

MPX-1g

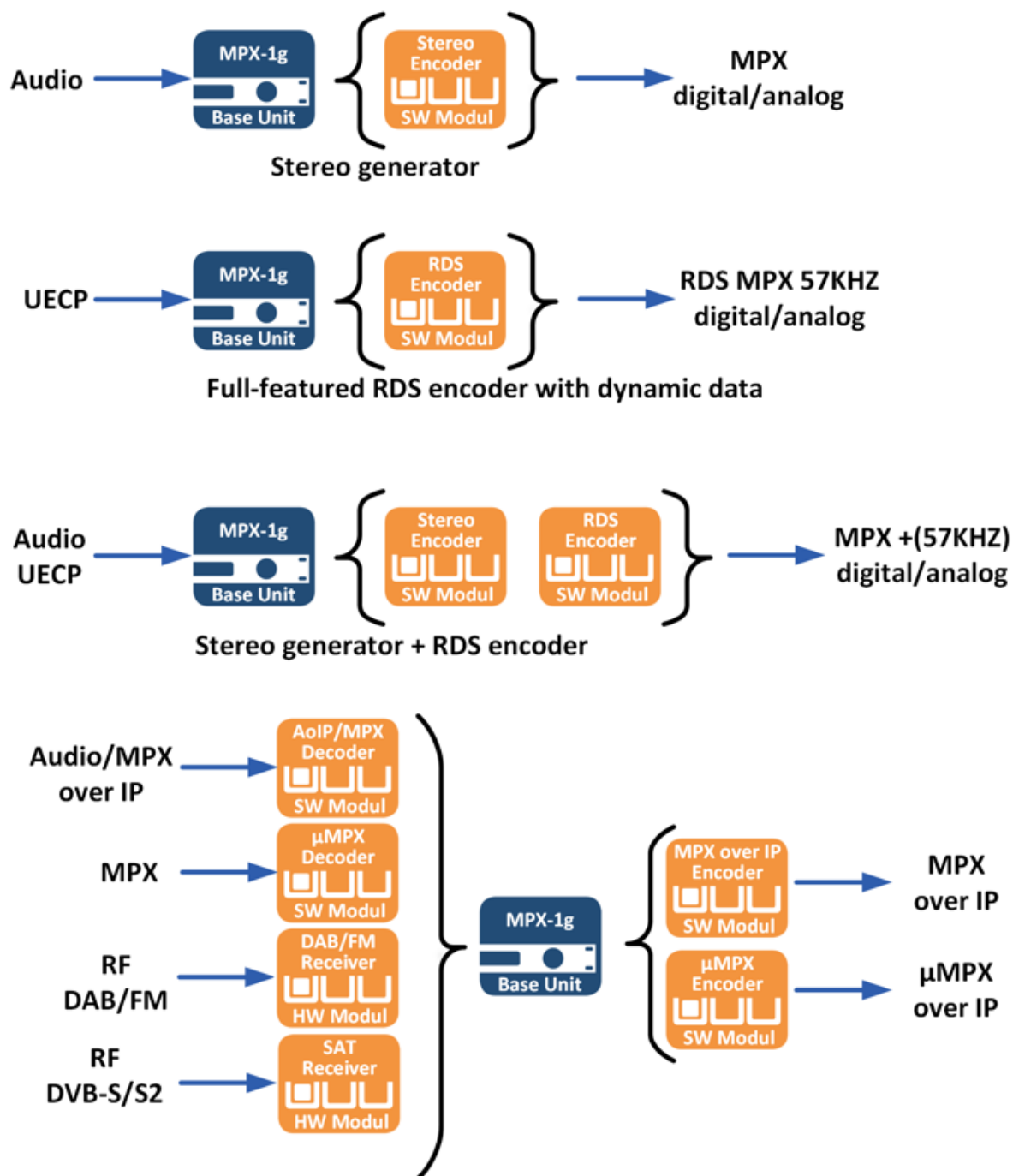
FM-MPX Stereo/ RDS Generator

Highlights

- 1-channel MPX Composite Generator
- FM-RDS Encoder Module
- FM-Stereo Encoder Module



