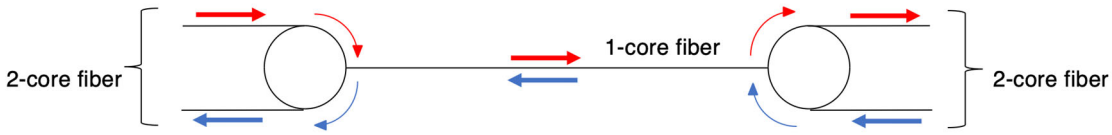
UHL-F4000 Helicopter-Mountable 4K/HD HDR-Compatible Camera

With the advent of the 4K era, helicopter aerial photographers are increasingly using 4K cameras mounted on an anti-vibration gimbal for protection from helicopter vibration. However, 4K cameras have been larger and heavier than HD models so could not be mounted on a small gimbal. In addition, the higher power consumption of 4K cameras causes the internal temperature to rise if a 4K camera is placed in a sealed anti-vibration gimbal. This shortens the camera's lifetime and can even lead to sudden failure. To solve these problems, Ikegami has developed the UHL-F4000, a helicopter-mountable ENG camera with a 4K optical separation structure. This camera has the high sensitivity required for night shooting plus image sharpening to remove fog and haze. These features will be familiar to users of the Ikegami HDL-F3000 aerial HD camera.

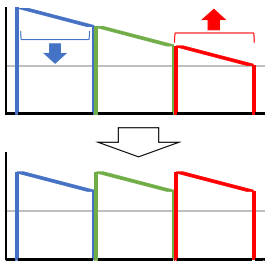
Fog and haze removal OFF　　Fog and haze removal ON

The UHL-F4000 has a two-piece structure comprising the front-end camera head and the CCU. Camera head and CCU are connected by dual-core optical fibre cable with 40 Gbps transmission speed. The dual-core optical fibre cable can be integrated into one bidirectional core via an optical circulator and passed through a single-core optical rotary joint used for a small gimbal.



As all video processing is performed in the CCU, the camera head consumes very low power so does not cause heat generation even in a sealed gimbal. The CCU simultaneously outputs 4K and HD video compatible with HDR. Genlock and remote control cables are connected to the CCU with this configuration so there is no need to run the metal cables into the gimbal. A 10x digital zoom is built-in. The image sensor uses three CMOS global shutters so there is no rolling shutter distortion even in aerial photography where subjects are constantly moving in parallel. For lens aberration correction, the camera can access correction data installed in the lens servo block. Aberration correction is possible even if the servo block is removed from the lens to be used in the gimbal. Equipped with a 1/256 neutral-density optical filter, it can prevent small aperture blur which is likely to occur in outdoor shooting due to the diffraction limit. The 5-position ND filter has a 2-stop dimming interval so the position can be automatically changed when the lens extender is turned on or off, and the change in light intensity of the 2-stop with the extender can be corrected to keep the iris constant.

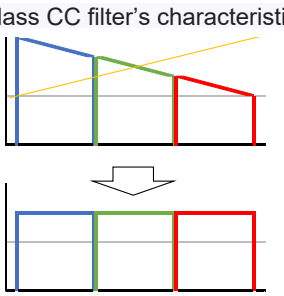
The CC filter is equipped with a glass type and can express the color gamut of 4K BT.2020 correctly. In ECC (Electrical Color Temperature Correction), the image level is corrected evenly in each of the R and B wavelength regions, so it is not noticeable with the correction error HD BT.709, but it is noticeable with 4K image. By using a glass type filter, linear correction according to each wavelength is performed and correction errors can be reduced.



Corrected evenly in each of the R and B.

Noticeable correction error.

ECC(Electrical Color Temperature Correction)

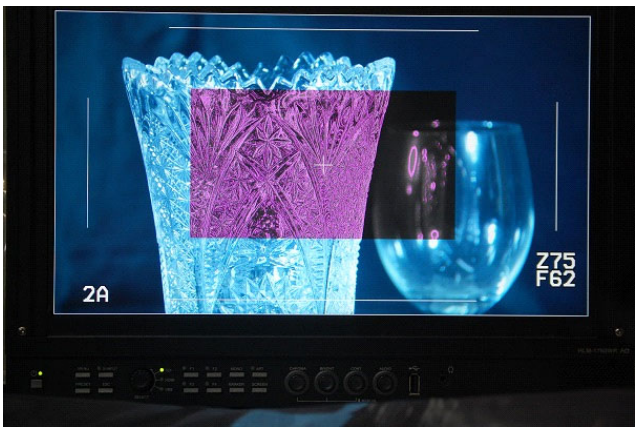


Linear correction according to each wavelength.

Errors can be reduced.

CC filter (Glass type)

A focus-assist function adds edges on HD video, extracted from 4K images to facilitate 4K focus even on the small HD monitor commonly mounted in a helicopter.



Focus Assist: ON

The CCU's uses the same AXII high-speed video processor which is incorporated in Ikegami UHK-430 and UHK-435 studio/broadcast cameras, making possible a variety of imaging styles for broadcasting.

UHK-430

AXII

The optical fibre cable connecting camera and CCU can be extended up to 10 km (6.2 miles). This feature can also be applied for applications such as surveillance and data monitoring which require the camera to be operated from a remote location. The lightweight camera head can be mounted on a motor-driven pan/tilt head for robotic operation in a studio. In this configuration, the genlock or remote control cable can be connected to the CCU and the cable does not obstruct operation on the camera side. A 100Base-TX Ethernet trunk line between camera and CCU makes it possible to control the camera platform and lens via the optical fibre cable. For data-monitoring cameras and robotic cameras, it is possible to obtain two images with different angles of view in HD cutout from 4K video.