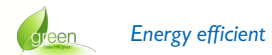
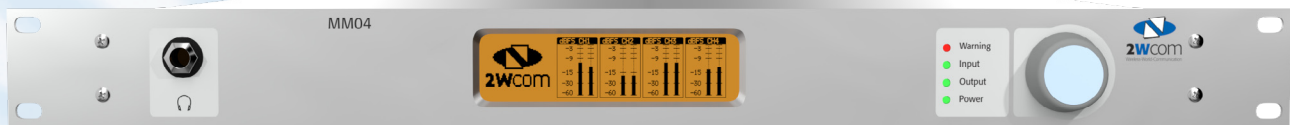


## MM04C - Audio over IP codec

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



### Audio coding - fitting to your needs

High quality multi-format audio de/encoding/transcoding:

- 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/ELD v2
- MPEG 4 HE-AAC v1&v2
- Enhanced aptX (E-aptX)
- 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: (hot swappable) 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<br>Linear PCM<br>G.711, G.722<br>Opus<br>Ogg Vorbis<br>MPEG 2/4 AAC LC<br>MPEG 4 AAC LD/ELD/ELD v2<br>MPEG 4 HE-AAC v1&v2<br>Enhanced aptX (E-aptX)<br>Extended HE-AAC (xHE-AAC)<br>Dolby digital plus (AC3, on request)<br>ask for other codecs |
| Optional:             | Bit transparent transmission of AES/EBU input (e.g. Audio, MPX, DolbyE)  |
| Optional:             |  |
| Sample Rates          | 16 kHz, 22.05 kHz, 24 kHz<br>32 kHz, 44.1 kHz, 48 kHz<br>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<br>24 Bit >130 dB                                    |
| Frequency response      | depends on sample rate - e. g. 48 kHz:<br>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<br>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<br>26 pole sub-D male   |
| Outputs | 7+1 floating relays<br>7 Relays SPST (Form A)<br>1 Relay SPDT (Form C)<br>(for DC: max. 30 V, 1 A, 10 W)<br>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<br>40...60 VDC (Neutrik power-CON) |
| Languages   | English   |

Version 30.11.2018  
These data are subject to modifications and amendments.  
Errors excepted

