

Black and White Camera

**KP-M1A**

### **OPERATION MANUAL**

Please read this operation manual carefully for proper operation, and keep it for future reference.

**Hitachi Kokusai Electric Inc.**

CCD カメラ

**KP-M1A**

### **取取扱説明書**

この取取扱説明書には、あなたや他の人々への危害や財産への損害を未然に防ぎ、この機器を安全にお使いいただくために、守っていただきたい事項を示しています。ご使用になる前に、取取扱説明書をよくお読みいただき、正しい使い方でご愛用ください。  
お読みになった後も、この機器のそばなどいつも手元に置いてご使用ください。

**株式会社 日立国際電気**

## KP-M1A for U. S. A.

These products have been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. These equipments generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of these products in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### WARNING

Changes or modifications not expressly approved by Hitachi Denshi responsible for compliance could void the user's authority to operate the equipment.

## KP-M1A for Canada

These products do not exceed the class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations.

Le présent appareil n'émet pas de bruits radioélectriques dépassant les limites applicable aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministère des communications du Canada.

## KP-M1A P

### Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß CCD-Kamera KP-M1AP in Übereinstimmung mit den Bestimmungen der Amtsblattverfügung Nr. 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Hitachi Denshi(Europa) GmbH

Weiskircher Straße 88, D-6054 Rodgau 1 (Jügesheim)

F. R. Germany

**Note:** The model and serial numbers of your CAMERA are important for you to keep for your convenience and protection. These numbers appear on the nameplate located on the bottom of the products. Please record these numbers in the spaces provided below, and retain this manual for future reference.

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

## Declaration of Conformity

**Manufacturer's Name:** Hitachi Kokusai Electric, Inc.  
**Manufacturer's Address:** 1,Kanda-Irumi-cho, Chiyoda-ku,  
 Tokyo 101-0024, Japan

**Representative(s) Address in the EU:** Hitachi Denahi (Europa) GmbH  
 Weiskircher StraÙe 88,  
 Jügesheim D-63110 Rodgau, Germany

Hitachi Denahi (U.K.) Ltd.  
 14 Garrick Industrial Centre,  
 Irving Way, Hendon, London,  
 NW9 6AQ, United Kingdom

declares, that the product:

**Product Name:** CCD Camera  
**Model Number(s):** KP-M1AP  
 KP-M1AN

conforms to the following Standards:

**EMC:** EN 50061-1:1992  
 EN 50082-1:1997

**Supplementary Information:**

"The product complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC."

**Signature:**



Y. Iwasaki  
 Dept. Manager, Quality Assurance  
 Broadcast & Telecommunication  
 Systems Group  
 Hitachi Kokusai Electric, Inc.



K. Osada  
 Managing Director  
 Hitachi Denahi (Europa) GmbH  
 Hitachi Denahi (U.K.) Ltd.

Date: 29<sup>th</sup> November, 2000

## Phenomena inherent to CCD imaging device

Following are the phenomena inherent to a CCD imaging device, and not defects

### 1) Smear and blooming

When strong light (lamp, fluorescent lamp, reflected light, etc.) is shot, pale bands are displayed vertically above and below the light.

In this case, change the angle of the camera so that such strong light does not enter the camera through the lens.



### 2) Fixed pattern noise

When the camera is operated in a high temperature, fixed pattern noise may appear on the entire screen.

### 3) Moire

When fine patterns are shot, moire may be displayed.

# NOTES TO USERS

## **a. Power supply**

Connect 12V $\sqrt{}$ 1V DC from an external power supply.

## **b. To protect CCD (sensor)**

- Do not touch the glass surface of the sensor to avoid dirt and scratches.
- If the glass surface of the sensor should become dusty or dirty, wipe off dust or dirt carefully with a cotton-tipped applicator. Never use dry cloth or paper. The surface may be scratched and further the sensor may be damaged by static electricity.
- Be sure to mount a lens or the supplied mount cap on the camera to protect the sensor from dust.

