

# **3-CCD Color Camera**

## **MODEL HV-F31F**

## **HV-F22F**

## **OPERATION MANUAL**



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

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

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

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

**Hitachi Kokusai Electric Inc.**

# IMPORTANT SAFETY INSTRUCTIONS

## 1. Read Instructions

All the safety and operating instructions should be read before the product is operated.

## 2. Retain Instructions

The safety and operating instructions should be retained for future reference.

## 3. Heed Warnings

All warnings on the product and the operating instructions should be adhered to.

## 4. Follow Instructions

All operating and use instructions should be followed.

## 5. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

## 6. Attachments

Do not use attachments not recommended by the product manufacturer as they may cause hazards.

## 7. Water and Moisture

Do not use this product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub; in a wet basement; or near a swimming pool; and the like.

## 8. Accessories

Do not place this product on an unstable cart, stand, tripod, bracket, or table. The product may fall, causing serious injury to a child or adult, and serious damage to the product. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

## 9. Moving

A product and cart combination should be moved with care.

Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

## 10. Ventilation

Slots and openings in the cabinet are provided for ventilation and to ensure reliable operation of the product and to protect it from overheating, and these openings must not be blocked or covered.

The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should not be placed in a

built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

### **11. Power Sources**

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

### **12. Grounding or Polarization**

This product is equipped with a three-wire grounding-type plug a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

### **13. Power-Cord Protection**

Power-supply cords should be routed to that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plug, convenience

receptacles, and the point where they exit from the product.

### **14. Lightning**

For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the product due to lightning and power-line surges.

### **15. Overloading**

Do not overload wall outlets, extension cords or integral convenience receptacles as this can result in a risk of fire or electric shock.

### **16. Object and Liquid Entry**

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

### **17. Inflammable and Explosive Substance**

Avoid using this product where there are gases, and also where there are inflammable and explosive substances in the immediate vicinity.

### **18. Heavy Shock or Vibration**

When carrying this product around, do not subject the product to heavy shock or vibration.

## **19. Servicing**

Do not attempt to service this product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

## **20. Damage Requiring Service**

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power-supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the product.
- c. If the product has been exposed to rain or water.
- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e. If the product has been dropped or damaged in any way.
- f. When the product exhibits a distinct change in

performance-this indicates a need for service.

## **21. Replacement Parts**

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part.

Unauthorized substitutions may result in fire, electric shock, or other hazards.

## **22. Safety Check**

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

## **23. Wall or Ceiling Mounting**

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

## **24. Heat**

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

# WICHTIGE SICHERHEITSANWEISUNGEN

## 1. Alle Anweisungen lesen

Vor Betrieb des Erzeugnisses sollten alle Sicherheits- und Bedienungsanleitungen gelesen werden.

## 2. Die Anweisungen aufbewahren

Die Sicherheits- und Bedienungsanleitungen sollten fünftigen Bezug aufbewahrt werden.

## 3. Warnungen beachten

Die Warnungen auf dem Erzeugnis und in den Bedienungsanleitungen sollten beachtet werden.

## 4. Anweisungen befolgen

Alle Bedienungsanleitung- und Verwendungsanweisungen sollten befolgt werden.

## 5. Reinigung

Den Stecker des Geräts vor Reinigung aus der Steckdose ziehen. Keine flüssigen Reinigungsmittel oder Aerosolreiniger verwenden. Zum Reinigen einen feuchten Lappen verwenden.

## 6. Zubehör

Nur vom Hersteller des Erzeugnisses empfohlenes Zubehör verwenden, da es sonst zu Störungen kommen kann.

## 7. Wasser und Feuchtigkeit

Dieses Erzeugnis nicht in der Nähe von Wasser verwenden - z.B. in der Nähe einer Badewanne, eines Waschbeckens, einer Küchenspüle, eines

Waschzubehers, in einem nassen Keller, in der Nähe eines Schwimmbeckens usw.

## 8. Aufstellung

Das Erzeugnis nicht auf einen instabilen Wagen, Stand, Dreifuß, Träger oder Tisch stellen.

Das Erzeugnis kann sonst herunterfallen und ein Kind oder einen Erwachsenen schwer verletzen.

Außerdem kann das Gerät schwer beschädigt werden. Nur mit einem Wagen, Stand, Dreifuß, Träger oder Tisch verwenden, der vom Hersteller empfohlen oder mit dem Erzeugnis verkauft worden ist. Für jegliche Anbringung sollten die Anweisungen des Herstellers befolgt werden, und das vom Hersteller empfohlene Anbringungszubehör sollte verwendet werden.

## 9. Eine Kombination von Erzeugnis und Wagen sollte vorsichtig bewegt werden

Schneller Halt, übermäßige Krafteinwirkung und unebene Oberflächen können Umkippen der Kombination von Erzeugnis und Wagen verursachen.

## 10. Ventilation

Schlitze und Öffnungen im Gehäuse dienen der Ventilation. Sie sind für zuverlässigen Betrieb des Gerätes und Schutz vor Überhitzung

erforderlich und dürfen nicht blockiert oder abgedeckt werden.

Die Öffnungen sollten niemals dadurch blockiert werden, daß, das Gerät auf ein Bett, ein Sofa, einen Teppich oder eine ähnliche Oberfläche gestellt wird.

Das Gerät sollte nur dann in Einbauinstallation wie in einem Bücherschrank oder einem Gestell verwendet werden, wenn angemessene Ventilation vorgesehen ist bzw. Die Anweisungen des Herstellers befolgt worden sind.

### **11. Stromversorgung**

Dieses Erzeugnis sollte nur an der auf dem Typenschild angegebenen Stromversorgungsart betrieben werden. Wenn Sie nicht sicher sind, was für eine Stromversorgung Sie haben, so wenden Sie sich bitte an Ihren Erzeugnishändler oder an das lokale Elektrizitätswerk. Beziehen Sie sich für Batteriebetrieb oder andere Stromquellen vorgesehene Erzeugnisse bitte auf die Bedienungsanleitungen.

### **12. Erdung oder Polarisierung**

Dieses Erzeugnis ist mit einem Schutzkontaktstecker mit drei Leitern ausgerüstet, mit einem Erdungskontakt. Dieser Stecker paßt

nur in ein schuko-Steckdose. Dies ist eine Sicherheitsmaßnahme. Wenn Sie den Stecker nicht in die Steckdose stecken können, so wenden Sie sich bitte an ihren Elektriker, damit er die veraltete Schutz des Schutzkontaktsteckers unwirksam.

### **13. Netzkabelschutz**

Netzkabel sollten so verlegt werden, daß möglichst nicht darauf getreten wird und daß sie nicht eingeklemmt werden, mit besonderer Beachtung der Kabel an Stackern, Verlängerungskabeln und dem Austritt des Kabels aus dem Erzeugnis.

### **14. Blitzschlag**

Für zusätzlichen Schutz des Erzeugnisses während eines Gewitters oder bei Nichtverwendung für lange Zeit den Stecker aus der Steckdose ziehen. Dies verhütet Beschädigung durch Blitzschlag und Netzspannungsstöße.

### **15. Überlastung**

Wandsteckdosen, Verlängerungskabel und eingebaute Bequemlickeitssteckdosen nicht überlasten, da dies Feuer oder elektrischen Schlag verursachen kann.

## **16. Eindringen von Fremdkörpern und Flüssigkeit**

Niemals Objekte irgendwelcher Art durch die Öffnungen in das Gerät schieben, da diese unter hoher Spannung stehende Teile berühren oder kurzschließen können, wodurch es zu Feuer oder elektrischem Schlag kommen kann. Niemals Flüssigkeiten irgendwelcher Art auf das Erzeugnis verschütten.

## **17. Entflammbare und explosive Substanzen**

Vermeiden Sie Verwendung dieses Erzeugnisses an Orten mit Gasen bzw. entflammbaren oder explosiven Substanzen in der direkten Umgebung.

## **18. Starke stöße oder Vibrationen**

Setzen Sie das Erzeugnis beim Transport nicht starken Stößen oder Vibrationen aus.

## **19. Wartung**

Versuchen Sie nicht, dieses Erzeugnis Selbst zu warten, da Sie sich durch Öffnen bzw. Entfernen von Abdeckungen hohen Spannungen und sonstigen Gefährdungen aussetzen können.

Beziehen Sie sich für jegliche Wartung auf qualifiziertes Wartungspersonal.

## **20. Beschädigung, die Wartung erfordert**

Ziehen Sie den Stecker dieses Erzeugnisses aus der Steckdose und wenden Sie sich an

qualifiziertes Wartungspersonal, wenn eine der folgenden Bedingungen vorliegt:

- a. Wenn das Netzkabel oder der Stecker beschädigt ist.
- b. Bei Eindringen von Flüssigkeit oder Fremdkörpern in das Gerät.
- c. Wenn das Erzeugnis Regen oder Wasser ausgesetzt worden ist.
- d. Wenn das Erzeugnis bei Befolgen der Bedienungsanleitungen nicht normal funktioniert.  
Nur die Regelelemente verstellen, die in den Bedienungsanleitungen behandelt werden, da unangemessene Einstellung anderer Regelelemente Beschädigung verursachen kann und oft beträchtliche Arbeit durch einen qualifizierten Techniker erfordert, um das Erzeugnis wieder, zu normalem Betrieb zurückzubringen.
- e. Wenn das Erzeugnis fallen gelassen oder beschädigt worden ist.
- f. Wenn das Erzeugnis eine klare Änderung in der Leistung zeigt-dies weist darauf hin, daß Wartung erforderlich ist.

