

MoIN

Multimedia over IP  
Network

Professional multi-format, multi-channel  
multimedia over IP server (hardware, software, cloud)



# MoIN – Multimedia over IP Network



## Audio networks based on different protocols

- ▶ Broadcast based on EBU TECH 3326, SMPTE ST 2110
- ▶ AES67 based on RAVENNA, Livewire or Dante
- ▶ Server based on Icecast, Shoutcast, Wowza

## Audio coding – fitting to your needs

High quality multi-format Audio de/encoding

- ▶ MPEG ½ layer 2, 3
- ▶ G.711, G.722, linear PCM
- ▶ Opus
- ▶ Ogg Vorbis
- ▶ MPEG 2/4 AAC LC
- ▶ MPEG 4 AAC LD/ELD
- ▶ MPEG 4 HE-AAC v1&v2
- ▶ Extended HE-AAC (xHE-AAC)
- ▶ Enhanced aptX (E-aptX)
- ▶ Optional: Bit transparent transmission of digital audio and MPX signals
- ▶ On request: Dolby Digital plus (AC3)

## IP streaming

(Unicast, Multiple Unicast & Multicast)

Rock solid network connection even in stress conditions according to standards RFC 3550, RFC 3551, RFC 3640, RFC 2250

- ▶ Professional elementary audio IP streaming using UDP, RTP/RTCP (standardized by EBU N/ACIP Tech 3326, SMPTE ST 2110)
- ▶ TS RTP, UDP and SRT streaming
- ▶ SRT Secure Reliable Transport
- ▶ Pro MPEG FEC
- ▶ Dual streaming
- ▶ Optional: Livewire/Ravenna (SIP, SAP, RTSP, AES67, PTPv2)

- ▶ Optional: Stream4Sure: 2wcom streaming technology with different codecs/qualities and seamless switching off up to 4 streams
- ▶ Icecast source client

## Backup / advanced redundancy management

- ▶ Flexible automatic switch over concept with free definition of alternative input sources as a redundancy solution in case of failures
- ▶ Playing files from internal storage or using alternative streams (Icecast / Shouthast)

## Control

- ▶ Remote control with various possibilities – HTTP/S, FTP, SSH, NMS, SNMP
- ▶ Revised configuration via web user interface for easier setup
- ▶ Ember+

## Special

- ▶ Energy efficient 24/7 broadcast quality
- ▶ RDS decoding (built in RDS/UECP decoder)
- ▶ Embedded auxiliary data (RBDS/RDS or PAD) and GPIO forwarding

## Monitoring

- ▶ IP and MPEG parameters via SNMP
- ▶ Icecast Live Listening

## Perfect audio & latency management

- ▶ ACIP compliant high audio quality and extremely low latency (PTPv2 network synchronization)



# MoIN – Multimedia over IP Network

The screenshot displays the MoIN web interface. On the left is a navigation menu with sections: Information (Overview), Codec Settings (Codec, Switch Criteria), Network Settings (TCP/IP, SNMP), and AoIP Settings (SIP Phonebook, Easy2Connect, SIP, SAP, PTP, RTSP, Livewire). The main content area shows the MoIN configuration page with fields for Name, Location, and Description. Below this is an Overview section with a Status table:

Status	
Uptime:	50 days, 17:59:44
Ctrl:	UP, 1 Gbit, Full Duplex - 192.168.100.98
Data 1:	DOWN
Data 2:	DOWN

Below the status are Decoder and Encoder sections. The Decoder section shows two audio channels (Audio 1 and Audio 2) with 'Main' set to 'None'. The Encoder section shows six encoders (Encoder 1 to Encoder 6) with various settings like codec (MP2, PCM), sample rate (SR), and bit rate (BR).

## Advanced IP robustness functionalities

- ▶ Even to be operated in standard IP networks
- ▶ SRT Secure Reliable Transport
- ▶ Pro MPEG FEC
- ▶ Management of packet size, buffers and QoS
- ▶ Optional: Stream4Sure: 2wcom Streaming Technology with different codecs/qualities and seamless switching of up to 4 streams

## Highly sophisticated monitoring and alarm concept

- ▶ Adjustable silence detection
- ▶ IP buffer and jitter check
- ▶ SNMP, alarm, source switch & event logging

