

# USB3.0 Progressive scan CMOS camera KP-FM200UB Specifications

## 1. General

The KP-FM200UB is single CMOS type camera which utilized the progressive scan CMOS image sensor with square pixel for UXGA format of 1/1.8-inch.

By adoption of USB3.0 interface, high-speed transmission is possible.

The frame rate is up to 53 frames per second at the image of 1600 (H) × 1200 (V).

In addition, since the square pixel CMOS is adopted, the suitable images can be obtained for image processing.

## 2. Outstanding features

### (1) USB3.0 Vision compatible

Based on Industrial camera interface standard USB3.0 Vision which is made by AIA (Automated Image Association).

### (2) GenICam compatible

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

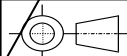
### (3) Ultra small body

29 (W) × 29 (H) × 20 (D) mm.

### (4) Variety of CMOS drive function

- Multi-step electronic shutter (9 settings : 1/60 to 1/50000 seconds)
- Variable electronic shutter (Variable from 10 μ to 100000 μ seconds)
- Controllable the exposure timing by an external trigger signal / software trigger via USB cable


-	Sep.24,2014	(first edition)	K.Ueno	K.Ueno
SYMBOL	DATE	DESCRIPTION	(DRAWN)	DESIGNED

MODEL KP-FM200UB		TOLERANCE	Prod. Code - Order No.	
DESIGNED	DATE	APPROVED	DATE	TITLE <b>KP-FM200UB Specifications</b>
CHECKED	DATE	STORED	DATE	
UNIT SCALE				
<b>Hitachi Kokusai Electric</b>			DWG. No. <b>E400457933</b>	REV. <b>0</b>
				SHEET 1 / 11

### 3. Specifications

A	(1) Imaging device	1/1.8-inch progressive scan interline CMOS
	Effective pixels	1600 (H) x 1200(V)
	Pixel size	4.5um (H) x 4.5 um (V) (square lattice)
	(2) Scanning area	7.2 mm (H) x 5.4 mm (V)
	(3) Scanning system	Progressive
	(4) Frame rate	53 frames per second (full pixel readout)
	(5) Horizontal drive freq.	114MHz
B	(6) Horizontal scan freq.	64.773kHz
	(7) Vertical scan freq.	53.180Hz
	(8) Sync system	Internal
	(9) Lens mount	C mount
	(10) Flange focal distance	17.526 mm
	(11) Video output	
	Interface	USB3.0
	Image format	Mono 8/10/12bit
C	Maximum image size	1600 (H) x 1200 (V)
	Frame rate	53 frames per second
	(12) Sensitivity	500lx, F5.6, 3200K
	(13) Signal to noise ratio	45dB
	(14) Electric shutter	OFF / Auto (AES) / Manual (PRESET or VARIABLE)
		OFF is normal exposure (frame rate)
D	PRESET	1/60, 1/100, 1/200, 1/500, 1/1000, 1/2000, 1/4000, 1/10000, 1/50000 second
	VARIABLE	minimum 10 $\mu$ second
	(15) External trigger shutter	
	Mode	Fixed shutter mode (9 preset time / variable)
	Input	Via USB3.0 cable (Software trigger) 6-pin connector (Hardware trigger)
	Input level	(TTL) HIGH : 5V +/- 1V, LOW : 0 to 0.03V
E	Threshold	3.7V +/- 0.5V (Low --> High) 3.3V +/- 0.5V (High --> Low)
	Input polarity	High / Low switchable
	Input delay	Adjustable

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(16) External sync signal

Strobe out 5Vp-p +/- 0.3V

Output polarity High / Low switchable

(17) Partial scan Selectable start position and width of picture grabbing  
in 1pixel step for Horizontal & Vertical.