## **c. To protect camera**

- Do not use or store the camera under direct sunlight, in environments exposed to rain, or snow, or at a place exposed to flammable or corrosive gas.
- The camera operates in the temperature range between -10 and 50C.

If the camera is used or left at a high temperature (40°C or more) for hours, the life of the camera may be shortened. When using the camera continuously for hours, avoid using the camera in such

- Do not drop the camera. Do not apply strong shock or vibration to the camera.
- Before connecting or disconnecting a connector, turn off the camera. Be sure to hold the connector body to connect or disconnect the connector.

## **d. Arrangement of camera**

When several cameras are installed very close with each other, the cameras may interfere with each other to cause noise. Install the cameras as far as possible from each other or operate the cameras by an external sync signal.

## **e. Fixing of camera**

When a heavy lens is used, or when excessive shock or vibration is applied, fix the lens to the equipment, too.

## GENERAL

The KP-M1A are compact, lightweight, black and white cameras. The KP-M1A uses the latest high grade 2/3-inch image size. The total pixel number of each CCD is 410,000 (490,000 for CCIR). KP-M1AN : EIA, KP-M1AP : CCIR

## MAJOR FEATURES

- Compact: 44(W) × 29(H) × 72(D)mm  
Lightweight: 120g approx.
- Variable speed electronic shutter function
- Internal/external synchronization, interlaced/non-interlaced operation
- Field-on-Demand function
- Frame and field integration modes switchable

## COMPOSITION

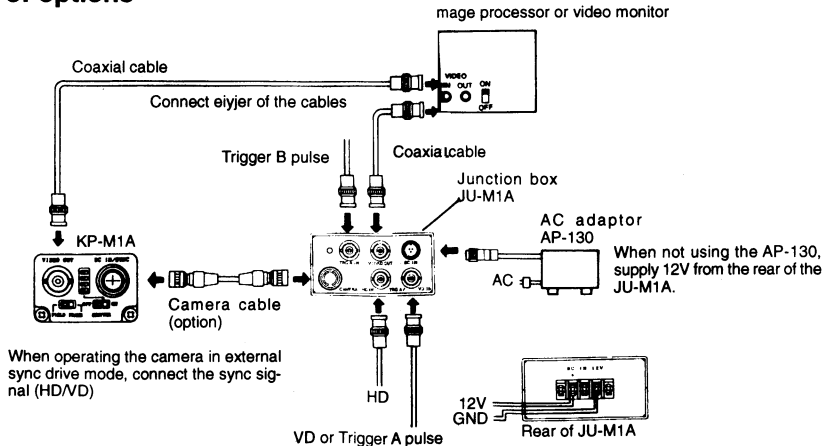
### Standard composition

- (1) Camera body (with IR cut filter)
- (2) Operation manual

### Optional accessories

- (1) Tripod adaptor TA-M1
- (2) 12-pin plug HR10A-10P-12S (01)
- (3) AC adaptor AP-130
- (4) Junction box JU-M1A
- (5) Camera cable 2m : C-201KSM  
5m : C-501KSM  
10m : C-102KSM

# Connection of options



# SIGNAL CONNECTION TO DC IN/SYNC CONNECTOR

Signal connection to each pin

Pin No.	Internal sync mode	External sync mode				
		HD-VD	Field · on · demand			
			ONE trigger	TWO trigger	Fixed shutter	Ext. shutter
1	GND	GND	GND	GND	GND	GND
2	+ 12V	+ 12V	+ 12V	+ 12V	+ 12V	+ 12V
3	Video output (GND)	Video output (GND)	Video output (GND)	Video output (GND)	Video output (Signal)	Video output (GND)
4	Video output (Signal)	Video output (Signal)	Video output (Signal)	Video output (Signal)	Video output (GND)	Video output (Signal)
5	—	HD input (GND)	—	—	—	HD input (Signal)
6	—	HD input (Signal)	—	—	—	HD input (Signal)
7	—	VD input (Signal)	TriggerA input (Signal)	TriggerA input (Signal)	TriggerA input (Signal)	VD input (Signal)
8	—	—	—	TriggerB input (GND)	—	TriggerB input (GND)
9	—	—	—	TriggerB input (Signal)	—	TriggerB input (Signal)
10	GND	GND	GND	GND	GND	GND
11	+ 12V	+ 12V	+ 12V	+ 12V	+ 12V	+ 12V
12	—	VD input (GND)	TriggerA input (GND)	TriggerA input (GND)	TriggerA input (GND)	VD input (GND)