Dedicated to Your Use Case



Optional input and output modules for versatile application scenarios



MPX-1g – FM-MPX Stereo/RDS Generator (1/1)

Dedicated to your use case

Combines modular elements to generate components of the whole FM-MPX composite signal depending on the use case:

- FM-RDS encoder
- FM-stereo encoder
- MPX rebroadcast
- MPX and μ MPX distribution via IP or satellite

Activation of the components is purely software-based. In conclusion, technicians can configure a device fitting absolutely to their needs on-site, saving costs and rack space.

RDS Encoder Module

- RDS standards: UECP 7.05, CENELEC EN 50067, IEC 62106
- Up to 16 data sets available
- Scrolling PS to show messages of up to 160 characters
- UECP via DTE (2x), IP ports (4x) or Ancillary Data (AoIP Decoder optional)
- Compatible with Arcos Config or ARCOS Network for RDS encoder fleet
- Built-in RDS decoder for live view, enables detailed analysis with RDSLab software

Stereo Generator Module

- Software-controlled signal synthesis and modulation control
- Pilot tone generation
- Adjustable pre-emphasis and phase offset
- Adjustable peak and modulation limiter*

Flexible in application – pay as you grow

- Substitution of RDS of an input MPX signal
- Audio over IP input with proven 2wcom multi-format decoding and interoperability, e.g. as backup source*
- MPX over IP input*
- FM/DAB+ tuner for re-broadcasting*

Smart Management

- Configuration via web user interface for easy setup
- Remote control and monitoring via HTTP, FTP, Telnet, Ember+, JSON, NMS, NMOS, and SNMP.
- Monitoring and alarm control of RDS and MPX parameters.

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



Technical Details (1/4)

Interfaces

Audio/MPX

MPX in	2x integrated 50 Ω BNC socket; unbalanced >10 k Ω
MPX out	2x integrated 50 Ω BNC socket; unbalanced >10 k Ω
Digital in	2x AES/EBU, 110 Ω balanced, integrated XLR female shared with analog in (configurable)
Analog in	1x L/R, < 20 Ω balanced, integrated XLR female shared with digital in (configurable)
Digital out	2x AES/EBU, 110 Ω balanced, integrated XLR male shared with analog out (configurable)
Analog out (optional)	1x L/R, < 20 Ω balanced, integrated XLR male shared with digital out (configurable)
Headphone (out)	L/R, < 10 Ω , 6.3 mm
Analog reference level	+6 dBu (max.+18 dBu)
Adjustable gain	-20 – +6 dB
Harmonic distortion	< 0.05 % / <-66 dB (40 Hz – 10 kHz)
Digital reference level	-9 dBFS
Adjustable gain	-20 – +6 dB
Dynamic range	16 Bit: > 89 dB; 24 Bit, > 130 dB

Ethernet

Connector	3x RJ45 (Control, 2x Data)
Type	Auto switching 10/100/1000 BASE-T, Unicast, Multicast

Serial/GPIO

DTE 1 + 2	2x 9 pole D-Sub male connector for the serial RS-232C data communication private data, UECP/RDS (acc. to TR 101 154)
USB	USB 2.0 interface for service, configuration, and firmware updates
Contact closure	26 pole sub-D male; 8 inputs; 8 outputs

Time synchronization

PTP v2	Network synchronization according to IEEE 1588-2008 (optional)
1 PPS	SMA Connector



Technical Details (2/4)

RDS Module

RDS Signal

Standards	UECP 7.05, CENELEC, EN 50067, IEC 62106
Coding	Differential and biphasic
Modulation	double-sideband amplitude modulation (DSSC) with suppressed carrier
Center frequency	57 kHz $\pm$ 6 Hz
Bandwidth	$\pm$ 2.4 kHz
RDS Level	0 – 8191 mVpp
RDS Phase offset	-180° – 180°
Linear distortion	< 0.5 dB between upper and lower sidebands
SNR	> 80 dB
Carrier suppression	> 85 dB