(18) Binning mode OFF/ON (Vertical)

(19) ALC (Auto Light Control) Video level can be adjustable

(20) Gain Adjustable from 0 to 18dB at 0.1dB step

(21) Gamma OFF ( $\gamma = 1$ ) / LUT (0.45 to 1)

(22) Sharpness Adjustable

(23) Black level Adjustable

(24) Knee Adjustable (Knee point and Knee slope)

(25) Power supply voltage DC+5V +/- 5% (via USB3.0 connector)

(26) Power consumption Approx. 320mA (1.6W)

(27) Ambient

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)

(28) Vibration endurance 98 m/s<sup>2</sup> or less (10 to 200Hz, 10 minutes each on XYZ axes)  
(Do not subject to strong vibration for long periods of time.)(29) Shock endurance 490.3 m/s<sup>2</sup> or less (on XYZ axes)

(30) External dimensions 29(W) x 29(H) x 20(D) mm (not including lens and protrusions)

(31) Mass Approx. 45g

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#### 4. Composition

(1) Camera (with Dummy glass)

(2) Composition sheet, Warranty card

Operation manual, SDK, control software can be downloaded on the website.

[http://www.hitachi-kokusai.co.jp/products/tv/fa-camera/down\\_load/index.html](http://www.hitachi-kokusai.co.jp/products/tv/fa-camera/down_load/index.html)

#### 5. Optional accessories

(1) Dummy glass (AR coated)

ARC1214

(2) IR cut filter

IRC650

(3) Junction Box

JU-F30

(4) USB3.0 cable

Commercial item

## 6. Specification of Digital output connector

### (1) USB3.0 connector

PIN NO.	SIGNAL
1	VBUS
2	D-
3	D+
4	N.U.
5	GND
6	SSTX-
7	SSTX+
8	GND_DRAN
9	SSRX-
10	SSRX+

Connector : USB Connector (Micro-USB(3.0))

N.U. : Not used

### (2) 6-pin connector

PIN NO.	SIGNAL
1	N.U.
2	TRIG-A
3	N.U.
4	FLASH / VD OUT
5	GND
6	GND

N.U. : Not used

Connector (camera side) : Hirose HR10A-7R-6PB(74) or equivalent

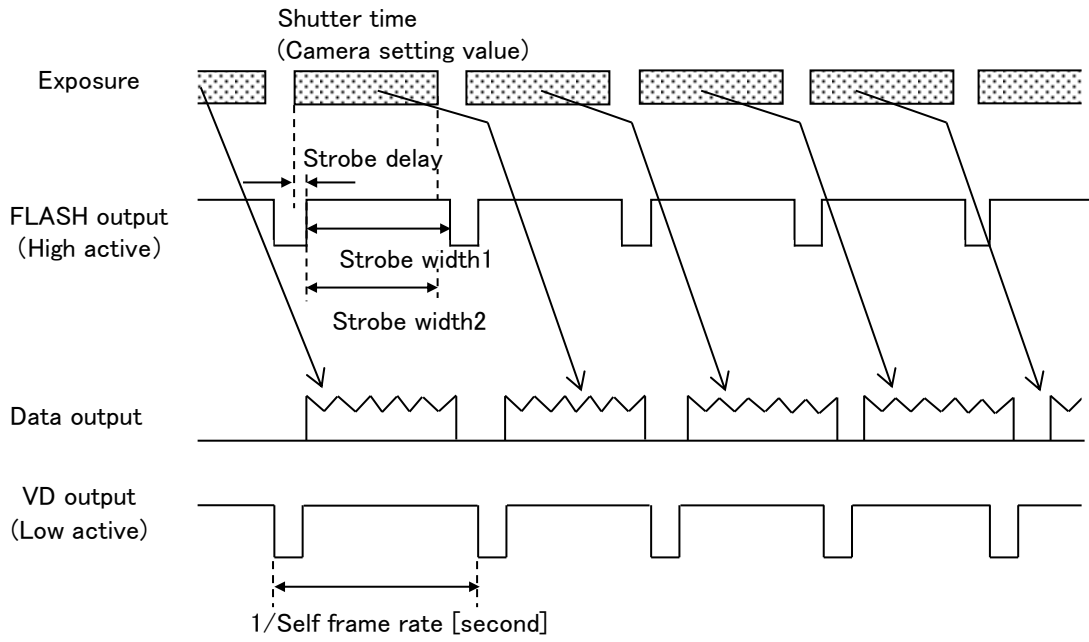
Plug (Cable side plug) : Hirose HR10A-7P-6S(74) or equivalent

Install clamp filters (ZCAT 2035-0930A: TDK) at both ends (camera and video processor ends) in the CE marking legion.