## **21. Ersatzteile**

Wenn Ersatzteile erforderlich sind, darauf achten, daß der Wartungstechniker nur die vom Hersteller festgelegten Ersatzteile oder Teile mit den gleichen Charakteristiken wie die ursprünglichen Teile verwendet. Unautorisierte Ersatzteile können Feuer, elektrischen Schlag oder sonstige Gefährdungen verursachen.

## **22. Sicherheitsprüfung**

Bitten Sie den Wartungstechniker nach der Vollendung von Wartung oder Reparaturarbeiten an diesem Erzeugnis um die Durchführung von Sicherheitsprüfungen, um zu bestimmen, daß das Erzeugnis im angemessenen Betriebszustand ist.

## **23. Anbringung an der Wand oder an der Decke**

Das Erzeugnis sollte nur entsprechend den Empfehlungen des Herstellers an einer Wand oder an der Decke angebracht werden.

## **24. Wärme**

Das Erzeugnis sollte fern von Wärmequellen wie Radiatoren, Heizwiderständen, Öfen und anderen Wärme erzeugenden Erzeugnissen (einschließlich Verstärkern) aufgestellt werden.



# MISES EN GARDE IMPORTANTES

## 1. Lire les instructions

Lire toutes les instructions de sécurité et de fonctionnement avant de faire fonctionner l'appareil.

## 2. Conserver ces instructions

Conserver les instructions de sécurité et de fonctionnement à des fins de référence ultérieure.

## 3. Tenir compte des avertissements

Tous les avertissements qui figurent sur l'appareil et dans le mode d'emploi devront être respectés.

## 4. Observer les instructions

Observer toutes les instructions de fonctionnement et d'utilisation.

## 5. Nettoyage

Avant de procéder au nettoyage, débrancher l'appareil de la prise secteur. Ne pas utiliser de produits de nettoyage liquides ou en aérosol. Nettoyer l'appareil avec un chiffon humide.

## 6. Fixations

Ne pas utiliser de fixations non recommandées par le fabricant de l'appareil car elles pourraient être source de danger.

## 7. Eau et humidité

Ne pas utiliser l'appareil à proximité d'eau-ar exemple près d'une baignoire, d'un lavabo, d'un évier

ou d'un bac à lessive, dans un sous-sol humide, ou près d'une piscine, etc.

## 8. Accessoires

Ne pas placer l'appareil sur un chariot, un socle, un pied, un support ou one table instables L'appareil pourrait tomber, blessant grièvement des enfants ou des adultes, et étant sérieusement endommagé.

Utiliser exclusivement le chariot, le socle, le pied, le support ou la table recommandés par le fabricant, ou vendus avec l'appareil. Pour tout montage de l'appareil, respecter les instructions du fabricant, et utiliser à cette fin l'accessoire de montage recommandé par le fabricant.

## 9. L'appareil monté sur son chariot devra être déplacé avec précaution

Des arrêts brusques, une force excessive et des surfaces irrégulières pourraient provoquer le renversement de l'ensemble appareil-chariot.

## 10. Ventilation

Les fentes et les ouvertures du coffret sont prévues pour la ventilation ainsi que pour garantir un fonctionnement en toute sécurité de

l'appareil et le protéger de toute surchauffe, et ces ouvertures ne devront donc être ni obstruées ni recouvertes. Ne jamais obstruer les ouvertures en plaçant l'appareil sur un lit, un sofa, un tapis ou toute surface similaire. Ne jamais placer l'appareil dans un support confiné, par exemple une bibliothèque ou une étagère, sans ventilation suffisante ou sans respecter les instructions du fabricant.

#### **11. Sources d'alimentation**

L'appareil devra être alimenté exclusivement sur le type d'alimentation indiqué sur l'étiquette signalétique. Si l'on n'est pas sûr du type d'alimentation du local, consulter le revendeur de l'appareil ou la compagnie d'électricité locale. Pour les appareils qui fonctionnent sur batterie ou sur d'autres sources, voir le mode d'emploi.

#### **12. Mise à la terre ou polarisation**

L'appareil est doté d'une fiche trifilaire avec mise à la terre, dont la troisième broche assure la mise à la terre. Cette fiche ne rentrera que dans les prises trifilaires de mise à la terre. Ceci est une mesure de sécurité. Si la fiche ne rentre pas dans la prise, faire remplacer la prise défectueuse par un électricien.

Ne pas rendre vaine la mesure de sécurité assurée par cette prise avec mise à la terre.

#### **13. Protection du cordon d'alimentation**

Acheminer les cordons d'alimentation de façon qu'on ne risque pas de marcher dessus ou de les coincer sous un objet placé dessus ou contre eux.

Faire particulièrement attention aux fiches des cordons, à la proximité des prises, et à l'endroit où ils ressortent de l'appareil.

#### **14. Foudre**

Pour renforcer la protection de l'appareil pendant un orage, ou si l'on s'en éloigne ou qu'on reste longtemps sans l'utiliser, le débrancher de la source d'alimentation. Ceci permettra d'éviter tout dommage de l'appareil dû à la foudre et aux surtensions de ligne.

#### **15. Surcharge**

Ne pas surcharger les prises, rallonges et prises multiples car cela pourrait entraîner un risque de feu ou de choc électrique.

#### **16. Pénétration d'objets et de liquides**

Ne jamais enfoncer d'objets d'aucune sorte dans les ouvertures de l'appareil car ils pourraient toucher des points de tension dangereuse ou court-circuiter des pièces, ce qui pourrait

provoquer un feu ou un choc électrique. Ne jamais renverser de liquide d'aucune sorte sur l'appareil.

#### **17. Substances inflammables et explosives**

Eviter d'utiliser l'appareil en présence de gaz, ainsi qu'à proximité immédiate de substances inflammables et explosives.

#### **18. Chocs ou vibrations violents**

Lorsqu'on transporte l'appareil, ne pas le soumettre à des chocs ou des vibrations violents.

#### **19. Réparations**

Ne pas tenter de réparer l'appareil soi-même car le fait d'ouvrir ou de retirer les caches risque d'exposer l'utilisateur à des tensions dangereuses notamment. Confier toute réparation à un personnel qualifié.

#### **20. Dommages nécessitant réparations**

Débrancher l'appareil de la source d'alimentation et confier les réparations à un personnel qualifié dans les cas suivants:

- a. Lorsque le cordon d'alimentation ou sa fiche sont endommagés
- b. Si du liquide s'est renversé sur l'appareil ou que des objets sont tombés dedans
- c. Si l'appareil a été exposé à la pluie ou à l'eau.

d. Si l'appareil ne fonctionne pas normalement lorsqu'on observe les instructions d'utilisation.

Ne régler que les commandes couvertes par le mode d'emploi ; en effet, un réglage incorrect des autres commandes pourrait entraîner des dommages et nécessiteront souvent des travaux de réparation coûteux par un technicien qualifié pour remettre l'appareil en état de marche.

e. Si l'appareil est tombé ou qu'il a été endommagé.

f. Si l'appareil affiche une nette modification de ses performances, cela signifie qu'il a besoin d'être réparé.

#### **21. Pièces de rechange**

Si l'on a besoin de pièces de rechange, veiller à ce que le technicien de réparation utilise exclusivement les pièces de rechange spécifiées par le fabricant ou des pièces ayant les mêmes caractéristiques que les pièces d'origine. Les pièces de rechange non autorisées risquent de provoquer un feu, un choc électrique et autres dangers.

## **22. Vérificaton de sécurité**

Après tout travail d'entretien ou de réparation de l'appareil, demander au technicien de réparation d'effectuer les vérifications de sécurité pour s'assurer que l'appareil est en bon état de marche.

## **23. Montage au mur ou au plafond**

L'appareil ne pourra être monté au mur ou au plafond que de la manière recommandée par le fabricant.

## **24. Chaleur**

Eloigner l'appareil des sources de chaleur, telles que radiateurs, appareils de chauffage, cuisinières, et de tour produit engendrant de la chaleur (y compris les amplificateurs).

## IMPORTANT NOTICE

### For USA

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. This equipment 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 this product 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.

### For Canada

This product does not exceed the class A/class B 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 rVglement sur le brouillage radioélectrique édicté par le ministère des communications du Canada.

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# Standard composition

Check when unpacking.

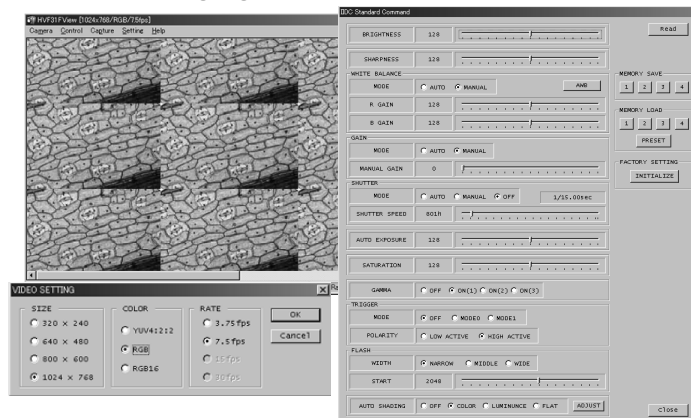
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# CD-ROM

An IEEE1394 driver and demonstration viewer software that displays an image to PC monitor and control the camera functions are included within the belonging CD-ROM.

As for the installation procedure of an IEEE1394 driver and viewer software, please read the installation manual and operation manual within CD-ROM carefully.

## Viewer Software



**NOTE:**

- 1) The included driver and also demonstration software within CD-ROM operate only in Windows 98 SE/ME/2000/XP.
- 2) The viewer software may not operate normal when it is used for the other camera, because software for HV-F31F and HV-F22F.
- 3) In the case that it stopped normal operating during the use of viewer software, stop a viewer software, turn off and on the camera power supply or pull and push the IEEE1394 cable, execute viewer software once again.
- 4) In the case that the performance (the CPU clock, installation memory etc.) of PC is not sufficient, viewer software may not execute normally. Please use PC of following specification.

