

## IKUSNET3 HR APPLICATIONS

Possible video codec operating scenarios

### OVERVIEW

Ikusnet3 HR is a compact, bidirectional, reliable video codec for Internet communications, with independent talkback audio channel and at an unbeatable price.

It supports HEVC and AVC encodings and different streaming protocols (SRT, RTMP/RTMPS, MPEG TS), including the BRAVE protocol from Prodys that allows to provide communications with greater bandwidth and reliability by adding several IP links.

### MAIN FEATURES

Ikusnet3 HR is a video codec with special features that differentiate it from the majority of equipment on the market:

- One HDMI and SDI input, with auto detection and one SDI output.
- High degree of compatibility thanks to the use of standard SRT, which allows encryption of the video signal, and other standard protocols like MPEG-TS and RTMP protocols, as well as the possibility of using the advantages associated with Prodys proprietary BRAVE protocol:
  - Two-way and simultaneous video transmissions.
  - IP links aggregation (bonding mode).
  - Redundant transmissions (diversity mode).
  - Active recovery of IP packets lost during transmission.
- Two-way and simultaneous video transmissions also for SRT streaming Protocol.
- HEVC compression with 720p, 1080i and 1080p formats. AVC encoding for compatibility with less recent video equipment.
- Four audio channels embedded in the video stream and a separate stereo talkback channel.
- Less than half a second of latency.
- Possibility to work with 2 Ethernet ports and up to 8 5G/LTE links via the external HG2 module.



## APPLICATION SCENARIOS

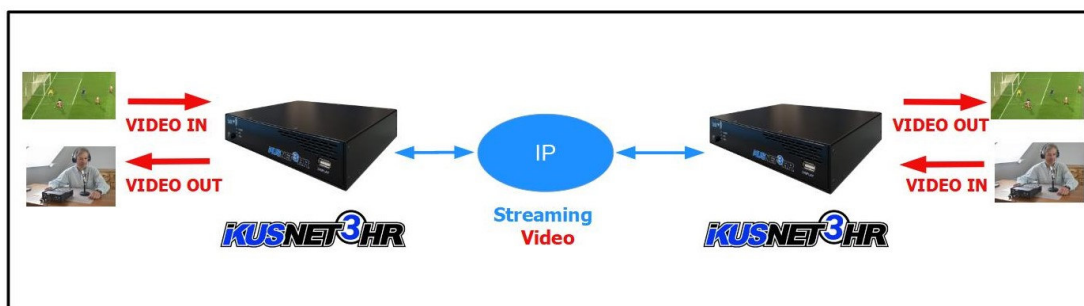
Ikusnet3 HR has been designed to provide an affordable solution for professionals who need secure video links, as well as a complement for systems where a video encoder or decoder needs to be integrated, including integration with Quantum2 audio codecs.

### Point-to-point links

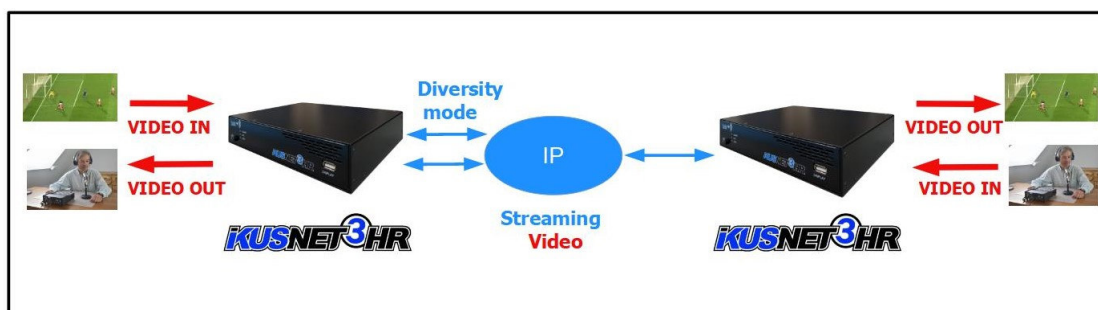
This would be the traditional application of such equipment, but with Ikusnet3 HR there are several advantages that make the equipment extremely versatile.

Firstly, Ikusnet3 HR can work as both an encoder and a decoder, so the same device can be used at both ends of the point-to-point communication.