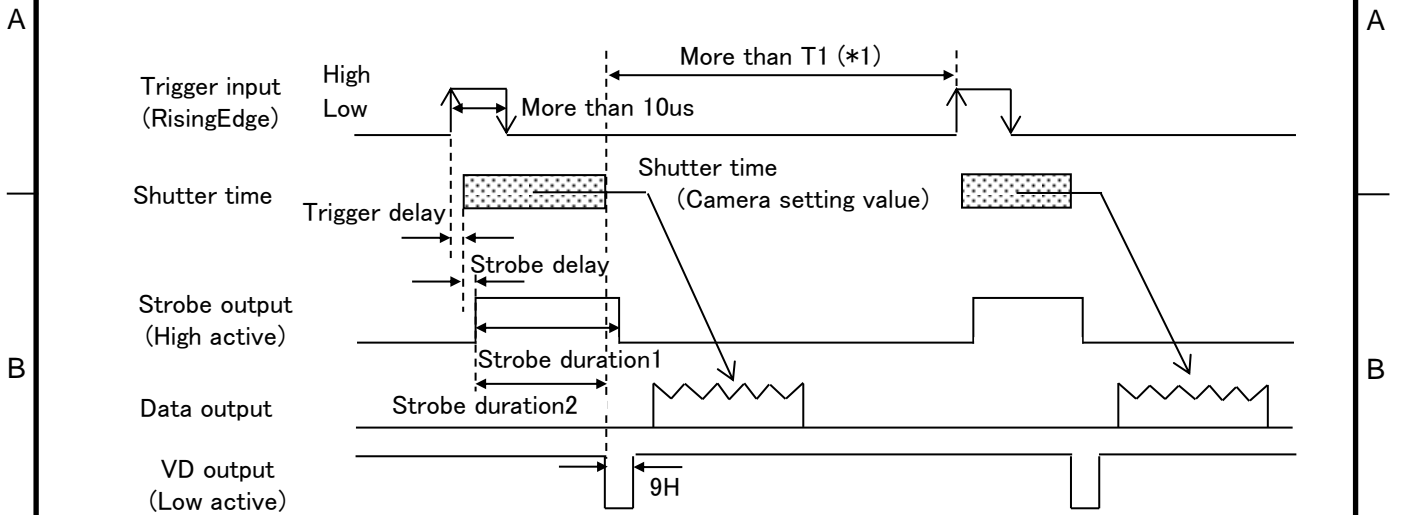
Note: Please do not input any signal to N.U. pin because machine may break down.

7. Timing chart

7-1. Normal mode



7-2. Fixed shutter mode



(\*1)  $T1 = 1 / \text{Self frame rate [second]}$

## 8. Input/Output signal

### (1) Input signal

The level of the trigger signal input to the camera is as follows.

High level : +5.0V +/- 1V

Low level : 0 to +0.3V

Threshold : 3.7V +/- 0.5V (Low --> High)

3.3V +/- 0.5V (High --> Low)

