SAT-4da
DVB Audio Satellite Receiver

Datasheet

Highlights

- Professional DVB-S/S2/S2X audio receiver
- Multi-format 4-channel audio decoder
- Full analog and digital stereo support with 8 XLR outputs

Your audio. Our solution.

2wcom

SAT-4da – DVB Audio Satellite Receiver

SAT-4da is a multi-format 4-channel audio satellite receiver. It is perfect for high-density analog installations, coming with 8 XLR outputs to support up to 4 analog stereo channels. You can choose between two different satellite tuners. The advanced single tuner supports DVB-S/S2 and the dual tuner supports DVB-S/S2/S2X. The SAT-4da is ideal for radio studios and transmitter sites and includes 3 backup sources to ensure an uninterrupted audio distribution.

Flexible in Application – Pay as You Grow

- Optimized for broadcast distribution over satellite
- Expandable to up to 4 channels, allowing you to pay only for as many as needed
- Full 4-channel support for digital audio, L/R analog audio or mixed operation of analog and digital audio
- Upgradeable with hardware and software options according to your needs

Multi-Standard Satellite Reception and Processing

- Choice between the default dual tuner and the optional advanced tuner: both support DVB-S/S2
- Additional support of DVB-S2X with the default dual tuner
- Optional support of low symbol rates starting at 64 kSym/s with the advanced tuner
- Support of multiple demodulation standards like 8PSK, 16APSK and 32APSK
- Transfer of SAT data over IP via MPE-Forwarding (optional for both tuners) and GSE (advanced tuner only)
- ASI output and input to process transport streams

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SAT-4da – DVB Audio Satellite Receiver

Versatile Compatibility – Complete Audio Decoder Support

- Comprehensive codec support for unmatched interoperability (see Specifications)
- 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
- Flexibility for IP based backup feeds with codecs like Opus, Enhanced aptX (E-aptX) and xHE-AAC
- Professional audio streaming: Decoding 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)* with specialized option

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
- De-multiplex and decode from MPEG-TS over IP
- Well-established audio protocols such as AES67, SMPTE ST 2110, Livewire and RAVENNA*
- Receive audio from HLS, MPEG DASH, 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

Perfect Audio Latency Management – Ensuring Precise Synchronization

- SPN (Synchronous Playout Network): Uses NTP (Network Time Protocol) to synchronize audio input and output across devices, preventing timing drifts (for example, at transmitter sites) with a precision of < 20 ms
- SFN (Single Frequency Network)*: Uses 1PPS for a precision of < 10 µs, enabling SFN operation for FM broadcasting

*optional

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SAT-4da – DVB Audio Satellite Receiver

Reliable and Uninterrupted Operation

- Flexible backup concept with automatic switching between 1 main source and 3 backup sources. Backups can be any kind of input source, including internal storage, physical interfaces, and web stream.
- 2 dedicated IP interfaces for data transmission, along with an extra IP interface for control, allow a dependable IP streaming experience.
- 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

Verified IP Security

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

Specifications

Reception

Satellite Tuner

	Dual DVB-S/S2/S2X Tuner (default)	Advanced DVB-S/S2 Single Tuner (optional)
Connector RF1	F connector female (input)	F connector female (input)
Connector RF2	F connector female (2nd input)	F connector female (loop-through)
Frequency range	950 – 2.150 MHz, in 1 kHz steps All LNB oscillator frequencies possible	950 – 2.150 MHz, in 1 kHz steps All LNB oscillator frequencies possible
Input level, impedance	-75 – -20 dBm, 75 Ω	-75 – -20 dBm, 75 Ω
LNB Control	13 V vertical, 18 V horizontal, off 0 kHz low band, 22 kHz high band	13 V vertical, 18 V horizontal, off 0 kHz low band, 22 kHz high band
Noise figure	Typically 6 dB, max. 12 dB	Typically 6 dB, max. 12 dB
DVB-S Demodulation/ Decoding	QPSK: 1/2, 2/3, 3/4, 4/5, 5/6, 7/8 CCM VITERBI and Reed-Solomon decoder DIRECTV™ (DSS) compliant	QPSK: 1/2, 2/3, 3/4, 4/5, 5/6, 7/8 CCM VITERBI and Reed-Solomon decoder DIRECTV™ (DSS) compliant
DVB-S2/S2X Demodulation/ Decoding	QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10 Roll-off 0.05 – 0.35 Normal frames only (no short frames) CCM / VCM / ACM LDPC and BCH decoder S2 Professional Profile/S2X Broadcast Profile	QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10 Roll-off 0.20 / 0.35 CCM / VCM / ACM LDPC and BCH decoder S2 Professional Profile
Symbol rates	QPSK, 8PSK, 16APSK: 1 – 45 MSym/s 32APSK: 1 – 40 MSym/s	QPSK, 8PSK, 16APSK: 0.64 – 45 MSym/s 32APSK: 0.64 – 38 MSym/s

Specifications

Data processing	single and multiple MPEG TS GSE-HEM (S2X only) – on request	single and multiple MPEG TS single and multiple GSE
PL scrambling	ID 0 - 262144	ID 0 - 262144
IF Filter bandwidth	Automatic selection	Automatic selection
MPEG decoding	according to ETSI TR 101 154	according to ETSI TR 101 154