In addition to this, the proprietary BRAVE protocol and also the SRT protocol allow video transmission in both directions to be simultaneous, i.e. an Ikusnet3 HR can transmit and receive video at the same time.

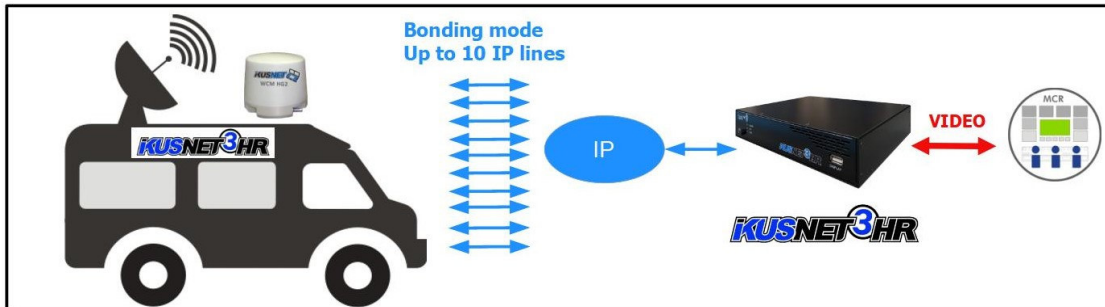


Another advantage of the BRAVE protocol is the possibility of using more than one IP link. Ikusnet3 HR has 2 Ethernet ports that can be used to transmit the encoded video simultaneously, using the Diversity mode. In this mode, the video stream is duplicated and sent on each interface, so that every IP packet has a copy sent on another path, so that a packet loss on one of the interfaces is easily corrected by the packets sent on the other. The great advantage of this way of working compared to more traditional backup solutions is that it does not affect the quality of service as there is no interruption in the received image and the delay is always minimal.



## Links in OB Vans

A particular case of the above arises when an Ikusnet3 HR is installed in a mobile unit to achieve a video link with the central studios. It is not surprising that the IP connections that can be achieved in this work scenario are unreliable and of low capacity for the transmission of quality video.



Thanks to the BRAVE protocol, it is possible to connect a communications module with 8 LTE/5G modems to the Ikusnet3 HR installed in the mobile unit. These 8 wireless IP connections, together with the two Ethernet ports available in the equipment, make a total of 10 links whose bandwidth can be aggregated to obtain sufficient transmission capacity, using the Bonding mode. The BRAVE protocol would automatically load-balance between the available links to achieve the best transmission quality. The bandwidth of the coded signal can also be automatically adapted to the network capacity. In case of packet losses, the active recovery mechanism would cause the lost packets to be retransmitted by the encoder.

The Ikusnet HG2 radome is a wireless communications module that contains 8 LTE/5G modems with their respective high gain antennas and allows to expand the number of IP connections available in Prodys Ikusnet or Quantum equipment with this possibility, such as the Ikusnet3 HR.

It is made of fiberglass and its watertight design allows it to work outdoors, installed on the roof of a mobile unit.



## Video equipment for Quantum<sup>2</sup>

The Quantum2 W and Quantum2 XL audio and video equipment has the outstanding feature that they can work as both video encoders and decoders. With the equipment working as a video decoder, commentators can receive the video signal to comment on the same equipment they use to send their audio comments. Working as a video encoder, commentators can send to their central control a video stream with images from the commentator's set, e.g. the interview of personalities approaching the set or their own images commenting on the event.

Ikusnet3 HR is the ideal equipment to pair with any of the Quantum2 models, since by sharing the same BRAVE transmission protocol, it is possible to create bidirectional links between the Quantum2 equipment and the Ikusnet. Furthermore, if the Quantum2 equipment uses bonding for video communication over several IP interfaces, the Ikusnet equipment will be able to recompose the original signal.



The Quantum2 and Ikusnet3 devices can be combined in two basic ways:

### Quantum2 portable unit + Quantum ST + Ikusnet3 HR

Whether the Quantum2 user needs to receive video for their work, generate video, or both, we can treat audio and video communications differently, as they can be sent in different streams. In this case, the two stereo audio channels can be established between Quantum equipment or between the Quantum portable and another codec of another brand using the SIP compatible protocol. In parallel, video communication, unidirectional or bidirectional, would be established between the Quantum2 and the Ikusnet3 HR.



