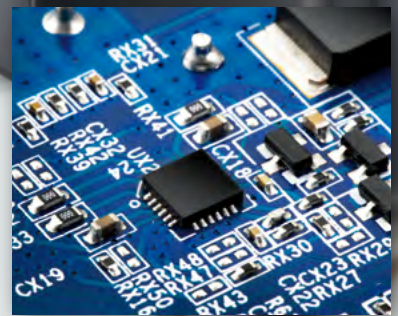


Panasonic
ideas for life



1MOS FULL HD MICRO CAMERA

CCU CONTROL UNIT GP-KH232CUE & GP-KH232CSE
COMPACT CAMERA HEAD GP-KH232HE

- 1/3-inch FullHD MOS chip
- Multi Format up to 1080p
- Brilliant Colour Reproduction
- Ultra Compact
- OEM



IT COULDN'T BE SMALLER

Panasonic has met the demands of count-less users with 1080p - genuine 16:9 high definition for micro cameras. For outstanding sharpness, impressively true colours and flicker-free images.



1 MOS HD MICRO CAMERA SYSTEM: GP-KH 232E SERIES

• HIGH RESOLUTION AND SENSITIVITY

You simply see more with HD technology. An extraordinary resolution of 900TV lines, a very good sensitivity and a high speed electronic light control provides clearer images in all sorts of possible ambient light conditions. These are properties that can be decisive in endoscopic, microscopic and point-of-view applications.

• MULTI VIDEO FORMATS

Beside the 1080p FULL HD mode for HDMI, the remote head camera also supports the HD formats 1080i and 720p as well as the SD formats 576p and 576i. Even the video frequency itself can be changed between 50Hz and 59.96Hz. To be backward compatible GP-KH232CUE got an S-Video output to support Standard Definition.

• COLOURS ON DEMAND

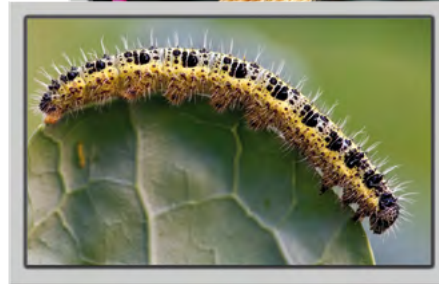
Panasonic's 1MOS HD micro camera feature individual colour range adjustment using a 16-axis colour matrix. This unique single colour enhancement without influencing other colours provides particularly brilliant colour reproduction in scientific or industrial solutions.



Original picture



Colour adaptation with 16-axis colour matrix



• DIGITAL VIDEO INTERFACES

In order to forward the high-resolution images without data loss to subsequent monitor and recorder devices the camera is equipped with a HDMI interface.

To support also long distance video transmission another control unit got also a digital HD-SDI interface. To be also compatible with the still commonly used analogue component standard the camera also provides a RGB/YPbPr terminal. And of cause all outputs are working simultaneously.

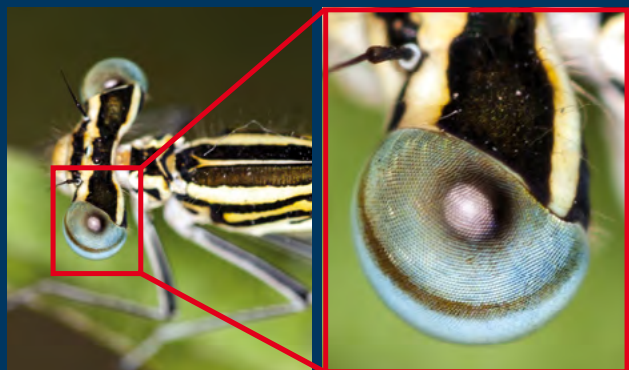
• EASE AND FLEXIBILITY OF OPERATION



By utilizing the user-friendly OSD on-screen menu our micro cameras can be controlled efficiently and easily. This means parameters can be changed quickly during operation. It is also extremely easy to save your own settings as presets for up to three different users. The same control is also possible remotely via RS232 and a GUI software. The OSD control of OEM components can also be adapted to customer specific needs.

• DIGITAL ZOOM

Get close in with the 2.5x continuous electronic zoom.



Even more miniaturized by using the MOS technology for the camera head no compromise has been made for the picture quality in terms of resolution, sensitivity and colour reproduction.

