

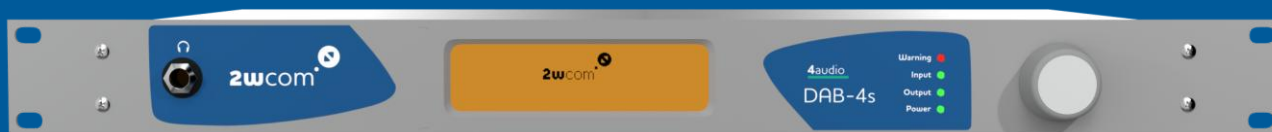
# DAB-4s EDI/ETI Satellite Receiver and Converter

## Datasheet

### Highlights

- Multiformat EDI/ETI and ETI/EDI converter for up to 4 channels
- High-density DAB distribution extractor
- EDI/ETI extraction from DVB-S/S2 and MPEG-TS ASI

# EDI/ETI Satellite Receiver and Converter



The DAB-4s is a professional DAB EDI/ETI satellite receiver and converter for up to 4 DAB multiplexes. It demodulates up to 4 EDI/ETI data streams from DVB-S/S2/S2X. The DAB-4s can flexibly be configured as 4x EDI/ETI converter, 4x ETI/EDI converter or 4x EDI level converter. Additionally, it monitors all EDI/ETI streams. A pair of input sources ETI/EDI can work together in a redundant master/slave configuration.

## Flexible in Application – Pay as You Grow

- Versatile in serving various use cases
- Upgradeable with hardware and software options according to your needs

## Multi-Standard Satellite Reception and Processing

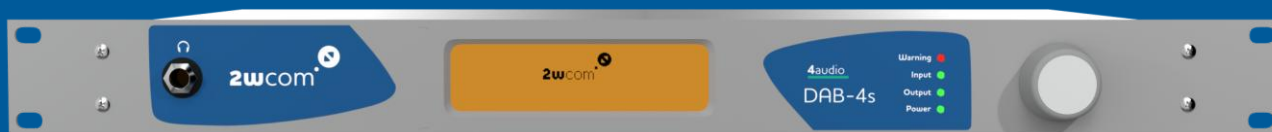
- Choice between the default basic tuner and the optional dual tuner: both support DVB-S/S2
- Additional support of DVB-S2X with the optional dual tuner
- Support of multiple demodulation standards like 8PSK, 16APSK and 32APSK
- Transfer of SAT data over IP via MPE-Forwarding and GSE
- ASI output and input to process transport streams

## Dedicated to your use case

The DAB-4s can be customized with a variety of different features:

- Receive DAB feeds over satellite at transmitter stations
- Convert EDI to ETI (NI or NA) for interoperability between IP-based distribution and existing ETI chains
- Forward MPE and GSE streams directly from Transport stream to IP
- Encode and decode EDI via SRT for stable DAB feeds over unmanaged networks
- Redundancy and backup switching
- Freely assign inputs to converters and converters to outputs
- Configure ETI inputs as additional outputs (mirrored routing)
- Integrated DAB monitoring with optional tuner
- Optional power-down relays for fail-safe ETI bypass

# EDI/ETI Satellite Receiver and Converter



## Advanced Streaming Robustness – Unmatched Broadcast Resilience

- Forward Error Correction (FEC) and dual streaming for resilient, redundant streams
- Secure and reliable streaming over unpredictable networks with Secure Reliable Transport (SRT)\*
- Manage packet size, buffering, and Quality of Service (QoS) for a robust streaming performance

## 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

## 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

\*optional



## Reception

### Satellite Tuner

|                                    | Basic DVB-S/S2 Single Tuner (default)                                                                                                                                | Dual DVB-S/S2/S2X Tuner (optional)                                                                                                                                                                                                                                                                                                                     |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector RF1                      | F connector female (input)                                                                                                                                           | F connector female (input)                                                                                                                                                                                                                                                                                                                             |
| Connector RF2                      | F connector female (loop-through)                                                                                                                                    | F connector female (2 <sup>nd</sup> input)                                                                                                                                                                                                                                                                                                             |
| Frequency range                    | 950 – 2.150 MHz, in 1 kHz steps<br>All LNB oscillator frequencies possible                                                                                           | 950 – 2.150 MHz, in 1 kHz steps<br>All LNB frequencies possible                                                                                                                                                                                                                                                                                        |
| Input level, impedance             | -75 – -20 dBm, 75 $\Omega$                                                                                                                                           | -75 – -20 dBm, 75 $\Omega$                                                                                                                                                                                                                                                                                                                             |
| LNB Control                        | 13 V vertical, 18 V horizontal, off 0 kHz<br>low band, 22 kHz high band                                                                                              | 13 V vertical, 18 V horizontal, off 0 kHz<br>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<br>CCM<br>VITERBI and Reed-Solomon decoder<br>DIRECTV™ (DSS) compliant                                                            | QPSK: 1/2, 2/3, 3/4, 4/5, 5/6, 7/8<br>CCM<br>VITERBI and Reed-Solomon decoder<br>DIRECTV™ (DSS) compliant                                                                                                                                                                                                                                              |
| DVB-S2 / S2X demodulation/Decoding | QPSK: 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 8/10<br>8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10<br><br>Roll-off 0.35<br>CCM<br>LDPC and BCH decoder<br><br>S2 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<br>8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10<br>16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10<br>32APSK: 3/4, 4/5, 5/6, 8/9, 9/10<br><br>Roll-off 0.05 – 0.35<br>Normal Frames only (no short frames)<br>CCM / VCM / ACM<br>LDPC and BCH decoder<br><br>S2 Professional Profile / S2X Broadcast Profile |
| Symbol rates                       | 1 – 45 MSym/s                                                                                                                                                        | QPSK, 8PSK, 16APSK: 1 – 45 MSym/s<br>32APSK: 1 – 40 MSym/s                                                                                                                                                                                                                                                                                             |
| Data processing                    | single and multiple MPEG TS<br>MPEG TS (EDI MPE)<br>MPEG TS (ETI SC/PC, MC/PC)<br>single and multiple GSE                                                            | single and multiple MPEG-TS<br>MPEG TS (EDI MPE)<br>MPEG TS (ETI SC/PC, MC/PC)<br>GSE-HEM (S2X only) – on request                                                                                                                                                                                                                                      |



|                     | Basic DVB-S/S2 Single Tuner (default) | Dual DVB-S/S2/S2X Tuner (optional) |
|---------------------|---------------------------------------|------------------------------------|
| 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

### Streaming

|                         |                                              |
|-------------------------|----------------------------------------------|
| IP protocols            | UDP<br>unicast, multiple unicast & multicast |
| Transmission robustness | SRT<br>FEC<br>Dual Streaming                 |

### Synchronization

|          |                               |
|----------|-------------------------------|
| Internal | free-running                  |
| External | PTP, PTPv2, NTP, 1PPS, 10 MHz |

## