

# MPX-1ds Single channel MPX decoder

Professional FM-MPX IP codec with satellite tuner

# MPX-1ds – MPX over IP decoder with satellite tuner



## MPX-1ds Base unit

- ▶ Base unit with decoding function
- ▶ Analog & digital MPX interface
- ▶ Pro-MPEG FEC Practice #3 release 2 to reduce packet loss and burst errors in IP data stream
- ▶ Analog Left/Right audio decoded MPX output via XLR
- ▶ 2x Gigabit IP interface
- ▶ Integrated Satellite tuner
- ▶ Free configurable GPIO interface
- ▶ RS232 interfaces are flexibly assignable to the services
- ▶ Embedded auxiliary data (RBDS/RDS or PAD) and GPIO forwarding

## Options: MPX-1ds

- ▶ Option:  $\mu$ MPX decoder
- ▶ Option: Dual streaming
- ▶ Simultaneous transmission and reception of 2 IP streams and seamless exchange of IP packages in case of failure
- ▶ Option: SFN/1PPS: Synchronization of MPX streams for FM-SFN accurate to the microsecond
- ▶ Optional 2x 230VAC internal PSU's or hot-pluggable power supplies

## Flexible in application

- ▶ Synchronization with microsecond accuracy is possible by an implemented latency control (useful for synchronous playout)
- ▶ One device can be used for pure MPX or  $\mu$ MPX
- ▶ The stream can be received via IP or satellite (one can be the backup)

## Pay as you grow

- ▶ Upgradable, because of pure SW modules

## Hybrid operation

- ▶ Forwarding the MPX signal via IP or via SAT by using MPE to increase coverage

## Transmission robustness

- ▶ Dual Streaming to increase transmission robustness
- ▶ Pro-MPEG FEG (Forward Error Correction) to reduce bit errors in the data stream



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## Codecs

### PCM

Bit depth	12 - 16, 20, 24 bit
FEC	RIST, ProMPEG FEC #3 release 2
Bandwidth	2.4 - 4.6 Mbps (no FEC)

### μMPX

Bitrates kbit/s	320, 384, 448, 576, 800
FEC	μMPX FEC, RIST, Pro-MPEG FEC #3 release 2
Bandwidth	320 - 800 kbps (no FEC)

## Decoder outputs

### Connectors MPX OUT

Digital	2x XLR (digital), balanced, 110 Ω
Analog	2x BNC, analog, unbalanced

### FM MPX signal

Signal	FM MPX digital and analog
Frequency response	20 Hz – 90 kHz: <0.05 dB
Stereo separation	>55 dB
THD	< -90 dB
SNR (CCIR-weighted)	>75 dB

### FM μMPX signal

Signal	Digital and analog
Frequency response	20 Hz – 66 kHz: <0.15 dB
Stereo separation	@500Hz >50 dB
THD	@500 Hz >70 dB
SNR (CCIR-weighted)	>69 dB

## audio signal

Analog out	L/R, < 20 Ω bal., integrated XLR
Frequency response	40 Hz – 15 kHz: <0.15dB
Adjustable gain	-9 ... +6 dB
Headphone out	L/R, < 10 Ω, 6,3 mm

## Synchronization

External	1PPS, PTP, NTP Optional: GPS
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## Ethernet

Data	Audio, serial data and GPIO transmission, controlling and setup functions
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## Satellite tuner

### Inputs F-Jack

Input 1,2	F-Jack
Frequency	950 ... 2150 MHz
Input Level	-75 ... -20 dBm

### Satellite Modulation I

<b>DVB-S (EN 300 421)</b>	
Standard Modulation / Symbol Rate	QPSK (1 ... 45MSym/s) On request: Lower symbol rates
Modulation Type	CCM
Roll-off	0.35
FEC	Viterbi, Reed Solomon ½, 2/3, ¾, 5/6, 6/7, 7/8



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## Satellite tuner

### Satellite Modulation II

#### DVB-S2 (EN 302307)

<b>Standard Modulation / Symbol Rate</b>	QPSK (1 ... 45 MSym/s) 8PSK (1 ... 45 MSym/s) 16APSK (1 ... 45 MSym/s) On request: lower symbol rates
<b>Modulation Type</b>	CCM, VCM, ACM
<b>Roll-off</b>	0.20 ... 0.35
<b>Frame Type</b>	Short, Normal
<b>FEC</b>	LDPC, BCH $\frac{1}{4}$ , $\frac{1}{3}$ , $\frac{2}{5}$ , $\frac{1}{2}$ , $\frac{3}{5}$ , $\frac{2}{3}$ , $\frac{3}{4}$ , $\frac{4}{5}$ , $\frac{5}{5}$ , $\frac{8}{9}$ , $\frac{9}{10}$
<b>Transport Stream Processing</b>	Single Transport Stream, Multiple Transport Stream, On request: Generic Stream
<b>PL Scrambling</b>	ID 0 ... 262144

## Front Panel

<b>Headphone LEDs</b>	6.3 mm / 1/4" socket Power, Input, Output, Warning
<b>Operation</b>	Display and Jog Wheel

## Back Panel

### Power supply

<b>Single supply</b>	230 VAC or -48 VDC
<b>Dual supply (optional)</b>	Second integrated 230 VAC or -48 VDC power supply with auto switchover and prioritisation
<b>Redundant hot plug power supply (optional)</b>	Hot pluggable redundant power supply, each combination of 230 VAC and 48 VDC is possible, with auto switchover and prioritisation

### Gigabit IP

<b>Type</b>	10/100/1000 Base-T
<b>Data</b>	MPEG TS or RAW Data via UDP, UDP/RTP, as Unicast or Multicast IGMPv2
<b>Connectors</b>	Optional: dual streaming 3x RJ45 (2x Data & 1x Control)

### Contact closure

<b>Connector</b>	26 pole sub-D male
<b>Inputs</b>	8 inputs
<b>Outputs</b>	8 floating relays (7x SPST, 1x SPDT) (for DC: max. 30 V, 0.5 A)

### Serial

<b>Interface</b>	2x RS-232 Sub D-9
<b>Data transmission format</b>	MPEG ancillary data embedded in audio (IRT) own IP link
<b>Transmission rate</b>	1200 to 115200 baud, asynchronous

## ► General data

<b>Power consumption</b>	20 VA
<b>Case dimensions</b>	19", 1RU Depth 310 mm Width 424 mm Front panel: 484 mm
<b>Weight</b>	< 4 kg
<b>Housing</b>	Steel plate (aluminium-zinc coated)
<b>Operating temp. Range</b>	0 ... +45°C
<b>Storage temp. Range</b>	-40 ... +70°C
<b>Supply voltage</b>	90 ... 260 V AC 47 ... 63 Hz -48V DC (option)
<b>Language</b>	English