION-CLe	CL	○	○	○														
Matrox (CANADA)	mvHYPERION-CL m/f	CL	○	○	○														
	mvDELTA	Analog																	
	mvSIGMA	Analog																	
	Odyssey XCL	CL																	
	Odyssey Xpro	CL	○																
	Helios-XA	Analog																	
	Helios-XCL	CL	○	○															
	Helios-eCL/XCL	CL(64MZ)																	
	Solios XA	Analog																	
	National Instruments (USA)	Solios XCL (6MCL/FC)	CL(66/85MHz)(Base, Mid)		○														
Solios eVCL		CL(85MZ) (Base)																	
Solios eVCL (F)		CL(85MZ) (Mid, Full)																	
METEOR II -MC		Analog																	
METEOR II -Digital		LVDS	○	○	○														
METEOR II -CL		CL																	
PCI-1424		CL	○																
PCI/PXI-1428		CL	○																
PCI-1426		CL	○																
AVALDATA (JAPAN)		PCle-1427	CL	○															
	PCle-1430	CL	○																
	PCle-1429	CL	○																
	APC-3310CL	CL(Base)	○	○															
	APX-3316	CL(Full)	○		○														
	APX-3312A	CL(Base)	○	○															
GRAPHIN (JAPAN)	APX-3313A	CL(Full)	○	○															
	APX-3318	CL(Full)	○	○															
	APX-3311	PoCL-Lite																	
	IPM-8580CL-M	CL(Medium)	○	○	○														
	IPM-8580CL-F	CL(Full)	○	○	○														
	IPM-8580CL-M(PoCL)	CL(Medium)																	
	IPM-8531CL-BE	CL(Base)	○	○	○														
	IPM-8531CL-BE(PoCL)	CL(Base)																	
	IPM-8531CL-M	CL(Meium)	○	○	○														
	IPM-8531CL-F	CL(Full)	○	○	○														
MICRO-TECHNICA (JAPAN)	IPM-5512	CL(Base)																	
	IPM-5512-PCL (PoCL)	CL(Base)																	
	IPM-5512-Lite	PoCL-Lite																	
	IPM-5514-Lite	PoCL-Lite																	
Linx (JAPAN)	MTPCI-DC2	Analog(Color)																	
	MTPCI-TL2	CL(Base)	○	○	○														
	MTPCI-PL-G	CL(Base)	○	○	○														
Renesas Northern Japan Semiconductor (JAPAN)	MTPEX-QL-G	PoCL-Lite	○	○	○														
	GINGA digital-CL2	CL(Base/Mid)	○	○	○														
Hitachi information & Control Solutions (JAPAN)	GINGA digital-CLe	CL(Base/Mid)																	
	NVP-Ax100	Analog																	
EDEC LINSEY SYSTEM (JAPAN)	NVP-Ax135P	Analog																	
	NVP-Ax130CL	PoCL-Lite																	
	NVP-Ax135CL/137CL	PoCL-Lite																	
MUCap-HA2	IP-7000BD	Analog																	
	IP-7500EB	Analog																	
MUCap-HA4	MUCap-HA2	Analog																	
	EDCap-CL	CL																	
MUCap-HD2	MUCap-HA4	Analog																	
	MUCap-CL	CL																	
MUCap-HD2	MUCap-HD2	CL																	

# List of Frame Grabber Board (Box type)

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

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

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

# List of Optional Lens

## KOWA

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



### Technical Information

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

## μ•TRON

	Supports 3CCD Zoom	Supports megapixels Zoom	Supports 5 megapixels	Supports 2 megapixels
Model	PH16x8B	PH33x30	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	80x85mm	122x122mm	ø47.5 to 57mm	ø32.5 to 36mm
Mount	C	C	C	C



### Technical Information

- Myutron Inc. URL : [http://www.myutron.com/index\\_e.html](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](http://www.fujinon.com) TEL : 0 21 54/9 24-0 FAX : 0 21 54/9 24-2 90 Mail : fujinon@fujinon.de
- EUROPE URL : [www.fujinon.de](http://www.fujinon.de) TEL : +33 (0) 1/39 30 16 16 FAX : +33 (0) 1/30 43 77 21 Mail : fujinon@fujinon.fr

## TAMRON

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



23FM16SP



23FM25SP



23FM50SP

### Technical Information

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

## Tokina

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



KCM-0914MP5



KCM-10D-64



KCM-50NII

### Technical Information

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

# List of Optional Lens

## SPACECOM

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



TAV2812DCIR-MP



VZ2465RI R-MP



PYXIS8



PYXIS12



PYXIS16



PYXIS25



PYXIS35

### Technical Information

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

## CBC

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



M0814-MP



M1214-MP



MLM-3XMP

### Technical Information

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

## 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](http://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	SXGA	UXGA	2M Pixel	4M pixels	5M Pixels	12M Pixels
Flame late	280 fps					● KP-FM200WCL ● KP-FMR200WCL			
	150 fps						● KP-FM400WCL ● KP-FMR400WCL		
	125 fps	● KP-F31UB ● KP-F21UB ● KP-F31GV ● KP-F21GV							
	120 fps	● KP-F31PCL/SCL ● KP-FR31PCL/SCL							
	90 fps	● KP-FM30Lite ● KP-FBM30Lite ● KP-F33GV ● ● ● KP-FD33GV							
	61 fps			● KP-FM100PCL					
	60 fps	● KP-F30PCL/SCL ● KP-FR30PCL/SCL ● KP-FB30PCL/SCL ● KP-FBR30PCL/SCL ● KP-F30Lite ● KP-FD30CL							
	53 fps				● KP-FM200PCL ● KP-FM200UB ● ● ● KP-FMD200UB ● KP-FM200GV				● KP-FM1200CL
	36 fps		● KP-F80PCL/SCL ● KP-FR80PCL/SCL ● KP-F80Lite ● KP-F83GV ● ● ● KP-FD83GV						
	30fps	■ HV-F31CL		● KP-F1450WCL ● KP-FD140PCL/ SCL ● KP-FMD100PCL ● KP-F120CL ● KP-F145GV ● KP-F140GV ● ● ● KP-FD140GV	● KP-F230PCL/SCL ● KP-FR230PCL/SCL ● ● ● KP-FD202PCL/SCL ● ● ● KP-FMD200GV ● KP-F202GV ● ● ● KP-FD202GV ■ HV-F202SCL				
	28fps					■ HV-F202GV			
	26fps					● KP-FMD200PCL			
	18fps								● KP-F510UB ● KP-F510GV ● KP-F500WCL ● KP-FR500WCL ● KP-F500GV
	15fps	■ HV-F31F	■ HV-F22CL ■ HV-F22GV		● KP-F200PCL/SCL ● KP-FR200PCL/SCL ● KP-F200Lite				
	12fps								● KP-FD510WCL ● KP-FD500PCL ● KP-FD500SCL ● ● ● KP-FD510UB ● ● ● KP-FD510GV ● ● ● KP-FD500GV
9fps									
7.5fps		■ HV-F22F							

■ : 3CCD Color (RGB)  
 ■ : 3CCDColor (YUV)  
 ● : Color (RGB)  
 ● : Color (YUV)  
 ● : Color (RAW)  
 ● : Black & White

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  
 CL: Camera Link  
 F: EEE1394.a

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

## Hitachi Kokusai Electric Inc.

These Specifications are subject to change without notice.

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