### Quantum2 portable unit + Ikusnet3 HR

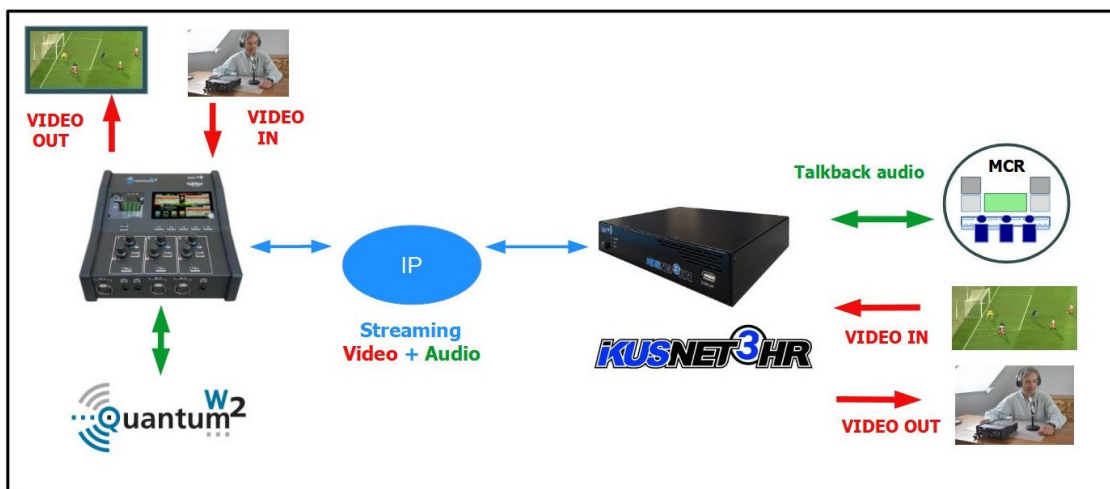
Taking advantage of the audio channels embedded in the video signal, it is possible to include in them the audio signals of the commentators by means of the matrices that control the audio mix in the Quantum2 equipment. Similarly, the return audio from the studio can be extracted from the audio embedded in the video signal.

The number of channels depends on the transmission format:

- BRAVE, MPEG TS and SRT allow up to 4 channels.
- RTMP only allows two channels.



It is also possible to use the talkback channel to establish an audio connection between the Ikusnet3 HR and the Quantum2 laptop. This channel is independent of the video stream.



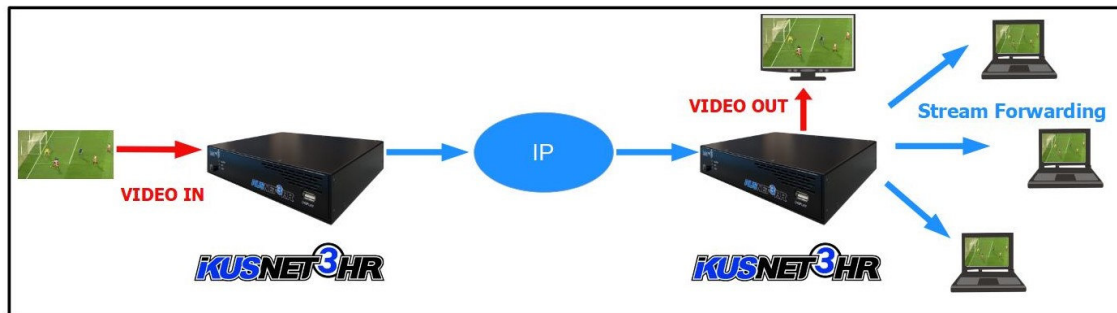
## Stream Forwarding

The Ikusnet3 HR video equipment has a Stream Forwarding function that allows, at the same time as decoding, to forward the stream received in a standard protocol (MPEG-TS, RTMP/RTMPS or SRT).

With this function it is possible to receive a video in BRAVE protocol and forward it, with a compatible protocol, to a server in the cloud or broadcast it on a local computer network in which the video is accessible from a media player on any of the machines.

In this mode, by not re-encoding the video, the quality of the original signal is maintained.





## REMOTE MANAGEMENT

The Ikusnet3 HR equipment can not only be controlled locally via its touch screen but can also be controlled remotely from the MCR via the ProdysControlPlus application. This application works without the need to configure the ports of the receiving equipment, which simplifies the management of the equipment by the end users, who can delegate the configuration and monitoring of the remote equipment, including the preview of the video signal, to the technicians located in the MCR.