Item	Specifications
CPU	Intel Celeron 533MHz or more
Memory	256MByte or more
Display Card	24bit RGB color display card or more
Interface Card	built-in OHCI IEEE1394 port or PCI-Card or PC-Card
Operating System	Windows 98SE / Me / 2000 / XP
Others	DirectX 8.0 or more

- 5) Hitachi kokusai Electric. Inc does not guarantee it, regarding the faulty, damage of the hardware and also software of the customer by a driver and also viewer software.



## Overview

The Hitachi HV-F31F/HV-F22F are high precision 3CCD progressive scan color camera, which has single chip digital processing LSI, a C mount prism, three 1/3-inch 800,000 pixels (HV-F31F) / 1/2-inch 1,450,000 pixels (HV-F22F) square CCDs, and an IEEE1394 digital output.

A newly developed multi-functional LSI use the accurate 14 bit digital processing technology, which performs the high picture quality signal processing and the picture compensating functions, beyond the capability of the other conventional analog cameras. The IEEE1394 interface reduces the system cost without an image capturing board and special connecting cable.

## Features

- **Camera signal processor is single chip LSI.**

The Hitachi's most advanced technology (0.18 um design process, 1.8V internal core drive voltage) produces a single newly developed ultra LSI chip (3 million gates), and contributes to the downsizing and the low power of the camera. In addition, the 12-bit A/D converter and 14 bit internal processor provide high S/N and wide dynamic range.

- **High quality picture**

Excellent color reappearance and high definition are materialized by CCD with a high sensitivity micro lens and LSI signal processing technology.

- **6 vector masking**

Independent six colors masking is the Hitachi innovation for optimizing color balance. The saturation and the hue of 6 colors (Red, blue, green, cyan, magenta and yellow) are adjusted independently to deliver the best color in image capture, microscope and other applications.

- **Auto white shading compensation**

Color shading due to the aberration of C mount lens is automatically compensated (reduced).

# Notes to users

## Important safety notes

- Use this camera with a 12 VDC power supply.
- Observe that flammable objects, water or metal do not enter the camera interior. These may lead to failure or accident.
- Do not modify the camera or use the camera with external covers removed. These may cause failure, void any warranties and pose a safety hazard.
- Stop using the camera at the approach of an electrical storm (thunder audible). Protect the camera from rain if using it outdoors.
- In event the camera shows any abnormality, switch off the camera and disconnect the power cord. Contact a Hitachi Denshi service representative.

## Operating considerations

### ● Power supply

Check that the supplied voltage is between 10.5 and 15 VDC. Inadequate voltage can affect color fidelity and cause noise, while voltage over 15 V can damage the camera.

### ● Connectors

Confirm the power is off before connecting or disconnecting a signal cable. Grasp connectors by the body, not the attached wires.

### ● Lens

The correct lens is important for deriving optimum performance from the camera. Consult a Hitachi Denshi dealer for a selection of fine lenses according to the application.

### ● Installation and storage sites

The following types of environment can impair performance, lead to damage, pose safety hazards and shorten the useful life of the camera. Select the sites for installing the storing the camera carefully.

- Direct sunlight, rain or snow
- Flammable or corrosive gasses
- Very hot or cold (beyond 0 to 4 °C operating, -20 to 60 °C storage)
- Humid or dusty
- Exposed to vibration or shock
- Strong electrical or magnetic fields
- Exceptionally strong light
- 

### Continuous operation

In situations where the camera is used continuously for long periods of time, the ambient temperature should be kept below 40 °C in order to avoid accelerated deterioration of internal parts and to derive maximum long-term reliability.

## Cleaning

- A photographer's blower or lens brush can be used for clearing dust from the lens and optical filters.
- Wipe dust from the case with a soft dry cloth. If soiling is severe, moisten the cloth with a solution of neutral detergent. Afterwards, wipe the cover with a dry cloth.
- Do not use petroleum distillates, alcohol or spray type cleaners.

## Transportation

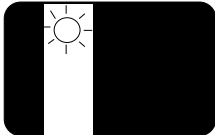
Remove the lens (install lens mount cap) and other attachments. Pack the camera carefully in its original or equivalent container. Use ample cushioning to protect the camera from physical shock.

## CCD properties

The following phenomena are inherent to a charge coupled device imaging element and do not indicate malfunction.

### 1) Smear and blooming

Vertical bands are visible when a strong light enters the scene. Adjust the camera aiming direction carefully to avoid strong direct or reflected light.



### 2) Fixed pattern noise

High ambient temperature can cause fixed pattern noise to appear throughout the scene.

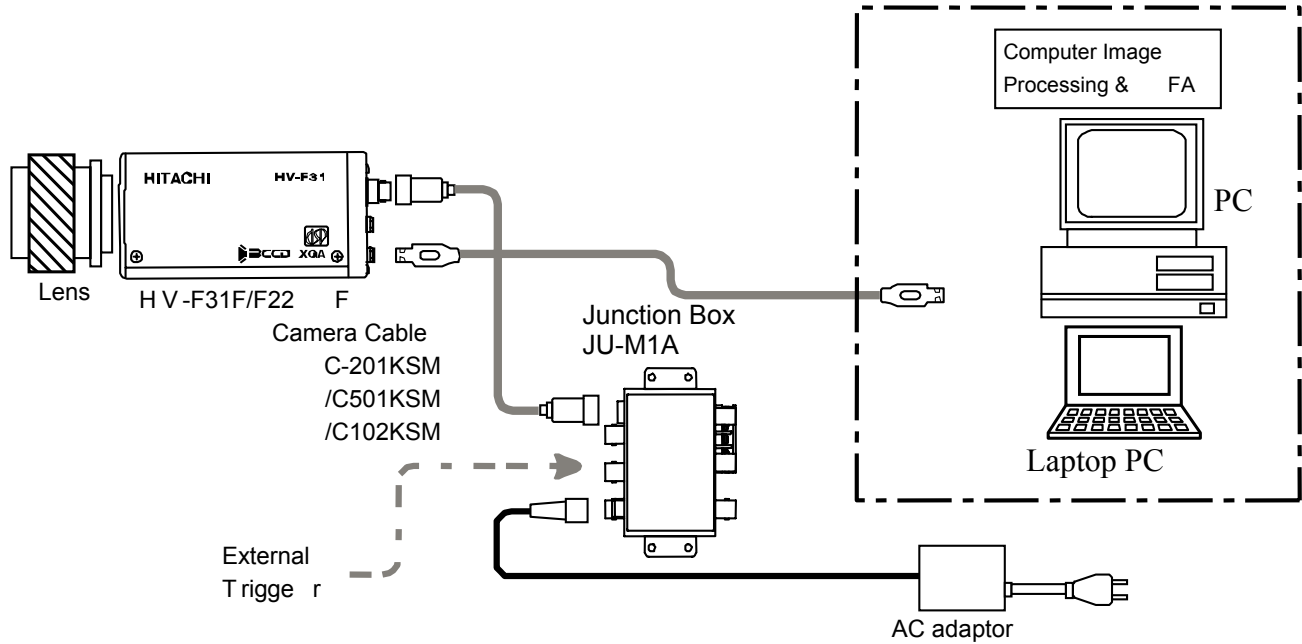
### **3) Moire**

Interaction between patterns can produce an additional "phantom" pattern to appear. The CCD picture elements (pixels) are arranged in a pattern, which can interact with a pattern in the scene (e.g., a performer wearing a finely striped necktie) to result in a Moire pattern. The effect should be considered when selecting costumes, props and other scene elements.

### **4) Ghosting**

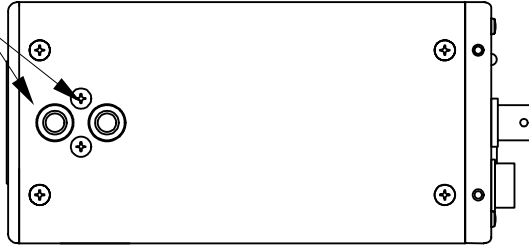
Strong direct or reflected light near an object of interest can cause ghosting of the object to appear in the picture. The effect is more obtrusive with certain iris settings and lens types. Select the scene layout and camera pointing direction carefully in order to avoid this effect.

# System example

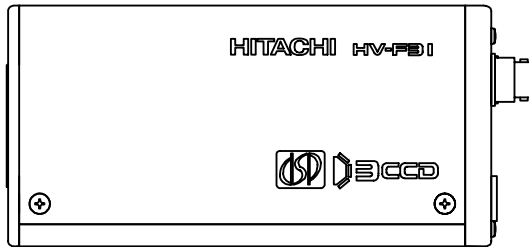
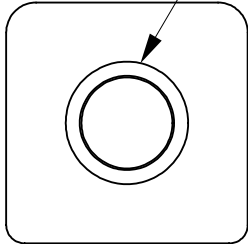


# Section names and functions

Camera mounting  
screw holes



Lens mount  
(C mount)



Camera mounting  
screw holes

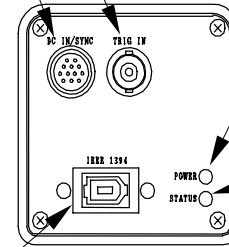


**DC IN/SYNC connector**

Connect to +12 VDC power supply.  
Input for external HD/VD and sync signals.

**TRIG IN connector**

External trigger signal input



**Pilot lamp**

Light when power is  
supplied.

