Ikegami

HD
High Definition

The Latest Technology
Multi-format Full Digital HDTV Camera System

HDK-79EC

HDK-79EC2 Type

**Leading-edge CMOS sensor technology,
featured in several innovative models,
pushes the state-of-the-art in End to End Digital,
Multi-format HD Cameras.**

State-of-the-Art, HDTV Native multi-format CMOS camera

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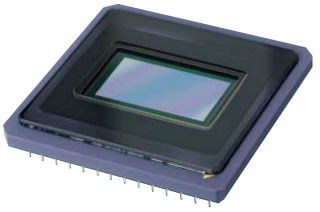
HDK-79EC2 Type

The HDK-79EC achieves outstanding performance to meet the critical needs of today and tomorrow, with exceptional functionality and superior reliability.
For extraordinary flexibility, the HDK-79EC is designed as a docking style camera head, allowing configuration as a fiber, triax, or self-contained camera.
The SE-79D, System Expander, adds the flexibility to rapidly change between full featured studio camera, and shoulder or jib mounted portable camera.

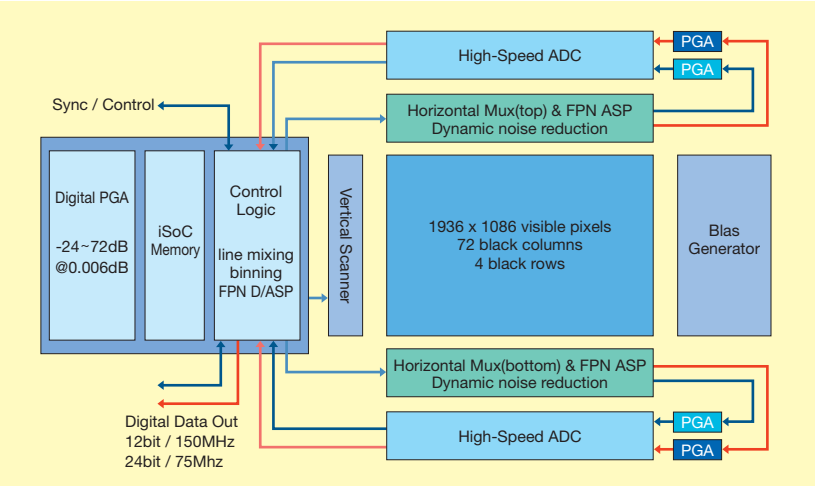
Revolutionary 2/3-inch 2.5 Mega-pixel CMOS sensors

Advanced CMOS sensors are employed to achieve superb picture quality. CMOS sensors have wide dynamic range and in principle, no smear since electric charges are not shifted throughout the imager which is the cause of vertical smear in CCDs. Instead each pixel of the CMOS sensor has it's own amplifier (which changes electric charges to voltage signals). So it performs signal amplification on a pixel basis.



The CMOS sensors can be readout in either progressive or interlace, supporting native multi-format operation. They also have the capability of high speed operation for slow motion and other special applications (the HS model uses the same standard CMOS sensors, so camera upgrade is practical).
The Advanced CMOS sensors used in the HDK-79EC include system-on-chip technology, so not just imaging, but also a range of support circuity is included within the sensor itself. The result is a flexible sensor in a small package with low power consumption.
The output of the sensors is digital, providing for the first time, a true end-to-end digital solution.

CMOS Block Diagram System-on-Chip

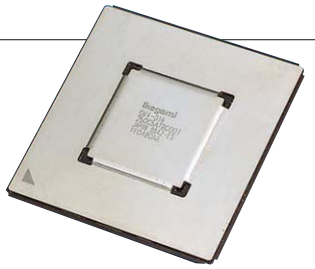


Ikegami is the world's leading supplier of state-of-the-art broadcast and professional video production equipment.
The HDK-79EC adopts leading-edge CMOS sensor technology as an industiry first, providing supreme picture quality and multi-format HD performance in this Full Digital camera system configurable for portable, field, or studio use.