Optional 12-pin plug: HR10A-10P-12S (01)



Viewed from  
this side

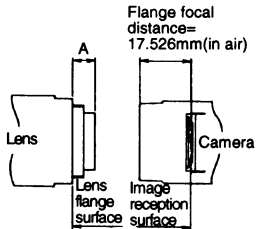


**Note:**

- The video signal cannot be fed simultaneously from both the VIDEO OUT connector and the DC IN/SYNC connector. If both the outputs are connected simultaneously, a proper picture cannot be obtained.
- Supply 12V DC in the range between 11 and 13V.

## OPTICAL SYSTEM

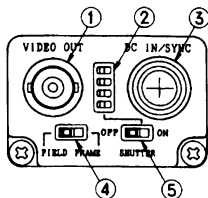
- Image size.  
2/3-inch
- The flange focal distance is 17.526mm (in air).
- Select such a lens as the length (A) from the flange surface of the lens to the end of the screw side is 8mm or less.



**Note** Flange focal distance cannot be adjusted.



# NAME OF EACH SECTION



## (1) VIDEO OUT (BNC) connector

A composite video signal (VS) is fed from this connector. Connect a 75-ohm coaxial cable between the connector and a video monitor or other video equipment.

## (2) Shutter speed select switches

Use these switches to set a shutter speed.

## (3) DC IN/SYNC connector

This connector is for a 12V DC input, a composite video signal (VS) output and an external sync signal input.

## (4) FIELD/FRAME integration mode select switch

Use this switch to select an integration mode. This switch is set to FRAME at factory.

## (5) SHUTTER ON/OFF switch

Set the SHUTTER ON/OFF switch to ON to establish the shutter mode.

## Setting of shutter speed

Speed (second)	※ 1	※ 2	1/125	1/250
Setting position				

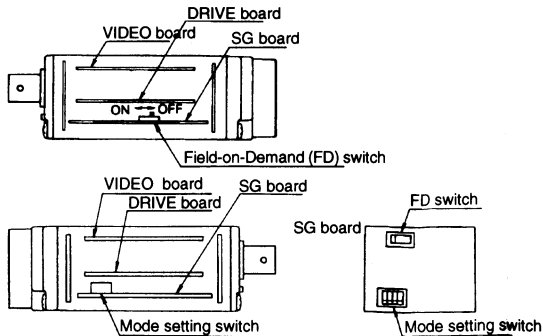
1/500	1/1000	1/2000	1/4000	1/10000

※ 11/60(EIA), 1/50(CCIR)

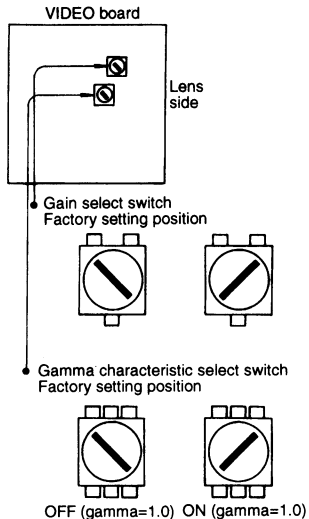
※ 21/100(EIA), 1/120(CCIR)

The higher the shutter speed, the greater the effect. However, since sensitivity lowers, adjust the lens iris or increase illumination. When the shutter is used, the flicker of an object may be emphasized. In such a case, use a light such as a DC lighting lamp which causes no flicker.