**Status lamp**

Flashes when  
transmitting

**IEEE1394 connector** (see Note)

IEEE1394 cable computer side  
IEEE1394 connector end

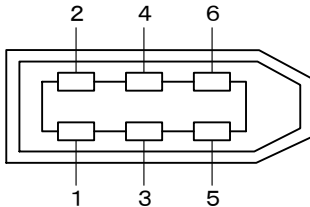
**Note**

When power is supplied from IEEE1394,  
check for proper current and voltage. If not  
correctly indicated, a separate power supply  
is required.

# Connector

## 1. IEEE1394 connector

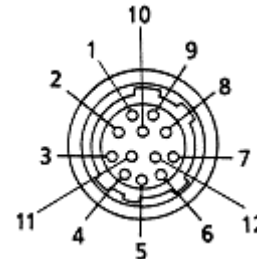
Pin No.	Signal designation
1	+12V input
2	GND
3	TPB-
4	TPB+
5	TPA-
6	TPA+



## 2. DC IN/SYNC connector (HR10A-10R-12PB(01))

Pin NO.	Signal designation
1	GND
2	+12V input
3	GND
4	FLASH OUT
5	GND
6	HD IN
7	VD IN
8	GND
9	TRIG (H)
10	TRIG (C)
11	+12V input
12	GND

Plug: HR10A-10P-12S



# Lens

## CAUTION:

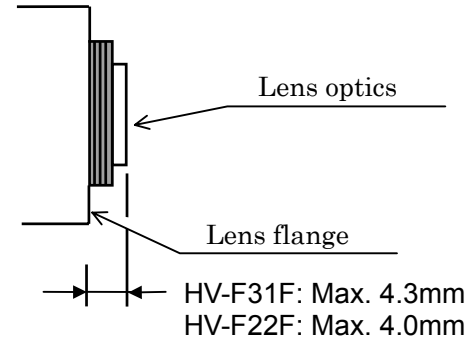
Observe the dimensions of the lens mounting selection as illustrated at the right.

If the dimensions are not observed, do not use such a lens, because the lens and the camera will be damaged.

## Selecting a lens

The proper lens is important for obtaining adequate performance from the camera. Especially in the case of a three elements CCD system C mount camera, the lens incidence and exit distances are important. If separation is too short, color irregularity is apt to occur at the top and bottom of the image.

Conversely if too long, where the lens iris is a nearly fully open, resolution is impaired, while shading and flare can seriously detract from image quality. When using 3 CCD color system camera, it is also recommended to use a lens designed for this purpose.



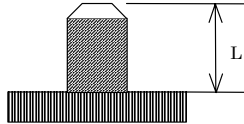


# Camera mounting

The camera is provided with threaded screw holes at the top and bottom. These allow mounting to either a tripod or a mounting bracket.

Screw type: U 1/4-20

Length: 4.5 to 6 mm



Screws longer than 6 mm can cause internal damage, while less than 5 mm prevents secure fastening and risks dropping to cause damage and injury.

## Control and Status register (CSR)

HV-F31F and HV-F22F differ from earlier conventional cameras in that camera functions can be set by entering predetermined setting commands in the Control and Status register (CSR) of the 1394-based Digital Camera Specification Ver. 1.30.

Common and camera-specific CSR register setting operations are described below.

Indication example: Function name           (CSR: xxxx xxxx h)  
                          Function description

Lower 32 bits of 64 bit CSR address are displayed.

ex: F0F0 0800 h

      means BUS\_ID, NODE\_ID, FFFF F0F0 0800 h.

## 1. IIDC Standard CSR

### (1) BRIGHTNESS

(CSR: F0F0 0800 h)

Master black level is adjusted

#### -Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

Can be set in range of 00h to FFh. Setting value to 00h side lowers black level. FFh side raises black level.

### (2) SHARPNESS

(CSR: F0F0 0808 h)

Sharpness level adjustment (object contour correction)

#### -Manual adjustment-

Setting value 820000xx h xx: 00h to FFh (standard 80h)

Contour correction can be set in range of 00h to FFh. Setting value toward 00h side reduces correction for softer contours. Setting toward FFh side increases correction for sharper contours.

### (3) WHITE BALANCE

(CSR: F0F0 080C h)

White balance adjustment

#### -Manual adjustment-

Setting value 820xx0yy h xx: 00h to FFh (B gain)

yy: 00h to FFh (R gain)

White balance is adjusted manually by adjusting R and B gain. Gain is reduced at 00h side and raised at FFh side.

**-One Push Auto White Balance (AWB)-**

Setting value 86000000 h

State for automatic white balance adjustment.

**-AUTO (ATW)-**

Setting value 83000000 h

White balance is adjusted in real time (automatic tracking). An effective function when the scene is subject to changes in color temperature of the light source. The speed for changing the color temperature is selected by **A. WHT SPEED**.

**(4) GAIN**

**(CSR: F0F0 0820 h)**

Electrical sensitivity is adjusted.

**-Manual adjustment-**

Setting value 82000xxx h                      xxx: 000h to 0C0h (1dB  $\div$  010h)

Adjusts electrical sensitivity in the range of 0 to 12 dB.

**-AUTO-**

Setting value 83000000 h

Gain is automatically adjusted in the range of 0 to 12 dB in response to light source brightness.

**(5) SHUTTER**

**(CSR: F0F0-081C h)**

Sets electronic shutter speed.

**-OFF (HV-F22:1/15sec, HV-F31:1/30) -**

Setting value 80000000 h

Switches off shutter operation.

### -Manual adjustment-

Setting value 82000xxx h                      xxx: (HV-F22) 7C5h to B6Ch / (HV-F31) 789h to B27h  
Electronic shutter can be set in the range of 4 to 1/100,000 second.

Shutter speed setting value can be derived as follows.

$$\text{OFF\_SPEED} = 15 \text{ (HV-F22), } 30 \text{ (HV-F31).}$$

- **Cause of shutter speed  $\leq (1 / \text{OFF\_SPEED})$**

a) Setting value obtained from fluorescent time.

$$\text{nnnh} = 800h + \log_{0.99}(\text{OFF\_SPEED} \times \text{"Shutter Speed"})$$

b) Fluorescent time obtained from setting value.

$$\text{Shutter Speed[sec]} = \text{OFF\_SPEED} \times 0.99^{(\text{nnn}-800h)}$$

Ex. 1 Fluorescent time with HV-F31 = setting value nnn to obtain 1/100 second.

$$\begin{aligned} & 800h + \log_{0.99}(30 \times (1/100)) \\ & = 800h + \log(30 \times (1/100)) / \log 0.99 \\ & = \underline{878h} \end{aligned}$$

Ex. 2 Setting value nnn that produces 1/100 second fluorescent time with HV-F31F.

$$(1/30) \times 0.99^{(878h-800h)} = \underline{1/100(\text{sec})}$$

- **Cause of shutter speed  $> (1 / \text{OFF\_SPEED})$**

a) Setting value obtained from fluorescent time.

$$\text{nnnh} = 801h - ( \text{OFF\_SPEED} \times \text{"Shutter Speed"} )$$

b) Fluorescent time obtained from setting value.

$$\text{Shutter Speed[sec]} = (801h - nnn) / \text{OFF\_SPEED}$$

Example Fluorescent time = 1/7.5s usable as setting value nnn with HV-F31F.

$$801h - (30 \times (1/7.5)) = \underline{7FDh}$$

#### **-AUTO-**

Setting value 83000000 h

Auto electronic shutter operates to vary the shutter speed in the range of OFF to 1/100,000 second in response to light source brightness.

If light is excessive, a suitable level is selected for maintaining a video output. This function is effective when using microscope or other optical system without an automatic lens iris.

### **(6) AUTO EXPOSURE**

**(CSR: F0F0 0804 h)**

At auto gain or shutter setting, the sensitivity is automatically adjusted to maintain the proper video level.

#### **-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh (standard:80 h)

Video level decreases toward 00h and increases toward FFh.

### **(7) SATURATION**

**(CSR: F0F0 0814 h)**

Color saturation is adjusted.

#### **-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh (standard: 80 h)

Saturation is reduced toward 00h and raised toward FFh.

## (8) GAMMA

(CSR: F0F0-0818 h)

Gamma correction is adjusted.

**-OFF-**

Setting value 80000000h

Gamma correction is set to OFF.

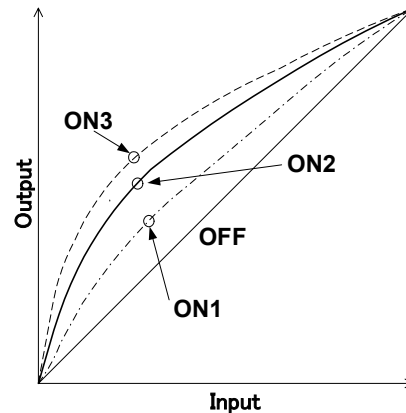
**-Manual adjustment-**

Setting value 8200000x h x: 0- ON1, 1- ON2, 2- ON3, F- Variable  
Positions 1,2 and 3 are effective for additionally fine adjustment of RGB gamma.

- ON1: Dark component gradation reduced.
- ON2: Standard setting
- ON3: Dark component gradation increased.

When setting to Variable, **R GAMMA (CSR: F200 0054 h)**,

**G GAMMA (CSR: F200 0058 h)**, **B GAMMA (CSR: F200 005C h)** of Setting value become to effect and adjust the detail gamma.



## (9) TRIGGER

(CSR: F0F0 0830 h)

Sets external trigger operating mode.

**-OFF-**

Setting value 80000000 h

Trigger function set to OFF

**-Manual adjustment-**

Setting value 8x0y0000 h

x: 2- LOW ACTIVE, 3- HIGH ACTIVE  
y: 0- MDOE0, 1- MODE1

Trigger mode polarity is switched at external signal values x and y.