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)
Sample rates	16, 22.05, 24, 32, 44.1, 48 kHz (On request: up to 192 kHz)

Specifications

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, PTPv2) (optional) MPEG-TS
Web streaming	Icecast/Shoutcast Client
Transmission robustness	SRT, RIST Pro-MPEG FEC #3 release 2 Dual Streaming 2wcom Stream4Sure µMPX FEC Adaptive bitrate switching, source switching concept, management of packet size, buffers, QoS

Synchronization

Internal	free-running
External	1PPS, PTP, PTPv2, NTP, digital reference input
Decoder synchronization between different devices	< 20 ms using SPN via NTP (optional) < 1 µs using SFN via 1PPS or PTP (optional)
Sample rate converter	8:1 (with bypass modes)

Interfaces

Audio

Digital (out)	4x AES/EBU, 110 Ω balanced integrated XLR male, shared with analog out (configurable)
Analog (out)	4x 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	+9 dBU
Digital reference level	-9 dBFS
Adjustable gain	20 – +6 dB
Harmonic distortion	< 0.05 % / < -66 dB (40 Hz – 10 kHz)
Dynamic range	16 Bit: > 89 dB; 24 Bit: > 130 dB
Frequency response	Depends on sample rate. For example: 48 kHz: 0.1 dB; 20 Hz – 22.5 kHz

Specifications

Interface Extensions

ASI input	75 Ω BNC socket, 270 Mbit/s, MPEG2 TS Note: Configurable to be either ASI input or 1 PPS SYNC input.
ASI output	75 Ω BNC socket

Ethernet

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

Synchronization

1PPS input	75 Ω BNC socket Note: Configurable to be either 1PPS SYNC input or ASI input.
GPS (optional)	75 Ω BNC socket
10 MHz output (optional)	50 Ω SMA socket, from GPS module
1PPS output (optional)	75 Ω BNC socket, from GPS module

Serial and GPIO

DTE	15 pole D-Sub male connector for serial RS-232C data communication
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. For Live Listening
LEDs	Power, Input, Output, Warning
Operation	Display and Jog Wheel
Display	LCD, graphical, 264x64 pixel

Specifications

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)
Standard DC (optional)	1x internal (Neutrik powerCON) voltage range -40 – -60 VDC (nominal -48 VDC)
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

SAT-4da 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 and the Dual DVB-S/S2/S2X Tuner by default. You can choose from the following base unit variations:

Article no.	Name
VER63701	Base unit SAT-4da with 1x internal AC power supply
VER63702	Base unit SAT-4da with 2x internal AC power supplies
VER63703	Base unit SAT-4da 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
VER63613	Advanced single satellite tuner (*)	DVB-S/S2 low symbol rate single tuner module with additional loop-through output • QPSK, 8PSK, 16APSK, 32APSK • Supported symbol rates: 64 kSym/s – 45 MSym/s • GSE Support (*) Replaces default tuner
VER65120	Internal SSD storage	128 GB internal SSD storage
VER63009	Breakout cable RS232 8-times	Cable for in- and output of 8 ancillary data (for example UECP RDS data) via RS232 cable.
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)

Options

Software Options

Please note that software options can be retrofitted remotely.

Article no.	Name	Description
VER63610	Activation of additional audio channel	Activation of additional audio channel of the base unit incl. all ordered audio codecs. The third and fourth channels are only available as digital channels.
VER63614	Audio-Backup IP-input - Icecast	IP-Audio streaming input as an additional backup solution. Icecast/Shoutcast Client. Price per unit.
VER63615	Audio-Backup File playout	File playout from internal memory as an additional backup solution. Price per unit.
VER63617	BISS Descrambling	Descrambling of BISS-1 and BISS-E according to EBU-Tech 3292 rev. 2. Price per unit.
VER63001	RAVENNA, AES67, PTP	Audio output according to the RAVENNA technology for audio over IP interoperability (including AES67, SAP, RTSP, PTP). 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.
VER63003	SFN (single frequency network)	Perfect timing and network synchronization for SFN applications.
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.
VER63019	Dolby Digital Pro Decoder	Supports Dolby Digital (AC-3), Dolby Digital Plus (E-AC-3). Support of Dolby E on request. Price per activated channel.
VER63028	HLS decoder	Adds HLS, HTTP Live Streaming Decoder function. Price per activated stereo channel.
VER63024	MPE	MPE (Multiprotocol Encapsulation) encoding/decoding. Price per unit.

Options

Article no.	Name	Description
VER63025	TS forwarding over IP	TS Forwarding enables the forwarding of a complete TS or MPE-forwarding (required MPE Option VER63024). The SAT tuner is used as source. Price per activated channel.
VER63029	Loudness measurement	Loudness measurement for the audio outputs according to EBU R128 and ITU-R BS.1770/BS.1771. Measures and displays momentary/short-term/integrated loudness, loudness range (LRA) and True Peak (dBTP). Price per activated channel.