

RF-10e

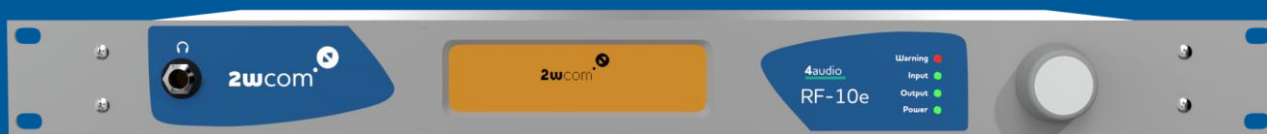
10-channel FM/DAB+ receiver

Datasheet

Highlights

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

RF-10e – FM/HD Radio/DAB+ Receiver



The RF-10e is a 10-channel receiver for FM, HD Radio and DAB+. It encodes the received audio signals for distribution as Audio over IP, MPEG-2 TS or DVB-ASI. As a re-distribution encoder, it can serve a number of applications, such as audio transcoding cable networks, re-encoding for Audio over IP (AoIP) and streaming.

Flexible in Application – Pay as You Grow

- Versatile in serving various use cases
- Upgradeable with hardware and software options according to your needs
- Combined RF tuner for FM, DAB and HD Radio® reception
- Can be equipped with up to 5 dual tuners

Versatile Compatibility – Complete Audio Codec Support

- Comprehensive codec support for unmatched interoperability (see Specifications)
- Adaptability for audio contribution in varied network conditions with codecs like Opus, Enhanced aptX (E-aptX) and xHE-AAC.
- Optimized studio-to-transmitter links (STL) with efficient coding formats like MPEG-Layer 2 and AAC-LC; ensure highest fidelity and minimal latency with bit-transparent transmission of digital audio
- Professional audio streaming: Efficient generation of web streams supporting mp3, OGG, Opus and the complete AAC family
- Specialized broadcasting support: Integrates seamlessly with Dolby-enabled systems (AC-3, E-AC-3)* and enables DAB+ encoding* with specialized options

There are certain limitations to some AoIP format and streaming combinations, which may result in the CPU capacity not supporting all 10 possible channels. If you have any further questions, please do not hesitate to contact us.

*optional



Audio over IP Streaming

- 2wcom provides robust network connections by combining multiple proven technologies to deliver your audio even in stressful conditions.
- Unicast, multiple unicast, and multicast for maximum network control
- Proven multimedia transport protocols such as UDP, RTP and RTSP
- Well-established audio protocols such as AES67, SMPTE ST 2110, Livewire and RAVENNA*
- Support of HLS, Icecast Source Client and Icecast Server for web streaming
- Receive audio from Icecast Source Client und Icecast Server

Advanced Streaming Robustness – Unmatched Broadcast Resilience

- PRO MPEG Forward Error Correction (FEC) and dual streaming for resilient, redundant streams
- Secure and reliable streaming over unpredictable networks with Secure Reliable Transport (SRT)* and Reliable Internet Stream Transport (RIST)
- Manage packet size, buffering, and Quality of Service (QoS) for a robust streaming performance
- Multiple redundancy options and source switching for uninterrupted streaming including Dual Streaming and Stream4Sure

Reliable and Uninterrupted Operation

- 2 dedicated IP interfaces for data transmission, along with an extra IP interface for control, allow a dependable IP streaming experience.
- All 3 IP interfaces can be flexibly configured for either data transmission or control.
- Redundant power supplies (90 – 260 VAC or 48 VDC) provide a fail-safe system, ensuring continuous operation even during a power supply failure.

User-Friendly and Streamlined Access

- Modern and easy-to-use web interface
- Uniform operating concept across all 2wcom devices for maximum usability
- LCD menu for direct on-site access
- Audio monitoring via web interface or any web stream client with Live Listening

Smart Management and Seamless Integration

- Well-established APIs and physical control seamlessly integrate into your current infrastructure: Rest API, Ember+, SNMP, NMOS, and GPI
- Stay informed: Flexibly configurable alarm events and notifications over SNMP, GPO, and front panel LED

*optional



Verified IP Security

- High-level security within open IP infrastructures
- Thoroughly examined by independent audit authorities through whitelist/blacklist penetration tests



Formats and Protocols

Audio

Codecs (included)	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)
Codecs (optional)	Dolby Digital (AC-3) Dolby Digital Plus (E-AC-3) Dolby E (on request) MPX
Sample rates	8, 16, 32, 44.1, 48 kHz

MPX (optional)

Format	PCM raw
Bit depth	12, 13, 14, 15, 16, 20, 24 bit
Bitrates	2.4 – 4.6 Mbit/s (without FEC)
Sample rates	132, 192 kHz

Streaming

IP protocols	TCP, UDP unicast, multiple unicast & multicast
Audio over IP formats	RTP (RFC 3550, RFC 3551, RFC 3640, RFC 2250) SIP/SAP according to EBU Tech 3326 SMPTE ST 2110 (optional) AES67 based on RAVENNA, Livewire, or Dante (optional) Livewire / RAVENNA (SAP, RTSP, AES67, PTP, PTPv2) (optional)
Web streaming	Icecast/Shoutcast Client Icecast Source Client Icecast Server HLS encoder (optional)

