



Fig. 5
Video over TCP/IP

As a new enhancement KLEINBIT can now also offer to interface MPEG2 video codecs (our own as well as other manufacturers) to standard TCP/IP networks, allowing broadcasters and network operators to use their TCP/IP networks for high quality video transmissions.

Based upon the above brief explanation it should be our privilege to be able to offer our services to you and work together with you in order to provide yourself and your customers with the optimum solutions.

- KLEINBIT A/S -

In cases where it is decided that the video quality is required to be better than that achievable on one single 2 Mbit/s, we can offer a solution, which employs an I-MUX. This means that the output signal (normally ASI/TCP or RS422) is fed to the I-MUX, which then presents the signal at its output terminals as a multiple E.1 output signal, which can then be carried over a standard telecom network.

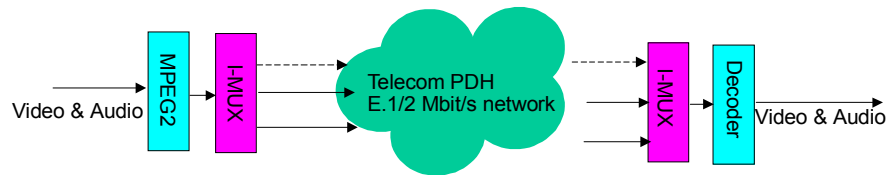


Fig. 2
Multiple E.1 lines (Max. 8)

In a case where an I-MUX is not inserted it will be necessary to utilize one full 34 Mbit/s (E.3) line instead, which will often not be available nor cost efficient. Instead the I-MUX solution offers to use only the number of E.1's, which are necessary for the operation.

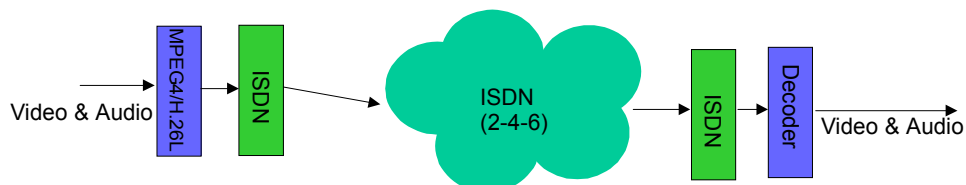


Fig. 3
Video Over ISDN

In those cases where low latency (low coding delay) is of importance and where bandwidth is very limited a special MPEG4/H.26L based solution is offered.

This solution will offer operation on standard ISDN lines using between 2 to 6 ISDN (128 to 384 kbit/s), depending upon the desired video resolution and frame rate.

SATELLITE:

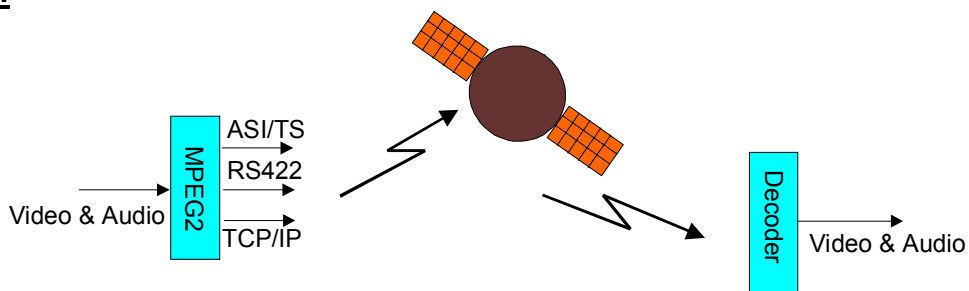


Fig. 4
Transmission via satellite

For operation via satellite KLEINBIT offers the same MPEG2 and MPEG4/H.26L based solutions since most satellite modems accept as standard input ASI/TS based signals as well as E.1 and RS422 signals. This means that the same products may be used for a variety of different solutions.

TCP/IP:

*** STANDARD SOLUTIONS ***

FOR VIDEO AND AUDIO TRANSMISSION

Over the years KLEINBIT has served as partner and project developer for European Broadcasters and Tele Administration, assisting in the development and implementation of new technologies and solutions.

Constantly working on project developments and implementation of new technologies and solutions has made us pay too little attention to our abilities which may be offered as a support to a broader customer basis concerning the expertise which has been gathered over the years within this special area, concerning products, services, and solutions.

This paper is therefore intended to compensate for this. We want to inform about some of the products and solutions which KLEINBIT is able to offer within our special areas of competence which include:

Digitization of Video and Audio Signals

Compression of Audio and video signals according to MPEG2, MPEG4, H.26x

Transmission of Video and Audio signals in;

- Telecom Terrestrial Networks (PDH, ATM, SDH), incl. nxISDN, E.1, NxE.1
- Satellite, RS422, V.11, E.1, NxE.1, ASI/TS
- Wireless, E.1, RS422, V.11
- TCP/IP

Focusing upon the main areas where we believe we may be able to provide special assistance and expertise in connection with digitization, compression, and transmission of video and audio signals may be divided into 3 main areas, related to the 3 standard main network groups PDH, Satellite, TCP/IP.

PDH:



Fig. 1
One single E.1 line

Fig. 1 Illustrates a standard solution which uses our cost efficient High performance MPEG 2 Codec optimised for low bitrate applications, which facilitates operation on only one single 2 Mbit/s line (G.703, HDB3 Unstructured), allowing full TV resolution.