- **Incorporates Ikegami's sophisticated Chip C4 ASIC video processing technology**
- **Revolutionary 2/3" 2.5 Mega-pixel CMOS (Complementary Metal Oxide Semiconductor) imaging sensors**
- **Multi-format capability, Multiple application use**
- **Enhanced operational flexibility with a wide variety of peripherals.**

Chip C4

Ikegami's video processing know how greatly influenced the development of Chip C4 ASIC (Application Specific Integrated Circuit). Chip C4 processes the digital video output from the CMOS sensors including Knee, gamma, color and DTL correction. For example, various DTL functions, Soft DTL, Skin tone DTL, horizontal / vertical / diagonal DTL, and DTL boost frequency are controlled in Chip C4 with up to 38-bit internal quantization.



To improve the HDK-79EC's ability to handle the high contrast scenes frequently encountered in field production, several new functions are programmed into Chip C4. A multiple break point Smooth Knee give progressivly more level compression as the highlight level increases. The result is more natural reproduction of modest highlights while maintaining the broad dynamic to handle significant highlights. Super Color Knee and Knee Detail are added to improve color and sharpness in the knee process. Zoom tracking Detail helps compensate for loss of MTF shooting with long telephoto lenses.

Sophisticated features made possible with digital technologies

FINE DTL function

By expanding the small edge in the low constrast object and compressing the edge component in the high contrast object, the impression for the glare of picture with too much edge is reduced and the natural image, which is more visual for human being, can be obtained.

Six-Vector Color Corrector + Two-Axis Custom Color

Includes a color correction function that enables hue and saturation to be adjusted for each of the six primary colors (R, G, B, Cy, Y, Mg), plus another function to make color correction of two user-selected colors of the subject. Color correction before Gamma Circuit provides more true color reproduction.

Enhanced Digital DTL

Improved visual reproduction of subjects such as texture and sheen, and richer reproduction of details in skin tone and in dark backgrounds is realized.

Super KNEE

The Super Color Knee system maintains color saturation without changing the hue of the highlighted parts and provides natural color reproduction under high luminance conditions.

KNEE DTL function

KNEE DETAIL function provides better expression in highlight scene, improving on previous Knee Aperture. Vertical and Horizontal contour corrections are independently made to the highlight video where the KNEE is processed.
(Supported by OCP-200/MCP-150/MCP-200/RCP-50B)

Menu Preset function

All menu items including Level and Control settings can be preset and easily recalled from the control panel. It is also easy to reset to factory settings. Preset for 3 MATRICES can be set. The MATRIX settings can be preset for different lighting, and then selected by the control panel.
(Supported by OCP-200/MCP-150/MCP-200/RCP-50B)

Master FLARE

A Master FLARE function enables one adjustment to control the overall level of FLARE while maintaining the tracking of the R/G/B channels. This feature makes it possible to control flare during operation since the color balance is never off.
(Supported by OCP-200/MCP-150/MCP-200/RCP-50B)

Clear VF DTL function

This function makes a difference in the edging of the image exclusively in the viewfinder, to make the precise point of focus easier to find, and to make it easier for the cameraperson to focus.

Full digital processing Camera Control Unit, the full size CCU-890

The full size CCU-890 is designed for use of an optical fiber connection between the HDK-cameras, ensuring high-quality signal transmission and long cable runs, up to 3000m for Studio camera or Portable camera with System Expander. Both HDTV and SDTV formats are supported simultaneously in both digital and analog form with a wide range of built-in interfaces. The CCU-890 also features embedded audio in the SDI output signals, as well as, frame synchronizer for return video input signals. Furthermore, the CCU-890 supports dual link with simple board exchange for high speed operation.
(note: camera head must also support for dual link)

CCU-890 front

CCU-890 rear

Space-Saving Design

Suitable for small-sized HD vans and rental / flight-pack systems A half-rack base station BS-89 is available, permitting full SMPTE fiber cable extention with a compact base station. It supports multi-format HDTV as standard, SDTV format available with optional boards.
The BS-89 supports camera cable length up to 1000m for the Portable camera with System Expander.