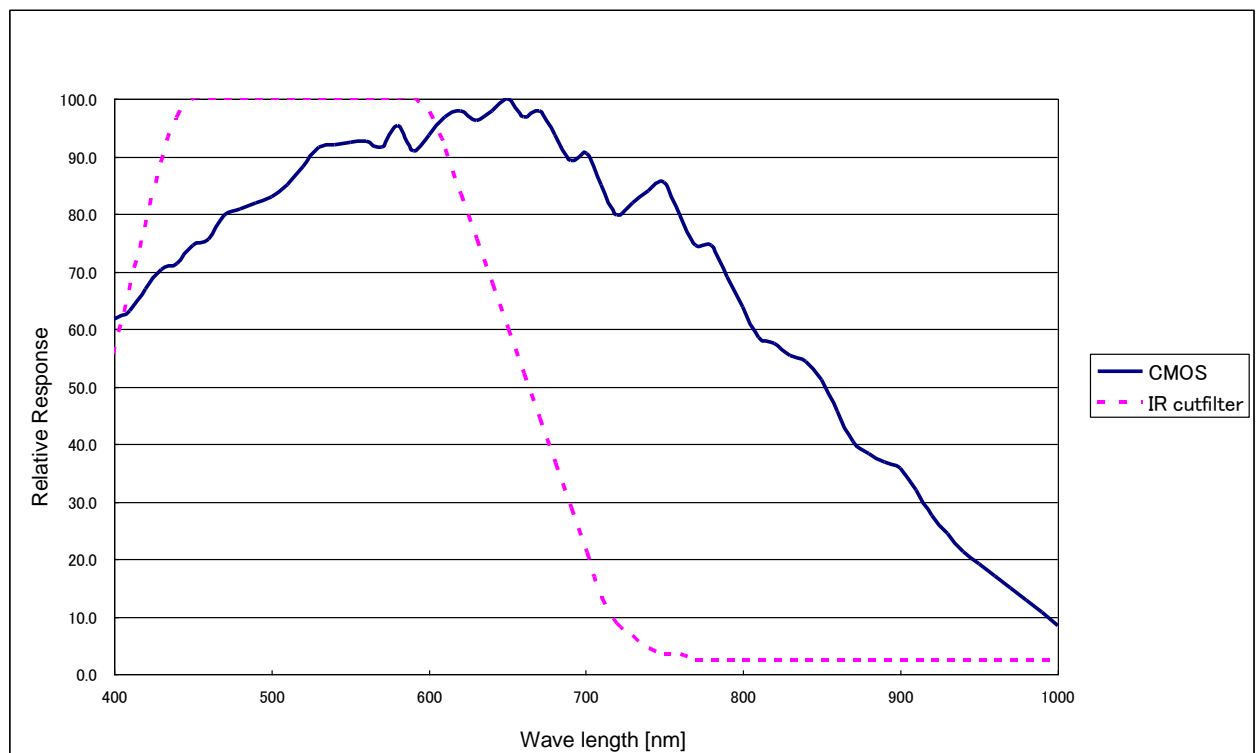
### (2) Output signal

The level of the VD / FLASH signal output from the camera is as follows.