GP-KH232E SERIES 1MOS FULL HD MICRO CAMERA

FULL HD 1080p



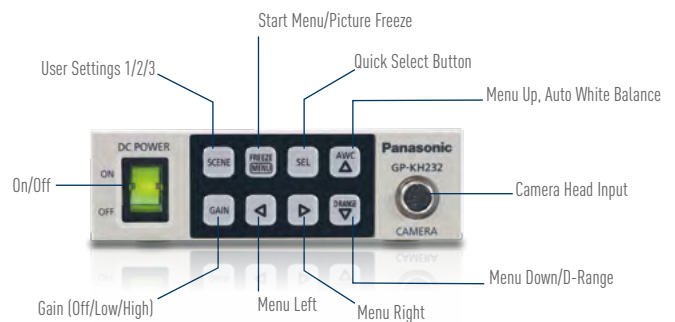
FEATURES

- 1/3" MOS head with 1920 x 1080 Pixel,
 - 900 TV Lines resolution and
 - Ultra compact size
- Multi video format camera (50Hz and 59.96Hz)
 - HD: 1080p (HDMI only), 1080i and 720p
 - SD: 576(480)p and 576(480)i
- Remote head cable with loss-free digital signal transmission up to 15m
- Picture enhancement functions
 - Frequency selectable Detail enhancement
 - Dynamic range enhancement
- Picture manipulation functions
 - Image mirror, flip and rotate
 - Electronic Zoom (max 2.5)
 - Still Picture
- Natural color settings (16-axis colour matrix)
- OEM components available

OVERVIEW OF CONTROLS AND CONNECTIONS

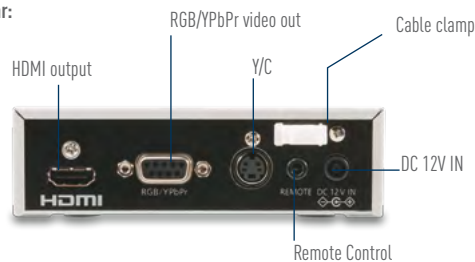
GP-KH232CUE/ GP-KH232CSE

Front:



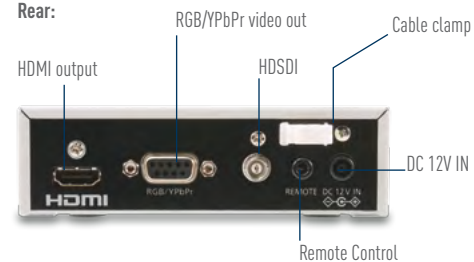
GP-KH232CUE

Rear:



GP-KH232CSE

Rear:



SYSTEM COMPONENTS



GP-KH232HE Remote camera head

- 1/3" type MOS with Full-HD Pixel
- C-Mount+Dimension app. 27 x 28 x 39 mm
- Sensitivity: 2000lx at F5.6



GP-KH232CUE CCU Control Unit

- Supports GP-KH232HM/HU head
- Output: HDMI(1080p) and RGB/YpPr, Y/C
- Dimension: app. 120 x 36 x 157 mm
- RS232 Control I/F



GP-KH232CSE CCU Control Unit

- Supports GP-KH232HM/HU head
- Output: HDMI, HDSDI and RGB/YpPr
- Dimension: app. 120 x 36 x 157 mm
- RS232 Control I/F (available from Oct. 2012)



GP-KC232 Signal Cable

- Industrial Grade with 20 Pin Hirose
- GP-KC23202/V 2m · GP-KC232M4 4m Length
- GP-KC23206/V 6m · GP-KC23215/V 15m Length



GP-KH232CB Control Board

- Supports GP-KH232HE/HU
- Output: YUV, HDMI, YpPr, Y/C, Video
- RS232C (3.3V) remote control
- Dimension: app. 104 x 139 x 10 mm



GP-KH232HU Remote Head Module

- 1/3" type MOS with Full-HD Pixel
- Flex cable connector
- Dimension: 25 x 23 x 19 mm



GP-KC232/100-58 Cable Components

- Non-assembled cable in black
- 100 m with 5.8 mm diameter
- Suitable for medical use



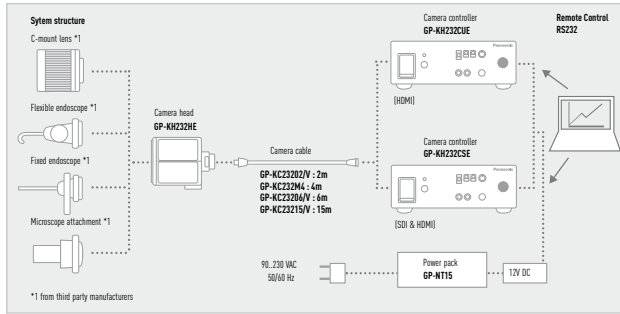
GP-NT15 Power Supply

- 90..240V AC(50/60Hz) and 12V DC
- with EIAJ RC-5320A plug
- Medical IEC60601-1 approval