RDS Synchronization

Mode	Synchronized to external pilot or internal stereo generator
Fallback	Automatic switchover to internal oscillator
Frequency	19 kHz $\pm$ 2 Hz
Level external	< 9 Vpp

RDS Features

RDS Functions	PS, PI, TP, TA, PTY, PTYN, MS, DI, RT, CT, AF 64 lists, EON, EWS, ODA, TMC, TDC, IH, RP, PIN, SLC, LINKAGE, EPP, ECC, FFG, SPS, ODA
Data sets	16

Stereo Encoder Module

Stereo MPX Signal

Channel separation	L $\leftrightarrow$ R >70 dB at 1 kHz; L $\leftrightarrow$ R >60 dB at 20 Hz – 15 kHz; M $\leftrightarrow$ S >60 dB
Frequency response	20 Hz – 15 kHz <0.15 dB
Pilot rejection	> 70 dB
SNR	> 80 dB
THD	< 0.05 %
Pilot frequency	19 kHz $\pm$ 1 Hz
Pilot magnitude	2.5 kHz – 10 kHz
Pilot phase	-5 – +5° in steps of 0.1° – adjustable to 38 kHz-subcarrier
Preemphasis	off, 50 μ s, 75 μ s
Limiter	Peak: 50 – 100 kHz; Power: -3 – +3 dBr according to BS.412-9



Technical Details (3/4)

Codecs

PCM

Bit depth	12–16, 20, 24 bit
Bitrate	2.4–4.6 Mbit/s
FEC	RIST, ProMPEG FEC #3 release 2

μMPX

Bitrate	320, 384, 448, 576, 800 kbit/s
FEC	μMPX FEC, RIST, ProMPEG FEC #3 release 2

Control and monitor

GUI and Interfaces

User interface	Integrated WebGUI, LCD display
Protocols	HTTP(S), FTP, Telnet, Ember+, JSON, NMS, NMOS, SNMP

Front Panel

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

Expansion

Tuner

Satellite	2x 75 Ω F-type (optional)
FM/DAB	2x 75 Ω F-type (optional)

General Data

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



Technical details (4/4)

Internal Storage (Optional)

Data	Internal audio or MPX files (optional)
Size	7 GB (optional 1000 GB)
Type	eMMC (optional SSD)

Power Supply

Standard AC	1 internal IEC power connector voltage range 90 – 260 VAC (nominal 100 – 240 VAC) frequency range 47 – 63 Hz (nominal 50 – 60 Hz)
Standard DC (optional)	1 internal (Neutrik powerCON) voltage range -40 – -60 VDC (nominal -48 VDC)
Dual internal (optional)	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) DC: -40 – -60 VDC (nominal -48 VDC)
Dual hot-plug (optional)	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) DC: -40 – -60 VDC (nominal -48 VDC)



Options (1/3)

MPX-1g Base Unit Variations

You can choose between the following base unit variations:

Article no.	Name
VER66001	Base unit MPX-1g with 1x internal AC power supply
VER66002	Base unit MPX-1g with 2x internal AC power supplies
VER66003	Base unit MPX-1g with slot for 2x hot-plug power supply • 2x hot-plug power supplies AC / DC not included. • Please order 2 hot-plug power supplies AC (VER45851) or DC (VER45852).

MPX-1g 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
VER66013	Dual sat tuner	DVB-S/S2 QPSK/8PSK/16APSK/32APSK (A+B parallel, for connection of 2 sat antennas.) • Sat tuner as audio/MPX input for processing purposes • MPE (Multiprotocol Encapsulation) coding included • Professional DVB-S2-Features: multi-streaming, VCM/ACM, PL • Scrambling, optional: GSE • supported symbol rates: 64 kSym/s – 45 MSym/s Requires option MPX/audio decoder (VER66016).
VER66022	FM/DAB tuner	FM/DAB multi-band tuner for rebroadcasting, monitoring & control • FM/DAB tuner as audio input • Can be combined with FM (RDS) / DAB (PAD) Databridge (VER66023). • dual tuner with 75Ω F-type connector input • Controllable via web interface, alarm messages via SNMP or relay Requires option MPX/audio decoder (VER66016).
VER65120	Internal SSD storage	128 GB internal SSD storage
VER45851	Hot-plug AC power supply	Power supply with automatic switchover in case of failure. • 90 – 260 VAC (nominal 100 – 240 VAC), • 47 – 63 Hz (nominal 50 – 60 Hz)
VER45852	Hot-plug DC power supply	Power supply with automatic switchover in case of failure. • 40 – -60 VDC (nominal -48 VDC)