BS-89 front


BS-89 rear

State-of the-Art, expanding HDTV System accessories

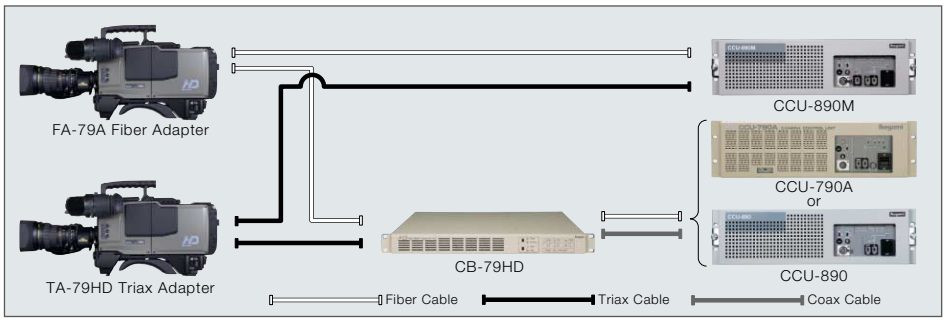
Triax Adapter System

An optional triax board set is available for the new CCU-890M, providing built-in support for either triax or fiber camera cable with simple front panel selection. The result is a highly flexible camera system which can be setup for either cable type in a matter of minutes.
The CB-79HD is a 1RU converter offering the same flexibility when used with other CCUs.

CCU-890M + TA-890CCU(Option)

Transmission Distance

Up to 850m (2,800ft.)	by 8.8mm	diameter triax / Fujikura
Up to 1,550m (5,100ft.)	by 14.5mm	diameter triax / Fujikura
Up to 500m (1,600ft.)	by 9.2mm	diameter triax / Belden type 9267
Up to 1,000m (3,300ft.)	by 13.2mm	diameter triax / Belden type 9232



TA-79HD Triax Adaptor (Docking type)

High Performance Viewfinders

For the HDK-79EC, a 2-inch 16:9 high definition VF for portable application is available. Employing a magnifying eyepiece in the 2-inch VF, visibility is further improved. In addition, a 9-inch LCD color viewfinder is available as an option.

SE-79D System Expander

The SE-79D System Expander enables the use of the 9-inch viewfinder and full studio lenses with the HDK-79EC, converting the portable camera into a full facility studio camera. Installation of the camera into the SE-79D is very easy, and conversion back to portable configuration is quick for maximum operating flexibility.