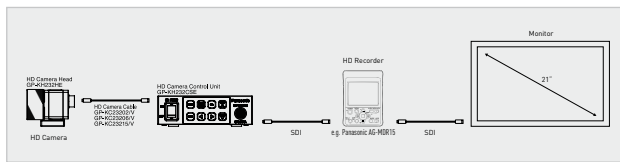
SPECIFICATIONS

GP-KH232E

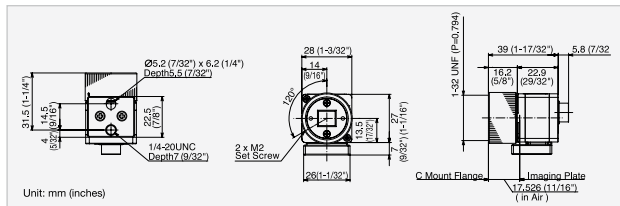
System structure



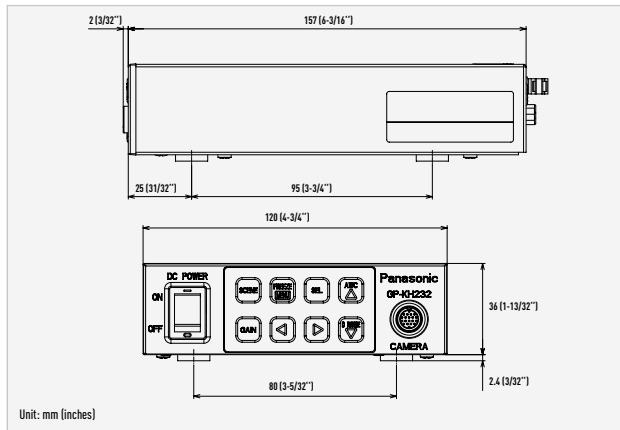
GP-KH232HE Sample Configuration



GP-KH232HE



GP-KH232CUE/GP-KH232CSE



| | | GP-KH232HE | |
|-------------------------------|------------------|--|---|
| Model name | Camera head | | |
| | Control unit | GP-KH232CUE | GP-KH232CSE |
| Frequency | | 50 Hz or 59.94 Hz (switchable) | |
| Power source | | 12 V DC +/- 10% | |
| Power consumption | | Approx. 7.8W (including camera head) | |
| Image sensor | | 1/3" type FullHD MOS sensor | |
| Synchronisation | | Internal or External (for board version only) | |
| Video output | | | |
| S-video output | | 1x S-Video connector: Y:1.0V (p-p) / 75 Ω C:0.3V(p-p) / 75 Ω | - |
| RGB/YpPr(Component) | | 1x DSUB9 connector: G:1.0V(p-p) / 75 Ω R,B:0.7V(p-p) / 75 Ω Y:1.0V(p-p) / 75 Ω Pb,Pr:0.7V(p-p) / 75 Ω | |
| HDMI | | 1x HDMI connector | |
| HDSDI | | - | 1x HDSDI connector |
| Video format | | | |
| S-Video (Y/C) | | SD: 576/50i (480/59.94i) | - |
| RGB/YpPr(Component) | | HD: 1080/50i, 1080/25p(sF), 720/50p SD: 576/50p and 576/50i (all above video formats also available for 59.94Hz) | |
| HDMI | | HD: 1080/50p, 1080/50i, 1080/25p(sF), 720/50p SD: 576/50p and 576/50i (all above video formats also available for 59.94Hz) | |
| HDSDI | | - | 1080/50i, 1080/25p(sF), 720/50p, and 576/50i (also available for 59.94Hz) |
| Required illumination | | 2000 lx (3200 K, F5.6) | |
| Minimum illumination | | 10 lx (F1.4, Gain::High, 30% output) | |
| S/N | | 54dB (when 1080i output) | |
| Horizontal resolution | | 900TV Lines (at center, when 1080i output) | |
| Functions (GP-KH232C) | | Camera title, ELC, Electronic shutter, Gain adjustment, Electronic sensitivity enhancement, 3x Scene file, Video format select, White balance, Electronic Zoom, Freeze, Flip, Mirror, Status display | |
| External control (GP-KH232C) | | RS232C signal level compliant (via 3.5mm mini jack) | |
| Lense mount type (GP-KH232HE) | | C-Mount | |
| Ambient operation temperature | | 0°C bis +40°C | |
| Ambient operation humidity | | 30% bis 90% | |
| Dimensions | GP-KH232 CUE/CSE | 120(W) mm x 36(H) mm x 157(D) mm (excluding rubber feet and projections) | |
| | GP-KH232HE | 28(W) mm x 27(H) mm x 39(D) mm (excluding rubber feet and projections) | |
| Weight | GP-KH232 CUE/CSE | Aprox. 660 g | |
| | GP-KH232HE | Aprox. 43 g | |
| Finish | | Ivory color coating | |