See trigger operation details and timing chart (page 39).

**(10) INITIALIZE**

**(CSR: F0F0 0000 h)**

Return equipment to status at time of release from factory.

**-Initialization-**

Setting value 80000000 h

**(11) MEMORY SAVE (EXECUTE)**

**(CSR: F0F0 0618 h)**

Make back up of presently effective memory channels.

**-BACK UP execute-**

Setting value 80000000 h

**(12) MEMORY SAVE (Ch SET)**

**(CSR: F0F0 0620 h)**

Select channel carried out memory backup.

**-channel set-**

Setting value x0000000 h

x: 1- ch1, 2- ch2, 3- ch3, 4- ch4

**(13) CURRENT MEMORY**

**(CSR: F0F0 0624 h)**

Loading memory channel designating data

**-LOAD BACK UP-**

Setting value x0000000 h

x: 0- FACTORY SETUP, 1- ch1, 2- ch2, 3- ch3, 4- ch4



## 2. Advance CSR

### 2-1. Image color reproduction and color balance related CSR

#### (1) MASKING (CSR: F200 0020 h)

RGB and Ye Cy Mg color saturation and hue can be separately varied (6 vector independent masking). Color reproduction detail and fidelity are effectively enhanced.

When engaged, **R saturation (CSR: F200 0024) - M hue ((CSR: F200 0050)** can be set, with color phase and saturation adjusted for each color phase.

**-OFF-**

Setting value 80000000 h

**-ON-**

Setting value 82000000 h

#### a) (MASKING) R SATURATION (CSR: F200 0024 h)

**-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh (standard: 80 h)

#### b) (MASKING) Y SATURATION (CSR: F200 0028 h)

**-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh (standard: 80 h)

#### c) (MASKING) G SATURATON (CSR: F200 002C h)

**-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh (standard: 80 h)

**d) (MASKING) C SATURATION**  
**-Manual adjustment-**  
Setting value 820000xx h

**(CSR: F200 0030 h)**

xx: 00hto FFh (standard: 80 h)

**e) (MASKING) B SATURATION**  
**-Manual adjustment-**  
Setting value 820000xx h

**(CSR: F200 0034 h)**

xx: 00h to FFh (standard: 80 h)

**f) (MASKING) M SATURATION**  
**-Manual adjustment-**  
Setting value 820000xx h

**(CSR: F200 0038 h)**

xx: 00h to FFh (standard: 80 h)

**g) (MASKING) R HUE**  
**-Manual adjustment-**  
Setting value 820000xx h

**(CSR: F200 003C h)**

xx: 00hto FFh (standard: 80 h)

**h) (MASKING) Y HUE**  
**-Manual adjustment-**  
Setting value 820000xx h

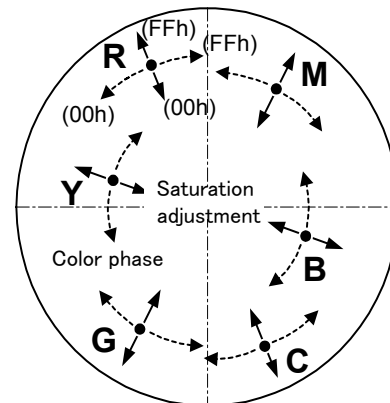
**(CSR: F200 0040 h)**

xx: 00h to FFh (standard: 80 h)

**i) (MASKING) G HUE**  
**-Manual adjustment-**  
Setting value 820000xx h

**(CSR: F200 0044 h)**

xx: 00h to FFh (standard: 80 h)

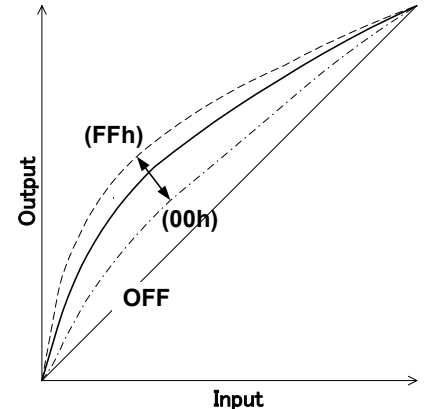


- j) (MASKING) C HUE** **(CSR: F200 0048 h)**  
 -Manual adjustment-  
 Setting value 820000xx h xx: 00h to FFh (standard: 80 h)
- k) (MASKING) B HUE** **(CSR: F200 004C h)**  
 -Manual adjustment-  
 Setting value 820000xx h xx: 00h to FFh (standard: 80 h)
- l) (MASKING) M HUE** **(CSR: F200 0050 h)**  
 -Manual adjustment-  
 Setting value 820000xx h xx: 00h to FFh (standard: 80 h)

**(2) GAMMA**

When set to Variable, total and RB gamma correction can be individually adjusted.

- a) (GAMMA) Total** **(CSR: F200 0058 h)**  
 - Manual adjustment -  
 Setting value 820000xx h xx: 00h to FFh
- b) (GAMMA) R ch** **(CSR: F200 0054 h)**  
 - Manual adjustment -  
 Setting value 820000xx h xx: 00h to FFh
- c) (GAMMA) B ch** **(CSR: F200 005C h)**  
 - Manual adjustment -  
 Setting value 820000xx h xx: 00h to FFh



### **(3) SHADING**

**(CSR:F200 0060 h)**

Color irregularity (white shading) likely to occur vertically on the screen due to lens characteristics is automatically compensated.

#### **Notes:**

- 1. When using the camera for the first time, or after replacing the lens, be sure to conduct auto shading adjustment.**
- 2. When used under fluorescent, mercury or other special types of lighting, flicker can impair white balance or shading adjustment. In such cases, adjust the shutter speed to reduce the flicker to the extent possible, then adjust white balance or shading.**

#### **-OFF-**

Setting value 80000000 h

Set white shading compensation to OFF.

#### **-Mode selection-**

Setting value 8200000x h x: 0- COLOR mode, 1- LUMINUNCE mode, 2- FLAT mode

- **COLOR** :Auto shading correction operates to minimize vertical color irregularity in the image. Use for non-uniformly lit general-purpose image material.
- **LUMINANCE** :Auto shading compensation operates to maintain uniform vertical level for the RGB video signals. Use with microscopes and other uniformly illuminated equipment.
- **FLAT** :Auto shading compensation operates to maintain uniform RGB video signal level for the full screen. Use with microscopes and other equipment when peripheral

shading is of concern.

If shading is grossly large or light variation random, compensation error can occur. Adjust uniformity of the light source.

**-One push (ASC)-**

Setting value 8600000x h x: Same as above.

Conduct by the following procedure.

1. Use auto lens iris or adjust manually to a suitable iris value.
2. Pickup a white image that completely fills the screen. Observe the object is evenly lighted from top to bottom.
3. Conduct white balance adjustment.
4. Conduct auto adjustment to correct for screen shading.

The image flashes during automatic adjustment.

**(4) WHITE GATE**

**(CSR: F200-0098 h)**

A portion of the screen is set aside as a sampling area for white balance adjustment. When a white or gray color is positioned at this window, optimum white balance can be adjusted in real time.

**-OFF-**

Setting value 80000000 h

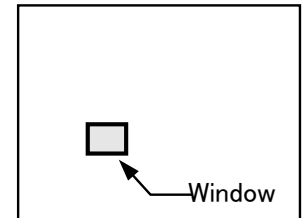
The video signal of the overall screen is detected for white balance control.

The window is not shown on the screen.

**-ON-**

Setting value 820xx0yy h xx: 00h to FFh ( H position)

yy: 00h to FFh ( V position)



The window is displayed on the screen during AUTO or ONE PUSH WHITE BALANCE operation for video signal detection.  
The window horizontal position setting is xx, and vertical position setting is yy.

**(5) BLACK BALANCE (CSR: F200 0064 h)**

Black balance is adjusted.

**-Manual adjustment-**

Setting value 820xx0yy h   xx: 00h to FFh (B black)  
   yy: 00h to FFh(R black)

**-AUTO ADJUST (One Push) (ABB)-**

Setting value 86000000 h  
Conduct with oblique light, such as with closed lens iris.

**2-2. Image quality related CSR**

**(1) SHARPNESS**

Object contours can be finely adjusted.

**a) (SHARPNESS) FREQ. (CSR: F200 00B0 h)**

Sharpness signal width can be set.

**-Manual adjustment-**

Setting value 8200000x h                   x: 0- LOW, 1- MID, 2- HIGH

- LOW: Width is thick.
- MID: Width set to standard.
- HIGH: Width set to fine.

**b) (SHARPNESS) LEVEL DEPENDENT. (CSR: F200 00B4 h)**

Sharpness is decreased at levels below a certain amount. Used mainly to avoid noise enhancement in dark signal components.

**-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh

Setting toward FFh reduces the sharpness level and expand the video signal level range.

**c) (SHARPNESS) CLISP (CSR: F200 00B8 h)**

Below a certain level, the sharpness signal is removed to avoid appearing as noise. But if the level is set too low, some blurring can occur in detailed components.

**-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh

Setting toward 00h reduces sharpness level; setting toward FFh increases sharpness level.

**d) (SHARPNESS) H/V BALANCE (CSR: F200 00BC h)**

Balance setting for horizontal and vertical sharpness level.

**-Manual adjustment-**

Setting value 820000xx h                      xx: 00h to FFh

Setting toward 00h reduces vertical sharpness level; setting toward FFh reduces horizontal sharpness level.

**e) (SHARPNESS) COLOR DTL Ch1 (CSR: F200 00C0 h)**

Color detail can be adjusted in the range of the color phase sharpness level setting.

The color phase can be set in different ranges for channels 1 and 2. The color detail channel 1 width/level can be set in any combination. Select channel 1 or 2, then set the color phase for adjusting detail.