# ARRANGEMENT OF INTERNAL SWITCHES



	Normal mode	ONE trigger mode	TOW-trigger mode	Fixed shutter mode	Ext. shutter control mode
Mode setting switch					
FD switch	OFF (Stting at factory)	ON	ON	ON	OFF



## **SELECT SWITCH GAMMA CHARACTERISTIC**

The camera is provided with the gamma characteristic select switch. This switch is set to OFF at the factory.

**(1) Gamma: OFF (Gamma=1.0)**

In this mode, a linear output signal in accordance with the brightness of an object can be obtained.

**(2) Gamma: ON (Gamma=0.45)**

This mode is suitable for viewing a picture on a monitor screen.

## **GAIN SELECT SWITCH**

The gain of the camera can be switched between the normal gain mode and the AGC mode. This switch is set to the normal gain mode at the factory.

**(1) Normal gain mode**

In this mode, the video gain is fixed. (The noise amount is also fixed.)

**(2) AGC mode**

When the illumination on an object becomes lower than the rated level, gain is automatically increased. As gain increases, noise also increases.

# EXTERNAL SYNCHRONIZATION (2:1 INTERLACED)

When operating the camera by external drive signals, connect sync drive signals (HD,VD) to the DC IN/SYNC connector, then the mode is automatically switched from the internal sync mode to the external sync mode.

## ● Input signals

### HD and VD signals

HD EIA :  $f(H)=15.734\text{kHz} \pm 1\%$

CCIR :  $f(H)=15.625\text{kHz} \pm 1\%$

VDEIA :  $f(V)=59.94\text{Hz}$  [ $f(V)=f(H) \div 262.5$ ]

CCIR :  $f(V)=50\text{Hz}$  [ $f(V)=f(H) \div 312.5$ ]

## ● Input level

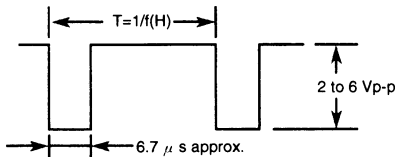
HD 2 to 6Vp-p, negative

VD 2 to 6Vp-p, negative

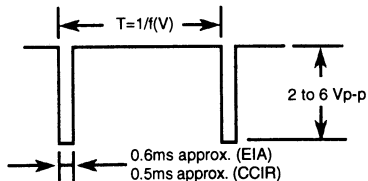
## ● Input impedance 1k ohms

## ● Input waveform

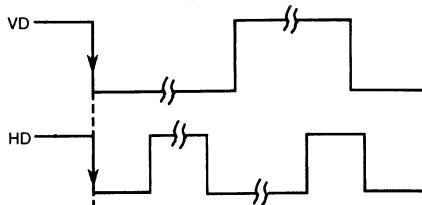
### ● Horizontal drive signal (HD)



## ● Vertical drive signal (VD)



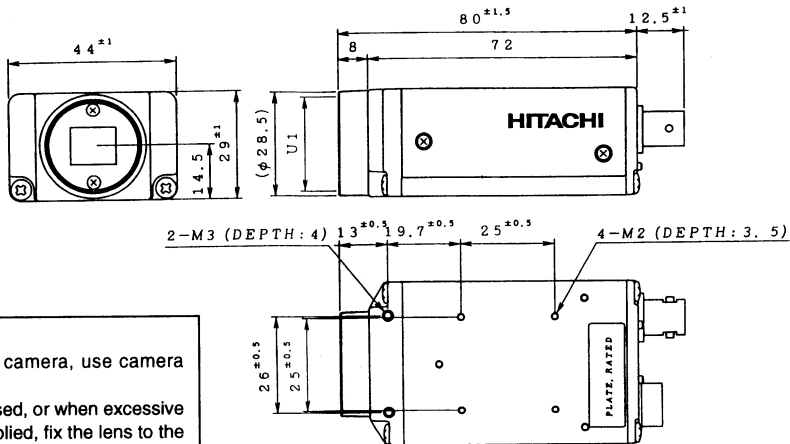
## ● Phase relationship between horizontal drive signal (HD) and vertical drive signal (VD)



Adjust the phase so that the falling edges of HD and VD are in phase ( $0 \pm 5 \mu\text{s}$ )

# EXTERNAL VIEW

● Camera KP-M1A



## Caution

For installation of the camera, use camera mounting holes A or B.