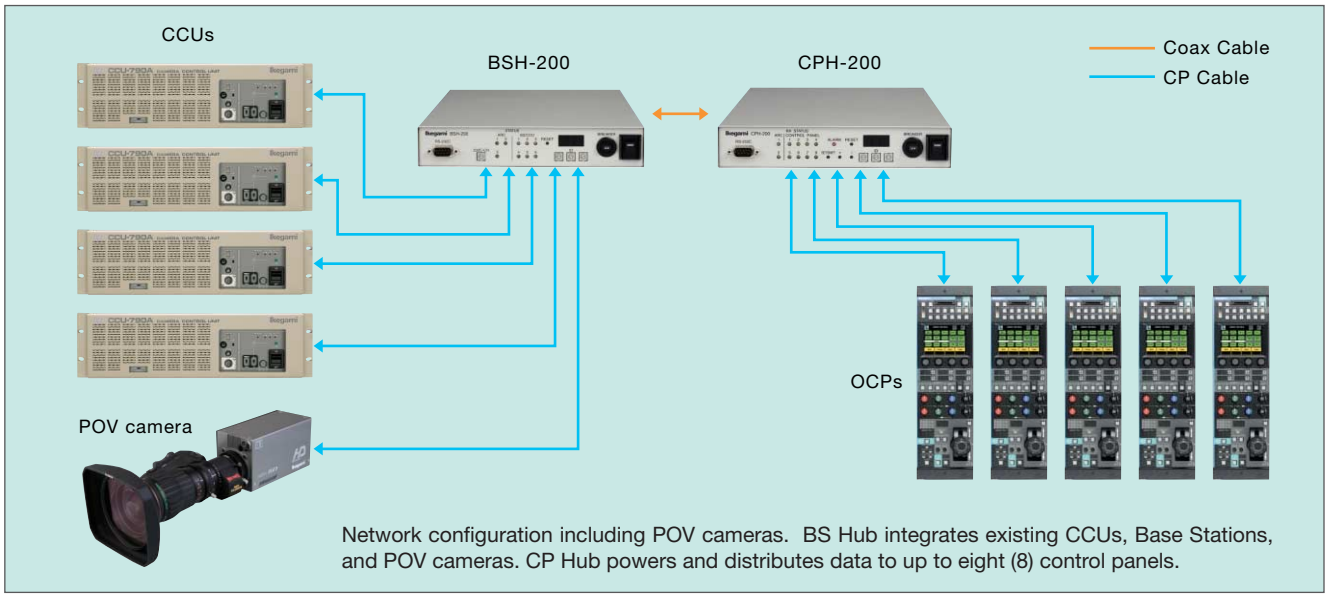
High Speed model

HDK-79EC/HS

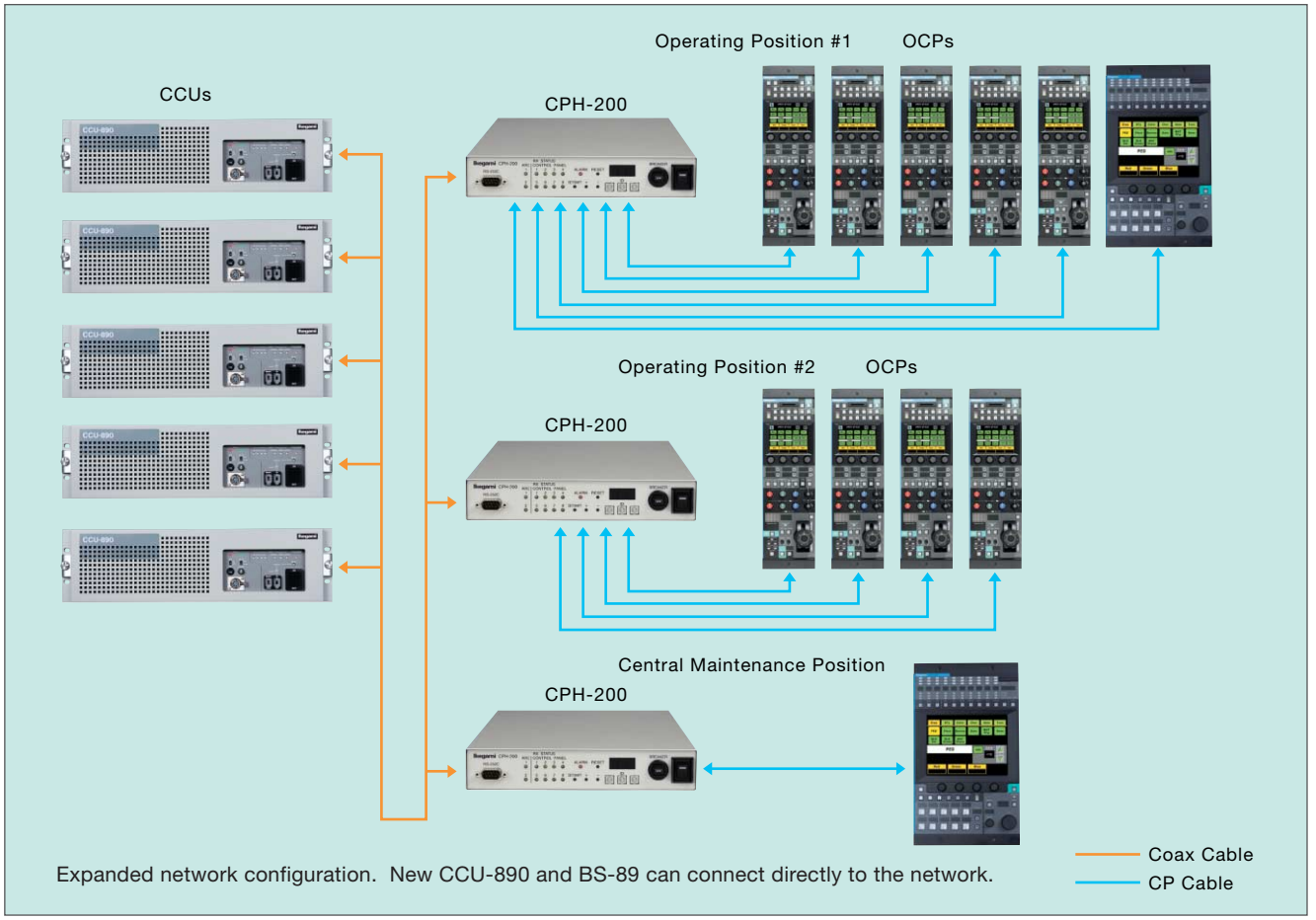
Exploiting new CMOS technology, the HDK-79EC/HS offers 1080/60p and 720/120p High Speed sensor readout for special applications, including Super Slow Motion.
The newly developed CMOS sensors include dual outputs as standard, enabling high performance and high speed 1080/60p, 720/120p, and 1080/120i formats. The HDK-79EC, FA-79A, and CCU-890 can be ordered in the optional HS-configuration, and in this configuration the camera will support both standard and high speed HD formats, further increasing flexibility and future proof protection.