## Connect all known AoIP network devices

- ▶ MoIN can be used for audio routing, managing, levelling, loudness, monitoring and mixing between different protocols and environments
- ▶ The mixing and routing of different channels between different networks in synchronized manner is possible
- ▶ The integrated mixer can handle all audio signals also based on different clocks
- ▶ Audio streams can be combined to multichannel streams
- ▶ By supporting distribution services architecture (DS), the server allows for purpose-built products and services (i.e. DSLinks) to interact with one another in a decentralized manner. This

- ▶ architecture enables a network architect to distribute functionality between discrete computing resources
- ▶ Easy integration of third party applications

## Audio matrix

- ▶ The audio inputs and audio outputs are available for IP data streams based on elementary and MPEG-TS streams via RTP and UDP
- ▶ The audio matrix functions control the routing, bridging and mixing of all audio signals
- ▶ Combining of different audio stream sources for a multichannel stream destination
- ▶ Sample rate converter (SRC) to combine different connections with different sample rates or different clocks
- ▶ Optional: functions for audio processing – e.g. loudness, limiter
- ▶ Optional: Analog, MADI or AES / EBU interfaces



# Technical details 1/2

## Audio

### Codexs

<b>Standard</b>	MPEG 1/2 Layer 2, 3 Linear PCM G.711, G.722 Opus Ogg Vorbis
<b>Optional:</b>	MPEG 2/4 AAC LC MPEG 4 AAC LD/ELD MPEG 4 HE-AAC v1&v2 Extended HE-AAC (xHE-AAC) Enhanced aptX (E-aptX) Dolby digital plus (AC3 on request) ask for other codexs
<b>Optional:</b>	Bit transparent transmission of AES/EBU input
<b>Sample Rates</b>	kHz: 16, 22,05, 24, 32, 44.1, 48 (On request: up to 192 kHz)
<b>Sample rate converter</b>	8:1

## Interfaces

### Performance

<b>Encoder instances</b>	Up to 512x AES/EBU, 110 $\Omega$ bal, (hardware server: connectors are depending on the chosen model)
<b>Decoder instances</b>	Up to 512x AES/EBU, 110 $\Omega$ bal, (hardware server: connectors are depending on the chosen model)
<b>Data streams (in)</b>	Up to 512
<b>Data streams (out)</b>	Up to 3.096

### Ethernet

<b>Data</b>	Audio, serial data and GPIO transmission, controlling and setup functions
<b>Connector (hardware server)</b>	Depending on the model in use
<b>Type (hardware server)</b>	Depending on the model in use
<b>Streaming protocol</b>	EBU Tech 3326, 3368, AES 67, Ravenna, Livewire+, SMPTE ST 2110, SRT Secure Reliable Transport, RTP/RTCP/UDP, IGMP, ICMP, DHCP, HTTPS, FTPS, SNMP, NTP, PTPv2, TCP (Icecast)

### Serial (hardware server)

<b>Interface</b>	Depends on the model in use
<b>Data</b>	Private data, MPEG ancillary data, UECF/RDS (acc.to TR 101 154)
<b>Transmission rate</b>	Depends on the model in use
<b>USB</b>	1x USB 2.0 interface for service, configuration and firmware

### Time synchronization (optional)

<b>PTPv2</b>	Network synchronization according to IEEE 1588-2008
<b>1PPS</b>	SMA connector

### Internal storage (optional)

<b>Size</b>	7 GB (optional 1000 GB)
<b>Type</b>	eMMC (optional SSD)

### Contact closure

<b>Inputs (hardware server)</b>	Depends on the model in use
<b>Outputs (hardware server)</b>	Depends on the model in use

# Technical details 2/2

## Control & monitor

<b>User interface</b>	Integrated WebGUI
<b>Data</b>	Control and setup functions, private data, MPEG ancillary data (IRT)
<b>USB (hardware server)</b>	Depends on the model in use
<b>Protocols</b>	HTTP, SNMP, UDP, RTCP, SRT Secure Reliable Transport, Ember+, FTP, ICMP, IGMP, NTP, SSH, PTPv2, TCP (Icecast)

## General data (hardware server)

<b>Power consumption</b>	Depends on the model in use
<b>Case dimensions</b>	See above
<b>Weight</b>	See above
<b>Material</b>	See above
<b>Operating temp. range</b>	See above
<b>Storage temp. range</b>	See above
<b>Power supply options</b>	
<b>Internal power supplies</b>	See above
<b>Hot swap power supplies (optional – instead of internal PS)</b>	See above
<b>Power supply ranges (choosable)</b>	See above