**-OFF-**

Setting value 80000000 h

Color detail function is set to OFF.

**-ON (Manual adjustment)-**

Setting value 82000xyy h                      x: 0- R, Y- 1, 2- G, 3- C, 4- B, 5- M (phase)

yy: 00h to FFh ( phase(fine) )

Select 6 color phases from x values and then fine adjust with yy.

**-One Push (AUTO SETUP)-**

Setting value 86000000 h

The currently displayed color phases are automatically set by **AUTO SETUP**.

**f) (SHARPNESS) COLOR DTL Ch1 WIDTH/LEVEL (CSR: F200 00C4 h)**

The effective phase range and sharpness level can be adjusted.

**-Manual adjustment-**

Setting value 820xx0yy h                      xx: 00h to FFh (Width)

yy: 00h to FFh (Level)

Set color phase range with xx value. Reduce range toward 00h; increase range toward FFh. Select



range with Phase and position at color phase center to set.

Set sharpness level in range set by yy. Reduce sharpness toward 00h for a soft image. Increase sharpness toward FFh for a stark image. Channels 1 and 2 can be set independently.

**g) (SHARPNESS) COLOR DTL Ch2 (CSR: F200 00C8 h)**

Same function as COLOR DTL Ch1 (F200-00C0). (Ch 1 and 2 can be used as independent functions.)

**h) (SHARPNESS) COLOR DTL Ch2 WIDTH/LEVEL (CSR: F200 00CC h)**

Same function as COLOR DTL Ch1 (F200-00C4). (Ch 1 and 2 can be used as independent functions.)

**(2) KNEE (CSR: F200 00D4 h)**

Image high luminosity component is compressed (knee corrected) reducing gradation in high luminosity images.

**-OFF-**

Setting value 80000000 h

**-Manual adjustment-**

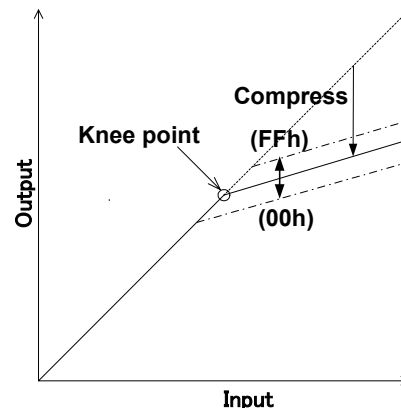
Setting value 820000xx h                      xx: 00h to FFh

Image compression level (knee point) decreases toward 00h and increases toward FFh.

**-AUTO-**

Setting value 83000000h

The auto setting increases the light amount and the knee point is automatically adjusted to compensate.



### (3) DNR (Digital Noise Reduction) (CSR: F200 00A0 h)

Improve S/N by digital noise reduction.

#### -OFF-

Setting value 80000000 h

#### -ON-

Setting value 8200000x h x: 1- MODE1, 2- MODE2

Although MODE 2 provides greater noise reduction, there is some sacrifice in resolution.

## 2-3. Image level related CSR

### (1) (A.E) PEAK/AVERAGE (CSR: F200 0070 h)

Sets PEAK or AVERAGE signal level detection for the **AUTO EXPOSURE** function.

#### -Manual adjustment-

Setting value 8200000x h x: 0- 0/100, 1- 15/18, 2- 25/75, 3- 50/50

Set auto level control for Peak or Average in 4 steps of 50/50, 15/85, 25/75, or 0/100. At high Average setting, background may be difficult to see in picture bright components. Increasing the Peak setting may render spotlighted components easier to see.

### (2) (A.E) SPEED (CSR: F200 0074 h)

AGC and AES response speed

#### -Manual adjustment

Setting value 8200000x h x: 0- SLOW, 1- MID, 2- FAST

- SLOW : Scene brightness variation rate is sufficiently slow to allow stable observing of detail.  
Allows a stable image when a strong light source enters the scene.
- STANDARD : Standard setting.
- FAST : Scene brightness variation rate is too rapid to stable use of effects such as

microscope variable magnification.

**(3) (A.E) GATE**

**(CSR: F200 0078 h)**

AUTO EXPOSURE signal detect area (8 x 8) can be set as desired.

**-OFF-**

Setting value 80000000 h

The screen overall video signal is detected for **AUTO EXPOSURE** control.

**-ON-**

Setting value 82000000 h

GATE for detecting the **AUTO EXPOSURE** video signal is set in lines 1-2 to 7-8. The area is not shown on the screen.

**a) (A.E) GATE line1-2**

**(CSR: F200 007C h)**

**-Manual adjustment-**

Setting value 820xx0yy h

xx: LINE 1 ON/OFF data

yy: LINE 2 ON/OFF bit map data

**b) (A.E) GATE line3-4**

**(CSR: F200 0080 h)**

**-Manual adjustment-**

Setting value 820xx0yy h

xx: LINE 3 ON/OFF data

yy: LINE 4 ON/OFF data

**c) (A.E) GATE line5-6**

**(CSR: F200 0084 h)**

**-Manual adjustment-**

Setting value 820xx0yy h

xx: LINE 5 ON/OFF data

yy: LINE 6 ON/OFF data

d) (A.E) GATE line7-8

(CSR: F200 0088 h)

-Manual adjustment-

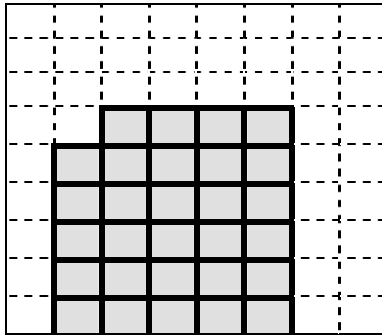
Setting value 820xx0yy h

xx: LINE 7 ON/OFF bit map data

yy: LINE 8 ON/OFF bit map data

(A.E) GATE line1-2 to line7-8 setting examples

Screen detect areas



Setting values corresponding to detect areas

Detect area (ON): 1 Non-detect area (OFF): 0

	7	6	5	4	3	2	1	0
GATE line1-2 xx values	0	0	0	0	0	0	0	0
GATE line1-2 yy values	0	0	0	0	0	0	0	0
GATE line3-4 xx values	0	0	0	0	0	0	0	0
GATE line3-4 yy values	0	0	1	1	1	1	0	0
GATE line5-6 xx values	0	1	1	1	1	1	0	0
GATE line5-6 yy values	0	1	1	1	1	1	0	0
GATE line7-8 xx values	0	1	1	1	1	1	0	0
GATE line7-8 yy values	0	1	1	1	1	1	0	0

Values for setting the above map detection area

(A.E) GATE line1-2: 82 00 00 00 h

(A.E) GATE line3-4: 82 00 00 3C h

(A.E) GATE line5-6: 82 07 C0 7C h

(A.E) GATE line7-8: 82 07 C0 7C h

## 2-4. CSR related to other functions

### (1) FLASH

(CSR: F200 0018 h)

Adjusts flash signal timing for mode 0 trigger operation.

#### -OFF-

Setting value 80000000h

Flash signal output absent.

#### -Manual adjustment-

Setting value 8200xyyy h x: 0-NARROW, 1- MIDDLE, 2- WIDE (pulse width)  
yyy: 000h to FFFh ( START)

See flash signal pulse width and timing chart on page 41.

### (2) BAR

(CSR: F200 00DC h)

Set to ON for Color Bars.

#### -OFF-

Setting value 80000000 h

#### -ON-

Setting value 82000000 h

### (3) NEGA

(CSR: F200 00E0 h)

On setting produces negative image.

#### -OFF-

Setting value 80000000 h

**-ON-**

Setting value 82000000 h

**(4) GL IN 75 ohm**

**(CSR: F200 00E4 h)**

Impedance changes over of input to the GL signal.

**-OFF( High Z)-**

Setting value 80000000 h

**-ON (75 ohm)-**

Setting value 82000000 h

**(5) H PHASE**

**(CSR: F200 00E8 h)**

Horizontal phase can be adjusted.

**-Manual adjustment-**

Setting value 820000xx h

xx: 00h to FFh

See setting range on page 42 “External sync timing”.

**(6) PIXEL CONCEALMENT**

**(CSR: F200 00F0 h)**

Sets pixel concealment on/off.

**-OFF-**

Setting value 80000000 h

**-ON-**

Setting value 82000000 h

**(7) FOCUS**

Setting register for focus data output.

**a) FOCUS GATE (SIZE)**

**(CSR: F200 00F4 h)**

Setting for focus data output area size.

**-ON-**

Setting value 820xx0yyh

xx: 00h to FFh (H size)

yy: 00h to FFh (V size)

**b) FOCUS GATE (POSITION)**

**(CSR: F200 00F8 h)**

Setting for focus data output area position.

**-ON-**

Setting value 820xx0yy h

xx: 00h to FFh (H position)

yy: 00h to FFh (V position)

**c) FOCUS DETECTION**

**(CSR: F200 00FC h) (read only)**

Return focus data.

**-DATA-**

00000000 h(MIN) to FFFFFFFF h(MAX)

**(8) INDICATOR**

**(CSR: F200 0100 h)**

Each type of indicator is displayed.

**-OFF-**

Setting value 80000000 h

**-ON-**

Setting value 8200000x h

x: 1- display WHITE GATE, 2- display FOCUS GATE

## (9) AUTO SETUP STATE

(CSR: F200 01004 h) (read only)

Resulting data of **One Push Auto White Balance (AWB)**, **One push Auto BLACK Balance (ABB)**, **One push Auto Shading (ASC)** and **One Push (Color DTL Auto Setup)** are shown.