Cutting-edge, Network based Control Panel System

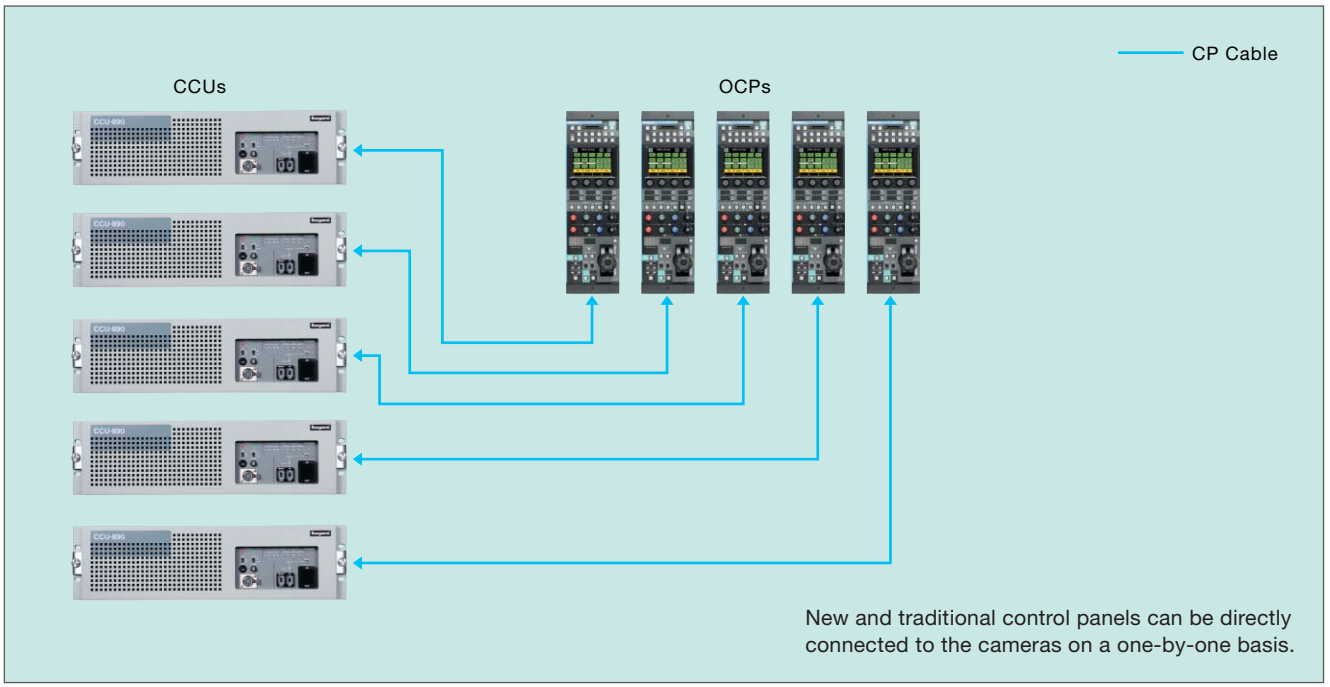
The OCP-200 / MCP-200 is a new Network based control panel system offered as an alternate to the traditional Ikegami style control panels. The Network system allows any OCP-200 to control any camera with assignment set at the OCP itself. System wiring is simplified with control of up to 96 cameras via a single coax cable between CCU locations and video control locations. The OCP-200 and MCP-200 include touch screen LCDs. The depth-of-control of the OCP-200 can be selected from basic to complete to fit the customers' operating discipline. Conventional one by one camera control connection is also available.