When a heavy lens is used, or when excessive shock or vibration is applied, fix the lens to the equipment, too.

# SPECIFICATIONS

- (1) Imaging device:** Interline transfer CCD
- Total number of pixels EIA: 811(H)×508(V)  
CCIR: 795(H)×596(V)
- Pixel pitch EIA: 11.64 μm(H),  
13.5 μm(V)  
CCIR: 11.6 μm(H),  
11.2 μm(V)
- Number of effective pixels EIA: 768(H)×494(V)  
CCIR: 752(H)×582(V)
- (2) Imaging area:** EIA: 8.94mm×6.67mm  
CCIR: 8.72mm×6.52mm  
(2/3-inch size)
- (3) Signal system:** Based on EIA or CCIR system  
(at normal operation)
- (4) Lens mount:** C mount
- (5) Flange focal distance:** 17.526mm
- (6) Horizontal scanning frequency:** EIA: 15.734kHz  
CCIR: 15.625kHz
- (7) Vertical scanning frequency:** EIA: 59.94Hz  
CCIR: 50Hz
- (8) Sync system:** Automatic switching between internal sync and external sync modes
- (9) Internal sync** scanning system: 2:1 interlaced  
Number of horizontal lines EIA: 525 TV lines  
CCIR: 625 TV lines  
 $f(v)=2f(H)/525(625 \text{ for CCIR})$
- (10) External sync input** HD/VD: 2 to 6Vp-p  
Input impedance: 1k ohms  
Frequency deviation: ± 1%
- (11) Video output:** 1.0Vp-p, 75 ohms, unbalanced  
Video: 0.7Vp-p  
Sync: 0.3Vp-p, negative
- (12) Horizontal resolution** EIA: 570 TV lines  
CCIR: 560 TV lines  
Vertical resolution EIA: 485 TV lines  
CCIR: 575 TV lines
- (13) Sensitivity:** 400 lx, f4, 3200K
- (14) Minimum illumination:** 0.3 lx, f1.4, AGC and GAMMA: ON, without IR cut filter
- (15) S/N:** 56dB
- (16) Electronic shutter:** 1/10000, 1/4000, 1/2000, 1/1000,  
1/500, 1/250, 1/125, 1/120(CCIR), 1/100(EIA)  
OFF(normal exposure)  
Set to OFF at the factory.

**(17)Integration mode:** Field or frame integration mode  
Set to frame integration mode at the factory.

**(18)Gamma correction:** Gamma=1.0 or correction  
Set to 1.0 at the factory.

**(19)AGC:** Fixed gain or AGC  
Set to fixed gain at the factory.

**(20)Field-on-Demand function**

● ON/OFF switchable by internal switch

● Switchable modes:ONE trigger, TWO-trigger, 1/1600s (EIA)/1/1000s (CCIR) fixed shutter, external shutter control, OFF (normal exposure)

\* Set to OFF at the factory

**(21)Power requirement:** 12V DC  $\pm$  1V

**(22)Power consumption:** 220mA approx.

**(23)Ambient temperature and humidity**

Operating – 10 to 50°C, 90% RH or less

Full specification 0 to 40°C, 50 to 70% RH

Storage: – 20 to 60°C, 70% RH or less

**(24)Anti-vibration:** 98m/s<sup>2</sup> (10 to 60Hz, amplitude: 0.98mm constant, 60 to 200Hz, amplitude: variable)  
(10 to 150 Hz sweep: 1 min. XYZ, 30 min.)

**(25)Resistance to shock**686m/s<sup>2</sup>

(Drop test, once each top, bottom, left and right)

**(26)Dimensions:** 44(W)  $\times$  29(H)  $\times$  72(D)mm

**(27)Mass:** 120g approx.

※ Specifications are subject to change without notice.

● **Operation Guide**

For more details, see the Operation Guide.

Please ask your sales representative about the Operation Guide.

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