

# MPX-1c

## FM-MPX over IP Codec

### Highlights

- ▶ 1-channel MPX Decoder
- ▶ 1-channel MPX Encoder (upgrade option)
- ▶ Optimized for MPX and  $\mu$ MPX distribution via IP



## MPX-1c – FM-MPX over IP Codec

### MPX-1c Base unit

- ▶ Base unit with decoding function
- ▶ One channel
- ▶ Analog & Digital MPX interface
- ▶ Pro-MPEG FEC Practice #3 release 2 to reduce packet loss and burst errors in IP data stream
- ▶ Free configurable GPIO interface
- ▶ RS232 interfaces are flexibly assignable to the services
- ▶ 2x Gigabit IP Interface
- ▶ Optional 2x 230VAC internal PSU's or hot-pluggable power supplies

### Options: MPX-1c

- ▶ Activation MPX encoder\*  
MPX-1c acts as a MPX over IP encoder
- ▶ Activation of second Gigabit IP data interface\*
- ▶  $\mu$ MPX decoder or encoder\*

### Flexible in application

- ▶ One device can be used as an encoder or as a decoder

### Pay as you grow

- ▶ Upgradable, because of pure SW module
- ▶ MPX encoder and decoder modules in one device

### Transmission robustness

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

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\* This function is optional. Please find the complete list of options at the end of the document.



## Technical details (1/3)

### 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	1x XLR (digital), balanced, 110 Ω shared with analog out (configurable)
Analog	1x BNC, analog, unbalanced

#### FM MPX signal

Signal	FM MPX digital or analog, FM analog L+R Signal
Frequency response	20 Hz – 90 kHz: < 0.05 dB
Stereo separation	> 55 dB
Harmonic distortion	<-90 dB
SNR (CCIR-weighted)	> 75 dB
SNR (A-weighted)	> 90 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



## Technical details (2/3)

### Encoder inputs

#### Connectors MPX in

Digital	1x XLR, balanced, >20 Ω, digital shared with analog out (configurable)
Analog	1x BNC, 75 Ω, analog, unbalanced

#### FM MPX signal

Signal	FM MPX digital or analog
Frequency response	20 Hz – 90 kHz: <0.05 dB
Input voltage range	0 ... 14 dBu

### Front Panel

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

### Back Panel

#### Gigabit IP

Type	10/100/1000 Base-T
Data	RAW Data via UDP, UDP/RTP, as Unicast or Multicast IGMPv2 Optional: Activation of 2 <sup>nd</sup> data interface
Connectors	3x RJ45 (2x Data & 1x Control)

#### GPIO

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

#### Serial

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



## Technical details (3/3)

### General Data

<b>Power consumption</b>	< 20W
<b>Case dimensions</b>	19", 1 RU, depth: 310 mm, width: 424 mm, front panel: 484 mm
<b>Weight</b>	< 5 kg
<b>Material</b>	Steel plate (aluminum-zinc coated)
<b>Operating temp. range</b>	0 – +45°C
<b>Storage temp. range</b>	-40 – +70°C
<b>Languages</b>	English

### Power Supply

<b>Standard AC</b>	1 internal IEC power connector voltage range 90 – 260 VAC (nominal 100 – 240 VAC) frequency range 47 – 63 Hz (nominal 50 – 60 Hz)
<b>Dual internal (optional)</b>	Two internal redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz)
<b>Dual hot-plug (optional)</b>	Two hot-swappable redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz)



## Options (1/2)

### MPX-1c base unit variations

Each unit includes an MPX Decoder for one single channel. You can choose between the following base unit variations:

Article no.	Name
VER69001	Base unit MPX-1c with 1x internal AC power supply
VER69002	Base unit MPX-1c with 2x internal AC power supplies
VER69003	Base unit MPX-1c with slot for 2x hot-plug power supply <ul style="list-style-type: none"><li>▶ 2x hot-plug power supplies AC / DC not included.</li><li>▶ Please order 2 hot-plug power supplies AC (VER45851) or DC (VER45852).</li></ul>

### MPX-1c hardware options

Please note that hardware options are installed at the factory in Flensburg, Germany, and can only be retrofitted independently in individual cases.

Article no.	Name	Description
VER45851	Hot-plug AC power supply	Power supply with automatic switch over in case of failure. <ul style="list-style-type: none"><li>▶ 90 – 260 VAC (nominal 100 – 240 VAC),</li><li>▶ 47 – 63 Hz (nominal 50 – 60 Hz)</li></ul>
VER45852	Hot-plug DC power supply	Power supply with automatic switch over in case of failure. <ul style="list-style-type: none"><li>▶ 40 – -60 VDC (nominal -48 VDC)</li></ul>

### MPX-1c software options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER69010	MPX encoder (analog/digital MPX Input)	Allows the MPX-1c to act as MPX encoder
VER69011	SRT/RIST encoder/decoder	SRT functionality for encoder/decoder according to SRT standard of the SRT Alliance (including UDP). RIST functionality for encoder/decoder according to IETF standard "RIST Simple Profile" and RFC 4585. Price per activated channel.
VER69012	Activation of 2. data port	For simultaneous transport (Dual Streaming) of 2 IP streams via 2 separate IP Interfaces <ul style="list-style-type: none"><li>▶ Seamless exchange of IP packages in case of failure</li></ul> Price per unit.
VER69013	µMPX decoder - MPX decompression	Algorithm to decompress the full MPX/composite signal, including pilot and RDS from IP to MPX. <ul style="list-style-type: none"><li>▶ 5 available bitrates: 320 and 800 Kbps.</li><li>▶ Max. 2 µMPX encoder or decoder per unit possible.</li></ul> Price per activated channel.
VER65120	Internal SSD storage	128 GB internal SSD storage



## Options (2/2)

Article no.	Name	Description
VER69014	μMPX encoder - MPX compression	Algorithm to compress the full MPX/composite signal, including pilot and RDS to IP. ▶ 5 available bitrates: 320 - 800 kbps. Max. 2 μMPX encoder or decoder per unit possible. Price per activated channel.
VER69015	SPN (Synchronized Playout Network)	Output synchronization via NTP time server. ▶ Accuracy: 20 ms Price per unit.
VER68016	MPEG-2 TS decoder	Decoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.222.0. Price per activated channel.
VER68017	MPEG-2 TS encoder	Encoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.222.0. Price per activated channel.
VER68025	MPE	MPE (Multiprotocol Encapsulation) encoding/decoding. Price per unit.