High level : 5Vp-p +/- 0.3V

Low level : 0 to +0.3V

## 9. Spectral response





10. External view

A

B

C

D

E

F

A

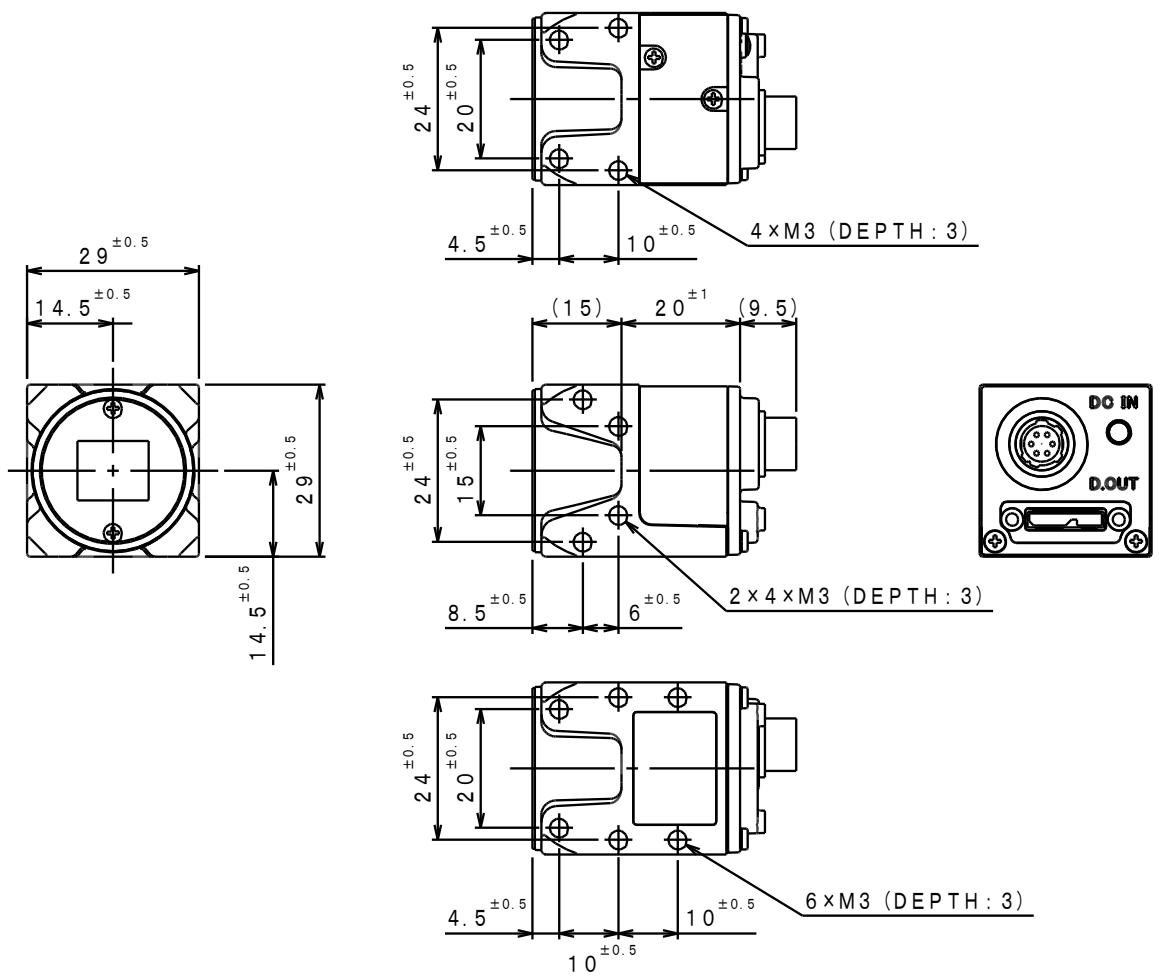
B

C

D

E

F



**Notice:**

These specifications are subject to change without prior notice due to product improvement.

Confirm the most recent specifications at time of order.

Hitachi Kokusai certifies this product complies with the standard warranty conditions of Hitachi Kokusai, and that quality control is implemented to the extent required to comply with these conditions.

**RoHS Compliant**

This product complies with the requirement of the RoHS(Restriction of the use of Certain Hazardous Substances in Electrical and Electronic Equipment) Directive 2002/95/EC

**Warranty and service:**

- (1) The guarantee period is one year after the date purchase.  
However, the defects due to erroneous use or intentional act are excluded.
- (2) As the defect after expiration of the guarantee period, where product repair is possible, repair will be performed at charge.
- (3) The present Warranty pertains only to the camera unit. Secondary malfunctions attributable to camera failure as well as expenses incurred by disassembly and reassembly of the related system, are beyond the scope of this Warranty.
- (4) Compensation for loss of business, loss or damage to software, database and other contingent losses are beyond the scope of this Warranty.
- (5) Hitachi Kokusai Electric Inc. is not liable for the losses caused when the equipment is used in a system, use for business trades, production process, medical fields, crime prevention applications, etc.
- (6) In the case of camera trouble by miss wiring of cable, it will be considered as out of warranty.