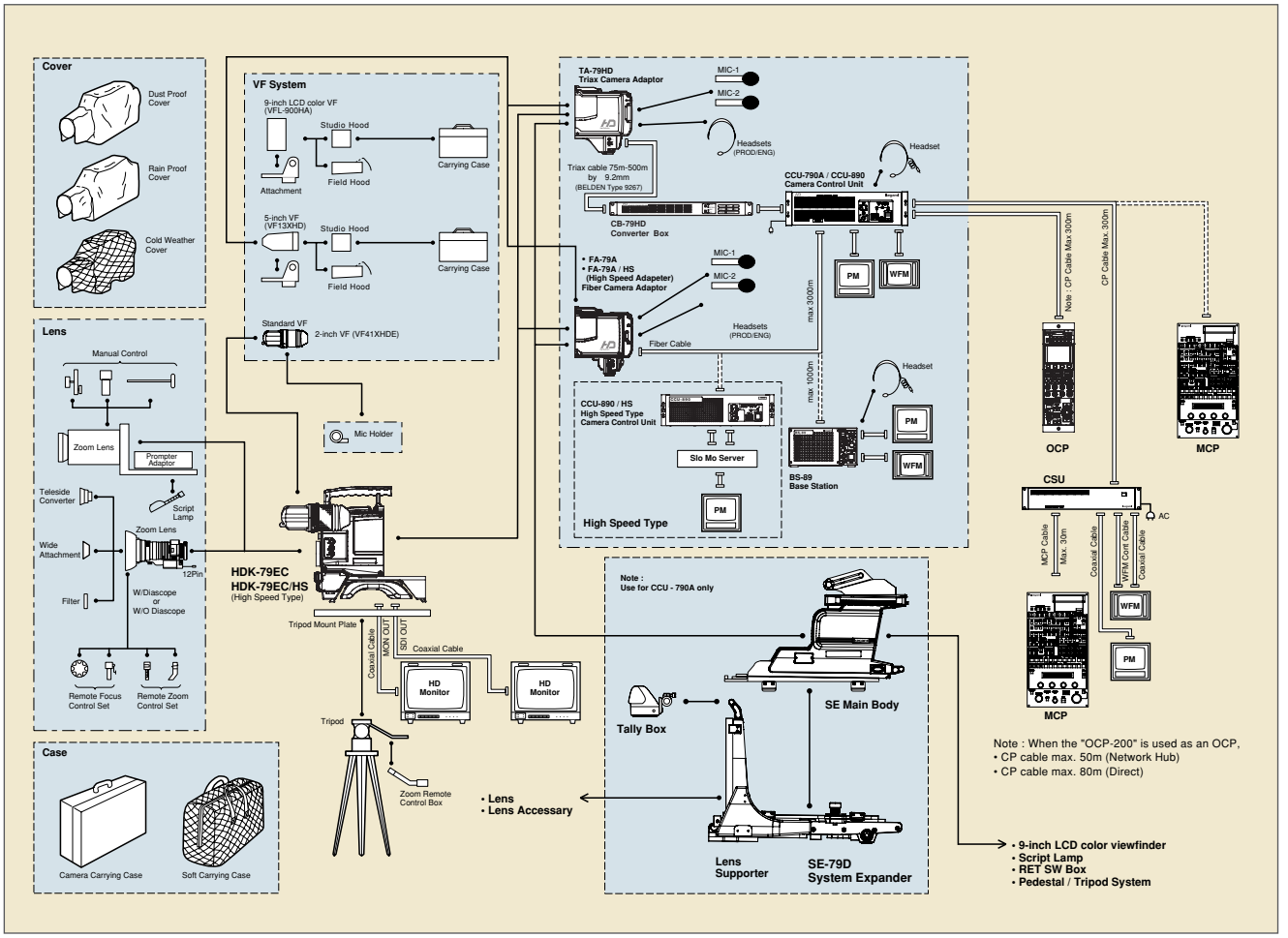
Network configuration including POV cameras. BS Hub integrates existing CCUs, Base Stations, and POV cameras. CP Hub powers and distributes data to up to eight (8) control panels.