**-DATA-**

000xyzzh

x: 0- NON, 1- WHITE, 2- BLACK, 3- SHAD, 4- DTL

yy: Progress condition 00h- 0% , FF- 100%

zz: Result           00h           - Normal end

FFh           - under adjustment (busy)

11h to 26h - Error end

### **Result codes:    Procedure**

11h:   Turn off the color bar

12h:   (WHITE BALANCE) change to Manual

13h:   Increase the intensity of illumination, turn lens iris to ward open direction, or increase the gain to provide a proper video level.

14h:   Decrease the intensity of illumination, turn lens iris toward closed direction, or decrease the gain to provide a proper video level.

15h:   The color temperature is too high, making it impossible to reach the optimum value in adjustment. (If there is no problem in practical application, use the camera under the current condition.)



Add a filter to the lens or illumination to decrease the color temperature.

- 16h: The color temperature is too low, making it impossible to reach the optimum value. (If there is no problem in practical application, use the camera under the current condition.) Add a filter to the lens or illumination to increase the color temperature.
- 18h: Carry out auto setup again. If this message appears in repeated attempts, it is necessary to inspect the inside of the camera. In this case, notify your local Hitachi Denshi sales agent or Hitachi Denshi service office
- 1Fh: The color saturation is too low, making it impossible to reach the optimum value
- 24h: Release the long shutter mode.
- 25h: Release the external trigger mode.
- 26h: Change a frame rate to the one under 30fps (HV-F22F only)

# Specification

	<b>HV-F31F</b>	<b>HV-F22F</b>
1) Optical system	1/3-inch, F2.2 prism	1/2-inch, F1.6 prism
2) Imaging system	R, G, B	3CCD
3) Picture elements	Corresponding to 1/3-inch Interline transfer CCD (with microlenses)	Corresponding to 1/2-inch interline transfer CCD (with microlenses)
Total pixels	1077 (H) × 788 (V)	1392 (H) × 1050 (V)
Effective pixels	1024 (H) × 768 (V)	1360 (H) × 1024 (V)
Pixel size	4.65μm (H) × 4.65μm (V)	4.65μm (H) × 4.65μm (V)
Effective image area	4.77 (H) × 3.58 (V) mm	6.33 (H) × 4.77 (V) mm
4) Scanning system	Progressive scan	
5) Sync system	Internal/external (HD/VD auto selection)	
6) Standard sensitivity	2000 lx, F5.6	2000lx, F8 (1/30 second shutter)
7) Geometric distortion	Full screen 0% (not including lens characteristics)	
8) Registration	Full screen 0.05% (not including lens characteristics)	
9) Vertical contour compensation	2H	
10) Lens mount	C mount (falngeback 17.526 mm in air)	
11) Sensitivity selection	AUTO EXPOSURE: 0 to 12 dB GAIN: 0 to 12 dB	
12) Sharpness control	Sharpness level and width and others.	

- |                          |             |  |
|--------------------------|-------------|--|
| 13) CCD drive functions  |             |  |
| Shutter                  |             | Approx. 4 to 1/100,000 second  |
| AUTO EXPOSURE            |             | OFF to Approx. 1/100,000 second  |
| 14) Color bar            |             | Full   |
| 15) Power supply voltage |             | 12 V rated<br>(Stable operation at 10.5 to 15 VDC : ripple and noise absent) |
| 16) Power consumption    | Approx. 7 W | Approx. 7.5 W  |
| 17) Dimensions           |             | 65 (W) × 65 (H) × 130 (D) mm   |
| 18) Mass                 |             | Approx. 600 g (not including lens)   |
| 19) Ambient temperature  |             | Operating     -0 to +40 °C<br>Storage       -20 to +60 °C                    |

# Input/Output Signals

## 1. IEEE1394 interface (IEEE1394 connector)

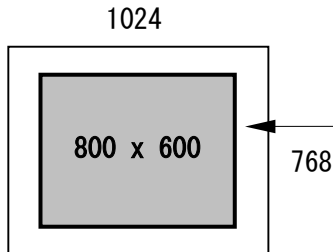
1) Standard rating

1394-based Digital Camera Specification Ver.1.30 IIDC protocol

2) Transmit format

### ● HV-F31F

Camera Mode		Frame Rate	bit/pixel	bit/ch	Format	Mode(ID)
XGA (1024 x 768)	YUV	15	16	8	1	3
XGA (1024 x 768)	RGB	7.5	24	8	1	4
SVGA (800 x 600) <sup>NOTE 1</sup>	YUV	30	16	8	1	0
SVGA (800 x 600) <sup>NOTE 1</sup>	RGB	15	24	8	1	1
XGA (1024 x 768)	RGB	3.3	48	10	7	6

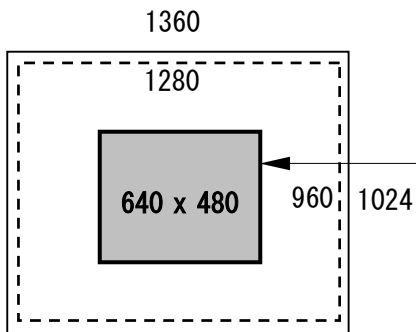


### NOTE 1:

In the SVGA output format, the full image data from the center SVGA range are transmitted.

● HV-F22F

Camera Mode		Frame Rate	bit/pixel	bit/ch	Format	Mode(ID)
SXGA (1280 x 960)	YUV	7.5	16	8	2	0
SXGA (1280 x 960)	RGB	7.5	24	8	2	1
VGA (640 x 480) <sup>NOTE 2</sup>	YUV	30	16	8	0	3
VGA (640 x 480) <sup>NOTE 2</sup>	RGB	30	24	8	0	4
SXGA (1360 x 1024)	YUV	7.5	16	8	7	2
SXGA (1360 x 1024)	RGB	7.5	24	8	7	4
SXGA (1360 x 1024)	RGB	1.875	48	10	7	6



**NOTE 2:**

In the VGA output format, the full image data from the center VGA range are transmitted. In this mode, use to adjust the focus or check the moving picture only so that white shading compensation and pixel concealment function do not operate.

3) Transmit speed  
400Mbps

## 2. DC IN/SYNC input and output (DC IN/SYNC connector)

1) External HD/VD signal input

HD/VD: 2 to 5 Vp-p, Negative

2) External trigger signal input (Photo-coupler)

low 0 Vdc, high 24 Vdc

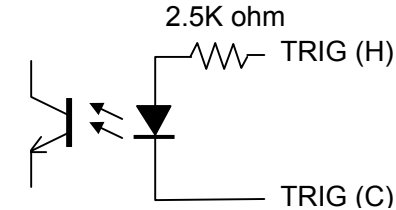
3) Flash signal output

low 0 Vdc, high 5 Vdc

4) Power supply input

12 V rated

(Stable operation at 10.5 to 15 VDC (ripple and noise absent))



**Photo-coupler input part**

## 3. External trigger input (TRIG IN connector)

low 0 Vdc, high 2 to 5Vdc

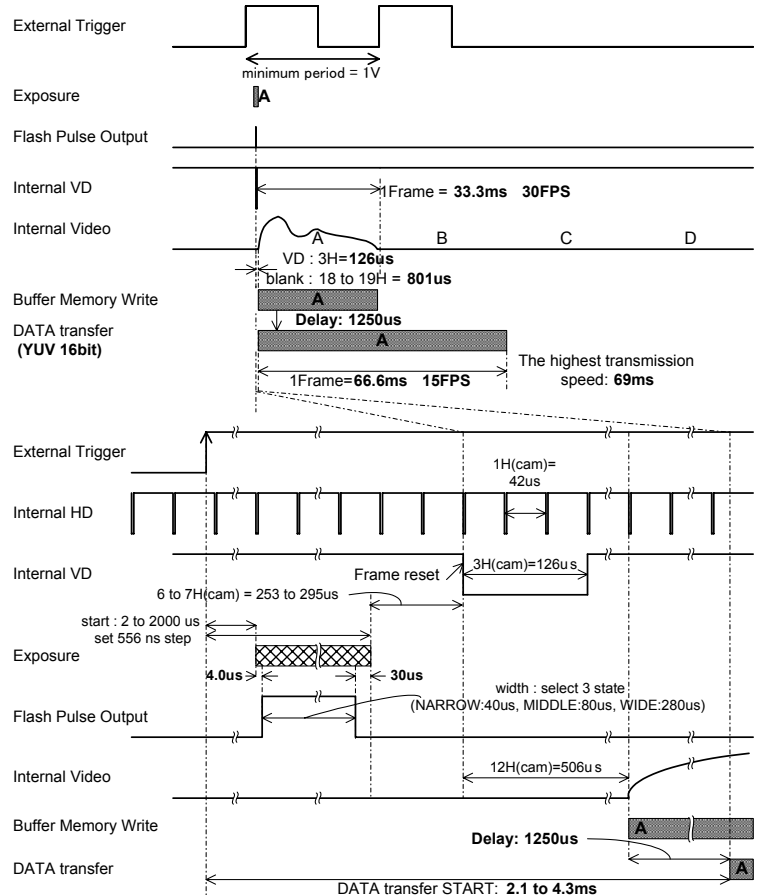
# Trigger operation and timing chart

External trigger refer to a function for picking up rapidly moving objects by applying a trigger pulse input. It is possible to pick up an image with various timing.