Specifications



Transmission robustness	SRT, RIST Pro-MPEG FEC #3 release 2 Dual Streaming Adaptive bitrate switching, source switching concept, management of packet size, buffers, QoS
-------------------------	---

Synchronization

Internal	free-running
External	1PPS, PTP, PTPv2, NTP, digital reference input
Sample rate converter	Asynchronous, any ratio

Interfaces

Audio

Connector	10x F type connector female
Impedance	75 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



Interface Extensions

FM/DAB/HD Radio® tuner (optional)	10x 75 Ω F-type
ASI input (optional)	75 Ω BNC socket, 270 Mbit/s, MPEG2 TS
ASI output (optional)	75 Ω BNC socket, 270 Mbit/s, MPEG2 TS

Ethernet

Connector	3x RJ45 (1x Control, 2x Data)
Type	Auto-switching 10/100/1000 BASE-T

Synchronization

1PPS input	75 Ω BNC socket
1PPS output	75 Ω BNC socket

Serial and GPIO

USB	USB 2.0 interface for service, configuration, and firmware updates
GPIO	26 pole D-Sub male; combined connector for inputs (GPI) and outputs (GPO)

Internal Storage

Size	7 GB (optional 128 GB)
Type	eMMC (optional SSD)

Front Panel

Headphone	6.3 mm / 1/4" socket, < 10 Ω
LEDs	Power, Input, Output, Warning
Operation	Display and Jog Wheel
Display	LCD, graphical, 264x64 pixel

General Data

Integrated Web GUI

Languages	English
Web technologies	HTML5, Java Script

Device

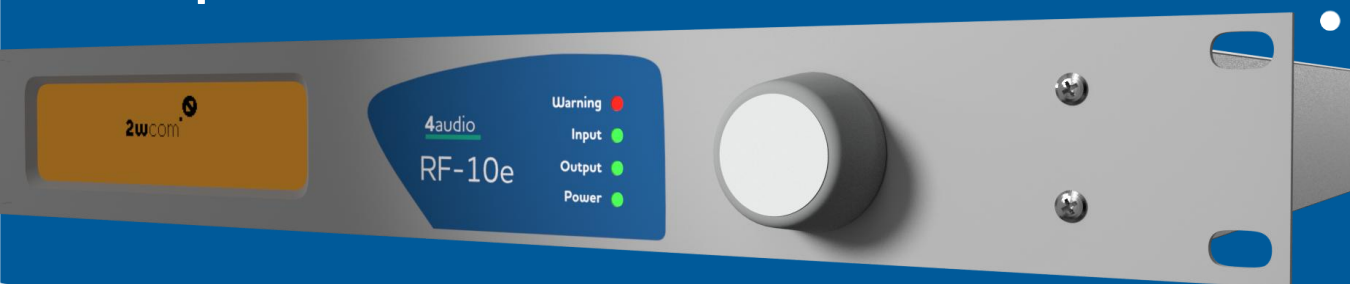
Power consumption	< 20 W
Case dimensions	19", 1 RU, depth: 310 mm, width: 424 mm, front panel: 484 mm
Weight	< 5 kg
Material	Steel plate, aluminum-zinc coated
Operating temp. range	0 – +45 °C
Storage temp. range	-40 – +70 °C



Power Supply

Standard AC	1x 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)	2x 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)	2x 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



RF-10e Base Unit Variations

To customize your device, start by selecting a base unit variation, then choose from our range of hardware and software options to fit your needs. Each unit includes one audio channel by default. You can choose from 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 supplies Note: 2x hot-plug power supplies AC/DC not included. Please order 2x hot-plug power supplies AC (VER45851) or DC (VER45852).

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/HD Radio® tuner (F-type) (*)	Installation of 1 tuner module for 2 channels each (max. 5 modules for a total of 10 channels per RF-10e unit). - Multi-band tuner supporting FM, DAB and HD Radio® for rebroadcasting, monitoring and control - Dual tuner with 75 Ω F-type connector input - Alarm messages via SNMP or relay (*) Requires option Activation of tuner channels (VER63810).
VER65120	Internal SSD storage	128 GB internal SSD storage
VER45851	Hot-plug AC power supply	Power supply with automatic switch over 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 switch over in case of failure. 40 – -60 VDC (nominal -48 VDC)



Software Options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER63810	Activation of tuner channels (*)	Activation of 1 stereo channel for RF-10e unit including all ordered audio codecs. (*) Requires option FM/DAB/HD Radio® tuner (F-type) (VER63811) for 1 tuner module per 2 stereo channels.
VER63016	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. Price per activated channel.
VER63017	SRT/RIST encoder	SRT functionality for encoder 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.
VER63015	MPEG-2 TS encoder	Encoding of a MPEG-2 TS (transport stream) according to ISO/IEC 13818-1 or ITU-T Rec. H.220.0. 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.
VER65116	HLS encoder	Adds HLS, HTTP Live Streaming Encoder function. Max. number of output coding qualities and number of playlists per container: 2 per activated channel. Price per activated stereo channel.
VER63001	RAVENNA, AES67, PTP	Audio output according to the RAVENNA technology for audio over IP interoperability (including AES67, SAP, RTSP, PTP, PTPv2). 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.
VER63812	H.264 video encoder for TS still image	Generates video PID with still image from uploaded image file (for example PNG, JPG). Price per activated channel.