Expanded network configuration. New CCU-890 and BS-89 can connect directly to the network.



System Diagram



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HDK-79EC

HDK-79EC2 Type

Ratings

- Image sensor ····· 2/3-inch 2,500,000-pixel CMOS
- Optical system ····· 2/3-inch, f1.4 prism
- Lens mount ····· BTA S-1005B (standard)
- Viewfinder ····· 2-inch B/W viewfinder (standard),
  5-inch B/W viewfinder (option) or
  9-inch color LCD viewfinder (option)
- Input signals
  - HDK-79EC/FA-79A
    - External SYNC signal ····· SYNC 0.6Vp-p ±6dB
    - Audio signal* ····· -60, -50, -40, -30, -20, -10, 0, +4dB 600Ω (2ch, balanced)
      (after selecting, variable 5dB available)
    - Intercom signal ····· 2ch (ENG/PROD) (Standard : XLR type)
  - CCU-890
    - [HDTV system (SMPTE274M and SMPTE292M)]
    - Genlock signal ····· PS 1.0Vp-p or Sync 0.6Vp-p ±6dB 75Ωbridged
    - Return video signal ····· HD-SDI : 75Ω, Single End 4ch
      VBS/D1 : 75Ω, bridged 2/4ch
    - Q-TV signal ····· VBS 1.0Vp-p 75Ω, Single End 2ch
    - Intercom/Tally
      - Intercom (ENG/PROD) ····· (4-wire or Clearcom or RTS)
      - 4-wire ····· 0dBm 600Ω 2ch
      - Clearcom ····· -15dBs 200Ω 2ch
      - RTS ····· 0dBm 200Ω 2ch
      - Tally ····· contact/voltage R, G 2ch
      - Program sound ····· 0dBs 600Ω 2ch
- Output signals
  - HDK-79EC
    - Video signals
    - MON HD-SDI ····· Monitor, VF or Return Select 1ch, 75Ω (BNC Connector)
    - Analog Monitor signal ····· Viewfinder Video 1ch, 75Ω (BNC connector)
  - FA-79A
    - HD SDI signal ····· Y, P_B, P_R 4:2:2 serial digital 1ch
      (BNC connector) (SMPTE292M)
      (2ch for HDK-79EC/HS High Speed version)
    - Q-TV signal ····· Analog signal 2ch, 75Ω (BNC connector)
      (1ch for HDK-79EC/HS High Speed version)
    - Intercom signal ····· 0dBs 2ch (ENG/PROD) (Standard: XLR type)
    - VTR signal ····· BTA S-1005B (Factory option)
  - CCU-890
    - RGB signal (HDTV/SDTV) (Option) ··· RGB or Y, P_B, P_R 75Ω 1ch
      (either HDTV output or NTSC output is selected)
    - HD SDI signal (SMPTE294M) ··· 75Ω 4ch
    - HD-WFM signal ····· HD-SDI 75Ω 2ch
    - HD-PM signal ····· PM-SDI 75Ω 2ch (MON can be selected)
    - Composite video signal ····· VBS 1.0Vp-p 75Ω 2ch
    - SD-SDI(D1) ····· (SMPTE259M) 270Mbit/s 0.8Vp-p 75Ω 2ch
    - SD-WFM signal (Option) ····· R,G,B,Y,ENC select 1.0Vp-p 75Ω
      or SDI 75Ω 2ch
    - SD-PM signal (Option) ····· R,G,B,Y,ENC select 1.0Vp-p 75Ω
      or SDI 75Ω 2ch
    - Audio Signal
      - Mic ····· 0dBm 600Ω 2ch
      - Digital audio ····· AES 3ID 1Vp-p 75Ω 1ch
        (In conformity with AES/EBU)
    - Intercom/Tally
      - Intercom (ENG/PROD) ····· (4-wire or Clearcom or RTS)
      - 4-wire ····· 0dBm 600Ω 2ch
      - Clearcom ····· -15dBs 200Ω 2ch
      - RTS ····· 0dBm 200Ω 2ch
- Filter ····· 1 2 3 4 5
  ND CAP 100% 25% 6.2% 1.6%
  A B C D E
  CC CROSS 3200K 4300K 6300K 8000K
- Electric color temperature ····· 5600K
- Ambient temperature ····· -20°C ~ +45°C (-4°F ~ +113°F)
  CCU-890 : 0°C ~ +45°C (+32°F ~ +112°F)
- Relative humidity ····· 30%~90% (Non-condensing)
- Operating voltage ····· +11~16VDC
- Weight
  - HDK-79EC ····· 5.7kg (12.57 lbs) (without lens)
  - CCU-890 ····· approx. 30kg (66.14 lbs)
- Dimensions
  - HDK-79EC ····· W107 X H232 X D375mm
    (W4.21 X H9.13 X D14.76 inches)
  - CCU-890 ····· W482.6 X H132.6 X D481mm
    (W19.00 X H5.22 X D18.94 inches)

