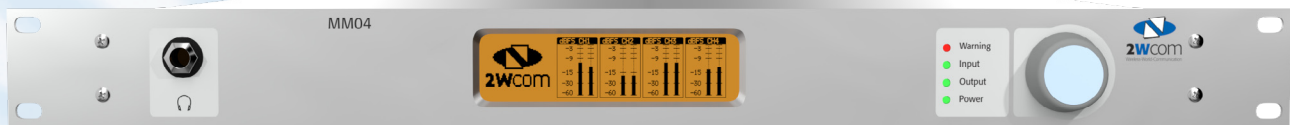


## MM04C - Audio over IP codec

Professional multi-format four channel  
audio over IP coder / decoder



Energy efficient

### Audio coding - fitting to your needs

High quality multi-format audio de/encoding:

- MPEG 1/2 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
- Enhanced aptX (E-aptX)
- Optional: Extended HE-AAC (xHE-AAC)
- Optional: Bit transparent transmission of digital audio and MPX signals (AES/EBU input at 32 - 192 kHz, e.g. Audio, MPX, DolbyE)
- 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 streaming
- SRT Secure Reliable Transport
- Pro MPEG FEC
- Dual streaming
- Optional: Livewire / Ravenna / Dante (SIP, SAP, RTSP, AES67, PTPv2)
- Optional: **Stream4Sure**: 2wcom Streaming Technology with different codecs/qualities and seamless switching of up to 4 streams

### 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 / Shoutcast)
- Dual IP ports for data + 1 IP port for control interface
- Optional: redundant power supply 230 VAC or 48VDC

## **Control**

- Remote control with various possibilities – HTTP/S, FTP, SSH, NMS, SNMP
- Revised configuration via web user interface for easier setup
- Relays, inputs
- 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 and relay
- Headphone output

## **Perfect audio quality**

- Balanced analog and digital AES/EBU (**integrated** XLR connector)

## **Advanced IP robustness functionalities**

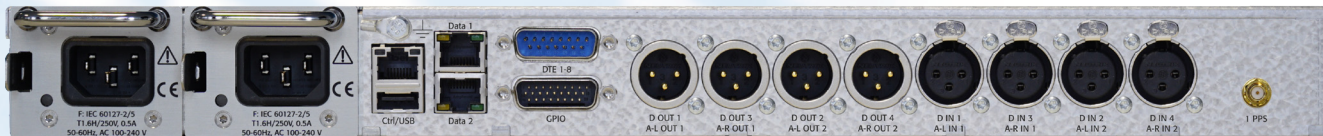
- Even to be operated in standard IP networks
- SRT Secure Reliable Transport
- Pro MPEG FEC
- Management of packet size, buffers and QoS
- Optional: **Stream4Sure**: 2wcom Streaming Technology with different codecs/qualities and seamless switching of up to 4 streams

## **Perfect latency management**

- Optional: GPS based 2wcom latency control solution for usage in SFN FM networks
- Optional: PTPv2 network synchronization

## **Highly sophisticated monitoring and alarm concept**

- Adjustable Silence Detection
- IP Buffer and Jitter check
- PLL control
- SNMP, Alarm, Source Switch & Event Logging



Rear view MM04C - Audio over IP codec

# MM04C - Audio over IP codec – Technical Details

## Audio

### Codecs

Standard	MPEG 1/2 Layer 2, 3 Linear PCM G.711, G.722 Opus Ogg Vorbis MPEG 2/4 AAC LC MPEG 4 AAC LD/ELD MPEG 4 HE-AAC v1&v2 Enhanced aptX (E-aptX) Extended HE-AAC (xHE-AAC) Dolby digital plus (AC3, on request) ask for other codecs
Optional:	Bit transparent transmission of AES/EBU input (e.g. Audio, MPX, DolbyE)
Optional:	Bit transparent transmission of AES/EBU input (e.g. Audio, MPX, DolbyE)
Sample Rates	16 kHz, 22.05 kHz, 24 kHz 32 kHz, 44.1 kHz, 48 kHz optional: up to 192 kHz
Sample Rate Converter	8:1

## Interfaces

### Performance

Digital (in)	4x AES/EBU, 110 Ω bal., integrated XLR
Digital (out)	4x AES/EBU, 110 Ω bal., integrated XLR
Analogue (in)	max. 2x L/R, >10 kΩ bal., integrated XLR
Analogue (out)	max. 2x L/R, <20 Ω bal., integrated XLR
Headphone (out)	L/R, <10 Ω, 6.3 mm
Digital reference input	no dedicated input, selectable by user
Digital reference level	-9 dBFS (adjustable)
Gain	-32...+6 dB
Dynamic range	16 Bit, >89 dB 24 Bit >130 dB
Frequency response	depends on sample rate - e. g. 48 kHz: 0,1 dB; 20 Hz .. 22,5 kHz

### Ethernet

Data	Audio, serial data and GPIO transmission, controlling and setup functions
Connector	3x RJ45 (2x data, 1x ctrl)
Type	Auto Switching 10/100/1000 BASE-T
Protocol	RTP/RTCP/UDP, SRT Secure Reliable Transport, IGMP, ICMP, DHCP, HTTPS, FTPS, SNMPgebur, NTP, TCP (Iccast), PTPv2, SMPTE ST 2110

### Serial

Interface	8x RS-232C (rear) Sub D-15
Data	Private data, MPEG ancillary data, UECP/RDS (acc. to TR 101 154)e
Transmission rate	1200 to 115200 baud, asynchronous
USB	1x USB 2.0 Interface for service

### Time Synchronization (optional)

PTPv2	Network synchronization according to IEEE 1588-2008
1PPS	SMA connector

### Internal storage (optional)

Size	7 GB (optional 1000GB)
Type	eMMC (optional SSD)

### Contact closure

Inputs	8x 26 pole sub-D male
Outputs	7+1 floating relays 7 Relays SPST (Form A) 1 Relay SPDT (Form C) (for DC: max. 30 V, 1 A, 10 W) 26 pole sub-D male

## Control & Monitor

User interface	Integrated WebGUI, LCDisplay
Data	Control and setup functions
Optional	Private data, MPEG ancillary data (IRT)
USB	USB 2.0 Interface for service, configuration and firmware updates
Protocols	HTTP, SNMP, UDP, RTCP, SRT Secure Reliable Transport, FTP, ICMP, IGMP, NTP, SSH, PTPv2, TCP (Iccast)

### Front panel

LCDisplay	Graphical, 264x64 pixel
Jog Wheel	Impulse, Enter button
4 Duo LEDs	Power, Input, Output, Warning

## General data

Power consumption	< 20 W
Case dimensions	19", 1 HU, depth: 310 mm, width: 424 mm, front panel: 484 mm
Weight	<5 kg
Housing	steel plate (aluminum-zinc coated)
Operating temp. range	0...+45°C
Storage temp. range	-40...+70°C

### Power supply options

Internal power supplies	1 - 2 (option) internal power supplies aut. switchover
Hot swap power supplies (optional - instead of internal PS)	2 hot swap power supplies aut. switchover
Power supply ranges (choosable)	90...260 VAC, 47...63 Hz 40...60 VDC (Neutrik power-CON)
Languages	English

Version 06.09.2018  
These data are subject to modifications and amendments.  
Errors excepted



**2Wcom**  
Wireless-World-Communication