

RF-10e

FM/DAB+ Receiver

Highlights

- ▶ Professional 10-channel FM/DAB+ receiver
- ▶ MPEG-2 Transport Stream and ASI gateway
- ▶ Multi-format audio streaming encoder



RF-10e – FM/DAB+ Receiver (1/2)

FM / DAB+ audio distribution via IP or DVB-ASI

The RF-10e is a 10-channel receiver for FM and DAB+. It encodes the received audio signals for distribution as Audio over IP, MPEG-2 TS or DVB-ASI.

Hardware

- ▶ Combined RF interfaces for DAB & FM reception
- ▶ Multiple, free programmable, freely combinable, and redundant outputs (2 IP ports, 2 ASI ports)

Audio coding – fitting to your needs

High quality multi-format audio encoding

- ▶ MPEG 1/2 Layer 1, 2, 3
- ▶ G.711, G.722, PCM
- ▶ Opus
- ▶ Ogg Vorbis
- ▶ MPEG 2/4 AAC LC, HEv1 & v2
- ▶ MPEG 4 AAC LD/ELD/ELDV2
- ▶ Extended HE-AAC (xHE-AAC)
- ▶ Enhanced aptX (E-aptX)
- ▶ Dolby Digital Pro / E encoder supporting AC3, Dolby E, Dolby Digital (DD) and Dolby Digital Plus (DD+)*

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 audio IP streaming using UDP, RTP and SIP / SDP (standardized by EBU N / ACIP Tech 3326)
- ▶ PRO MPEG FEC, Dual streaming
- ▶ Livewire / Ravenna (SIP, SAP, RTSP, AES67)*
- ▶ TS RTP, UDP and SRT streaming
- ▶ SRT Secure Reliable Transport
- ▶ HLS, Icecast source client*

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



RF-10e – FM/DAB+ Receiver (2/2)

Backup / advanced redundancy management

- ▶ Dual IP ports for data + 1 IP port for control interface
- ▶ Redundant power supply 230 VAC or 48 VDC*

Control

- ▶ Remote control with various possibilities: HTTP/S, SFTP, Telnet, NMS, SNMP
- ▶ Revised configuration via web user interface for easier setup
- ▶ SNMP v2c / v3, relays, inputs

Special

- ▶ Energy efficient 24/7 broadcast quality
- ▶ RDS decoding (built in RDS / UECP decoder)
- ▶ Embedded auxiliary data (RBDS / RDS or PAD) and GPIO forwarding
- ▶ Perfect network synchronization for SFN*

Monitoring

- ▶ MPEG parameters via SNMP v2c and relay
- ▶ Headphone output
- ▶ Icecast Live Listening*
- ▶ FM RDS monitoring and optional alarm control (PI, PS)

Advanced control functionalities

- ▶ HTTP/HTTPS: via web interface
- ▶ NMS: Control via centralized network management system

Advanced IP robustness functionalities

- ▶ Operates under stressful network conditions
- ▶ PRO MPEG FEC
- ▶ Management of packet size, buffer and QoS

Perfect latency management

- ▶ GPS/1PPS based 2wcom latency control solution usage in SFN FM networks*

Highly sophisticated monitoring and alarm concept

- ▶ Adjustable silence detection
- ▶ IP buffer and jitter check
- ▶ SNMP, alarm & event logging

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



Technical details (1/3)

Input

RF

Connector	10 x F connector female
Impedance	50 Ω
Frequency range (FM)	87.5 – 108.0 MHz 76.0 – 90.0 MHz (Japan) 50/100 kHz steps
RF sensitivity (FM) (S/N 40 dB, stereo)	35 dB μ V
Max. RF input (FM)	120 dB μ V
Frequency range (DAB)	168 – 240 MHz (Band III)
RF sensitivity (DAB)	10 dB μ V
Max. RF input (DAB)	100 dB μ V

Audio (encoder)

Codecs

Standard	Linear PCM, G.711, G.722 Opus, Ogg Vorbis MPEG 1/2 Layer 2, 3 MPEG-2/MPEG-4 AAC-LC, MPEG-4 HE-AAC v1 & v2, MPEG-4/MPEG-D xHE-AAC MPEG-4 AAC-LD/ELD/ELdV2 Enhanced aptX (E-aptX) Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3), Dolby E on request. (optional) MPX (optional)
Sample rates	8, 16, 32, 44.1, 48 kHz