Performance

- Sensitivity ····· F10(1080i/59.94 mode), F11(1080/50 mode)/2000 lx
- S/N
  - HDTV system ····· 56dB (Typical)
- Modulation depth
  - HDTV system ····· 45% or more 1080/59.94i at 27.5MHz
    40% or more 720/59.94p at 28.875MHz
    45% or more 1080/50i at 27.5MHz
    40% or more 720/50p at 28.875MHz
    45% or more 1080/24p at 27.5MHz
  - NTSC system ····· 90% or more (400 TV lines, 5MHz)
- Limiting resolution
  - HDTV system ····· 1000 TV lines (1080/59.94i, 1080/50i)
    700 TV lines (720/59.94p, 720/50p)
- Video frequency response (Base Station output)
  - Y output
    - Below 60Hz ····· Falling
    - 60Hz~30MHz ····· within 1.0dB
    - Over 30MHz ····· Falling
  - P_B, P_R output signal
    - Below 60Hz ····· Falling
    - 60Hz~15MHz ····· within 1.0dB
    - Over 15MHz ····· Falling
  - NTSC output signal (Ych 100kHz, output signal from external camera control equipment)
    - Below 60Hz ····· Falling
    - 60Hz~4.5MHz ····· within 0.5dB
    - 4.5MHz~8.0MHz ····· within 1.0dB
    - Over 8MHz ····· Falling
- Audio Frequency response (Base Station output)
  - Y output
    - Below 100Hz ····· Falling
    - 100Hz~10kHz ····· within 1.0dB
    - Over 10kHz ····· Falling
- Contour correction
  - Vertical ····· 5line
  - Horizontal ····· Boost frequency, 13MHz~24MHz (HDTV)
    Boost frequency, 2.7MHz~8.9MHz (SDTV)
- Gamma ····· OFF, 0.35, 0.4, 0.45
- Gain ····· -3dB, 0dB, +3dB, +6dB, +12dB (Standard)
- Power consumption
  - HDK-79EC ····· Camera Head only: 26W
    2-inch VF: 6W

Design and specifications are subject to change without notice.

H48F094-HI1 Printed in Japan

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