## 1. HV-F31F

### (1) External trigger operating mode: Mode 0

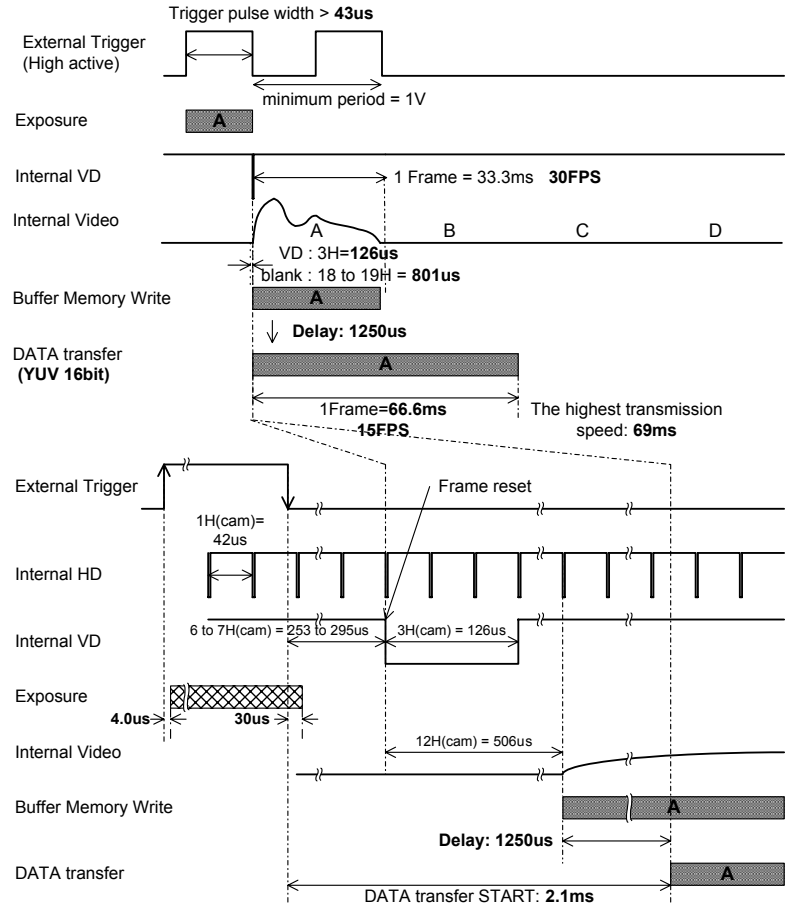
When external trigger signal is high active, light pulse begins at the rising edge of the trigger signal and ends at the falling edge. At the trigger signal falling edge, the internal VD signal is reset and the video data are transmitted.



(2) External trigger operating mode: Mode 1

When external trigger signal is high, after the trigger signal rise, the flash signal start/end can be set to determine the flash time.

At the flash signal falling edge, the internal VD signal is reset and the video data are transmitted.

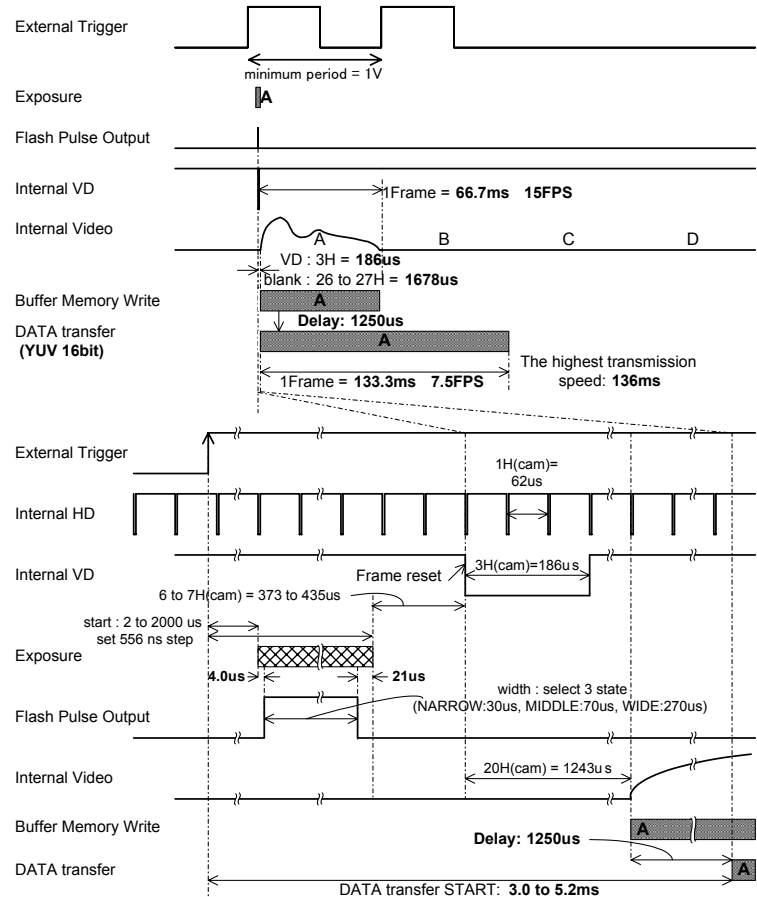




## 2. HV-F22F

### (1) External trigger operating mode: Mode 0

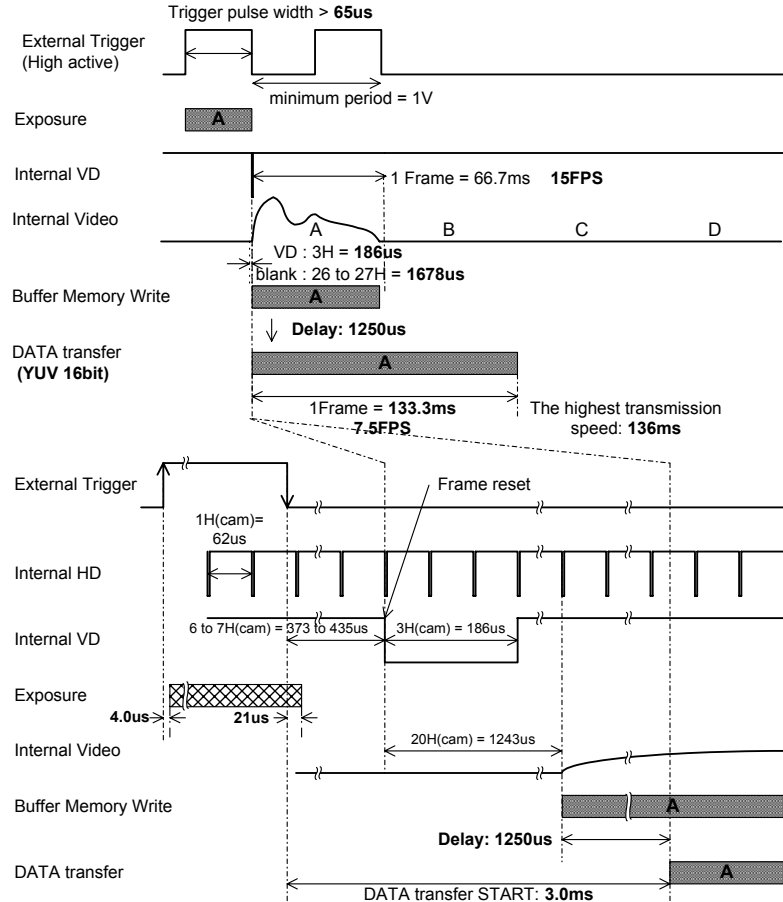
When external trigger signal is high active, light pulse begins at the rising edge of the trigger signal and ends at the falling edge. At the trigger signal falling edge, the internal VD signal is reset and the video data are transmitted.



(2) External trigger operating mode: Mode 1

When external trigger signal is high active, after the trigger signal rise, the flash signal start/end can be set to determine the flash time.

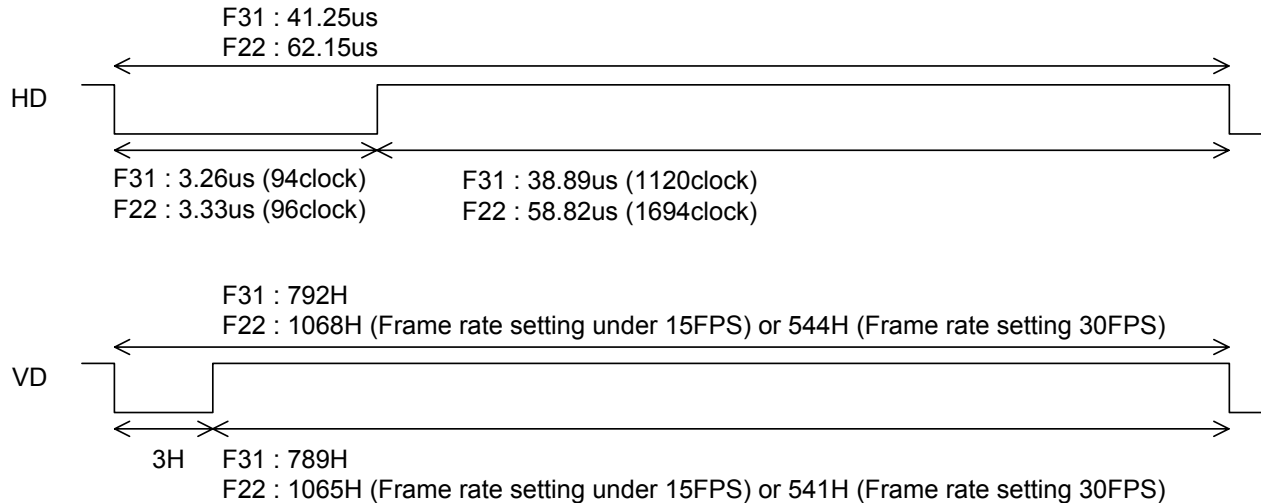
At the flash signal falling edge, the internal VD signal is reset and the video data are transmitted.



# External sync timing

Please input the sync pulse of following specification, in the case that camera synchronization locks the external synchronization.

Clock : 28.8 MHz ( $\pm 0.005\%$ )



# Dimensions