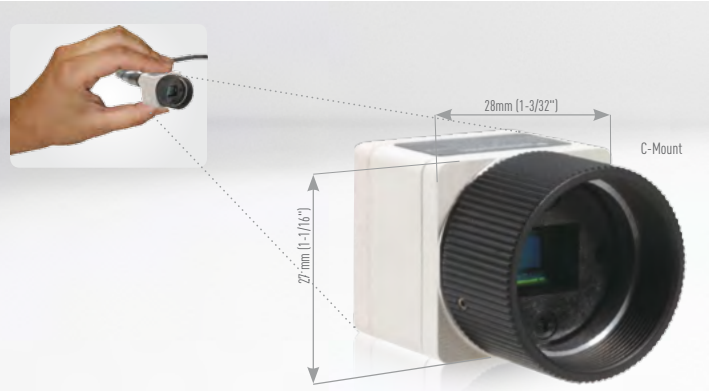
Recommended Lenses

| Manufacturer | Model | Specification |
|--------------|-------------|-----------------------------|
| FUJIFILM | DF6HA-1B | C-Mount, 6mm fixed focus |
| FUJIFILM | HF9HA-1B | C-Mount, 9mm fixed focus |
| FUJIFILM | HF12.5HA-1B | C-Mount, 12.5mm fixed focus |
| FUJIFILM | HF16HA-1B | C-Mount, 16mm fixed focus |
| FUJIFILM | HF25HA-1B | C-Mount, 25mm fixed focus |
| FUJIFILM | HF35HA-1B | C-Mount, 35mm fixed focus |
| FUJIFILM | HF50HA-1B | C-Mount, 50mm fixed focus |

MOS-TECHNOLOGY

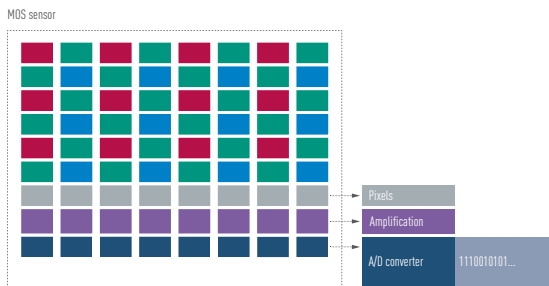
• QUALITY STARTS WITH THE HEAD

Thanks to MOS Technology the video signal chain inside the Panasonic HD micro cameras becomes fully digitized. The digital, Full HD progressive scan signal generated in the head and loss free transmitted via the camera cable is processed with high bandwidths at the control unit.



• ADVANTAGES OF MOS SENSOR TECHNOLOGY

MOS



Lower Power consumption thanks to a driver circuit which is on the same chip of the MOS sensor.
Advantages - Less heat, Longer operating life, Less defective rate



Size will become smaller as processing technology progressed because of no need of transfer device.



No Blooming nor Smear thanks to MOS's signal readout structure



CCD



High Power consumption required due to a driver circuit for CCD sensor.



Downsizing of cell has limitations due to the CCD sensor's transfer device portion.



Blooming or Smear can be seen due to CCD's architectural issue. Not possible to remove by post-processing



TREND: CCD to MOS sensor migration at supply side ongoing. No manufacturer develops a small size CCD image sensor with more than 2M pixels. Evidently, migration from CCD accelerates hereafter.



MEDICAL

Medical documentation systems are benefiting from the development in camera technology with the introduction of components with the best video capabilities for resolution, sensitivity and color reproduction in combination with highly compact systems.



BROADCAST

For television producers, filming point-of-view shots such as those seen in nature or sports TV programs is accomplished using micro camera technology. The excellent color reproduction of these provide viewers with a realistic experience.



INDUSTRIAL

Manufacturing companies with quality control and inspection needs benefit from the robust design and high quality of Panasonic micro cameras. Due to the remote head concept the camera can be integrated in narrow, limited spaces.



LIVE SCIENCE

Technological advancements in the field of microscopic research have made it possible to study even smaller structures in high resolution video and color brilliance.

Panasonic

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