Options (2/3)

MPX-1g Software Options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER66010	RDS coder	RDS standards: UECP 7.05 compliant, CENELEC EN50067 • RDS coder with UECP fully dynamic data via IP or serial interface. • RDS configuration and monitoring via web interface, ARCOS Config (basic functions) or ARCOS Network for RDS encoder fleet. • Up to 16 Datasets available. • Scrolling PS to show messages of up to 160 characters. • Built-in RDS decoder for live view / RDS Lab. • Enables replacement of RDS data in the MPX/ composite signal.
VER66011	Stereo generator	MPX-Stereo Generator • Software-controlled signal synthesis and modulation control. • Configurable filter settings for monitoring or rebroadcast. Optional: (VER66017)
VER66017	MPX limiter (*)	Calculation and adjustment of modulation power and peak deviation. (*) Requires option Stereo generator (VER66011).
VER66016	MPX/audio decoder	• Audio over IP (optional Sat) as input source for the optionally available stereo encoder. MPX over IP (optional Sat) as MPX rebroadcast source for the optionally available RDS encoder.
VER66018	MPX IP-encoder	Encoding of the internal generated MPX signal for IP transmission. Codecs: PCM (optional µMPX)
VER66012	Ravenna, AES67, PTP (*)	According to the standard Ravenna of audio over IP interoperability (*) Option MPX IP-Encoder (VER66018) or MPX / Audio Decoder (VER66016) required
VER66023	FM (RDS) / DAB (PAD) Databridge (*)	Enables forwarding of • dynamic RDS data from the FM tuner, • dynamic PAD and signaling data from the DAB tuner to the RDS encoder for retransmission. (*) Option VER66022 FM/DAB tuner required
VER66024	Automatic backup switching between encoder and decoder	Enables automatic backup switching between MPX encoder and RDS/Stereo decoder mode. This option needs options stereo generator (VER66011), RDS coder (VER66010) and MPX/Audio decoder (VER66016).



Options (3/3)

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. (*) Option MPX IP-Encoder (VER66018) required
VER69013	μMPX decoder - MPX decompression (*)	Algorithm to decompress the full MPX/composite signal, including pilot and RDS from IP to MPX. 5 available bitrates: 320 and 800 kbps.max. (*) Option MPX / Audio Decoder (VER66016) required
VER68013	SFN (Single-frequency network) Accuracy	Synchronization of MPX streams for FM-SFN networks < 1 μs accuracy with 1PPS for SFN operation - includes SPN functionality (NTP synchronization with 20 ms accuracy)
VER66025	SPN (Synchronized Playout Network)	Output synchronization via NTP time server. - Accuracy: 20 ms - Price per unit.
VER66015	Analog XLR audio output L/R	- Output of the analog stereo encoder input, without Preemphasis - Switchable: deactivates both digital MPX-outputs (XLR).
VER68012	Dual Streaming	Simultaneous transmission and reception of 2 IP streams and seamless exchange of IP packages in case of failure
VER66019	SRT/RIST decoder	- SRT functionality for decoder according to SRT standard of the SRT Alliance (including UDP). - RIST functionality for decoder according to IETF standard "RIST Simple Profile" and RFC 4585.
VER66020	SRT/RIST encoder	- SRT functionality for encoder according to SRT standard of the SRT Alliance (including UDP). - RIST functionality for encoder according to IETF standard "RIST Simple Profile" and RFC 4585.
VER66026	Live Listening	Audio monitoring via web interface or any web stream client.