Technical details (2/3)

Interfaces

Audio

Headphone (out)	L/R, < 10 Ω, 6,3 mm
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Ethernet

Data	Audio, controlling and setup functions
Connector	3x RJ45
Type	Auto switching 10/100/1000 BASE-T
Protocol	RTP/RTCP/UDP, IGMP, ICMP, DHCP, HTTP, SFTP, SNMPv2c, SNMPv3, NTP, TCP (Icecast), HLS

Transport stream

ASI IN	BNC – 75 Ω
ASI OUT	BNC – 75 Ω

Contact closure

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

Time synchronization (optional)

PTPv2	Network synchronization according to IEEE 1588-2008
SYNC IN	BNC – 75 Ω - 1PPS
SYNC OUT	BNC – 75 Ω - 1PPS

Control & monitor

Ethernet

Data	Control and setup functions
Protocol	2wcom NMS, Telnet, HTTP/HTTPS, UDP, IGMP, ICMP, DHCP, SFTP, SNMPv2c, SNMPv3

Front Panel

Display: LCD	Graphical, 264x64 pixel
Jog wheel	Impulse, enter button
4 Duo LEDs	Power, input, output, warning



Technical details (3/3)

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 (aluminum-zinc coated)
Operating temp. range	0 – +45°C
Storage temp. range	-40 – +70°C
Languages	English

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)
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)
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)

Internal storage

Data	internal audio files
Size	7 GB (optional 1000 GB)



Options (1/2)

RF-10e base unit variations

Base unit does not contain any tuners or channels. You can choose between the following base unit variations:

Article no.	Name
VER63801	Base unit RF-10e with 1x internal AC power supply
VER63802	Base unit RF-10e with 2x internal AC power supplies
VER63803	Base unit RF-10e with slot for 2x hot-plug power supply <ul style="list-style-type: none">▶ 2x hot-plug power supplies AC / DC not included.▶ Please order 2 hot-plug power supplies AC (VER45851) or DC (VER45852).

RF-10e 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
VER63811	FM/DAB tuner (*)	Installation of 1 tuner module for 2 channels each (max. 5 modules for a total of 10 channels per RF-10e unit). <ul style="list-style-type: none">▶ FM/DAB/HDR multi-band tuner for rebroadcasting, monitoring & control▶ Dual tuner with 75 Ω F-Type connector input▶ Alarm messages via SNMP or relay (*) The tuner channels must be activated via software option VER63810.
VER65120	Internal SSD storage	128 GB internal SSD storage
VER45851	Hot-plug AC power supply	Power supply with automatic switchover in case of failure. <ul style="list-style-type: none">▶ 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. <ul style="list-style-type: none">▶ 40 – -60 VDC (nominal -48 VDC)

RF-10e software options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER63810	Activation of tuner channels	Activation of 2 tuner channels for RF-10e unit incl. all ordered audio codecs. Requires hardware option VER63811 for 1 tuner module per 2 tuner channels.
VER63015	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.



Options (2/2)

Article no.	Name	Description
VER63001	Ravenna, AES67, PTP	According to the standard Ravenna of audio over IP interoperability (including AES67, SAP, RTSP, PTP). Price per activated channel. Price per activated channel.
VER63012	Livewire+	According to the standard of audio over IP interoperability Livewire+ (Including AES67, LWRP, LWCP, Livewire Advertisement). Price per activated channel.
VER63013	Live listening	The audio data is sent as a stream on request of a client in the network (e.g. decoder). Button in the web interface also starts this stream directly to the requesting browser. Price per activated channel.
VER63017	SRT/RIST encoder	<ul style="list-style-type: none">▶ 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. Price per activated channel.
VER63016	SRT/RIST decoder	<ul style="list-style-type: none">▶ 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. Price per activated channel.
VER65116	HLS encoder	Adds HLS, HTTP Live Streaming encoder function. <ul style="list-style-type: none">▶ per stereo channel)▶ Max number of output coding qualities and number of playlists per container: 2 per activated channel Price per activated channel.
VER63018	Dolby Digital Pro encoder	Supports Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3). Support of Dolby E on request. Price per activated channel.
VER63812	H.264 video encoder for TS still image	Generates video PID with still image from uploaded image file (e.g. PNG, JPG). Price per activated channel.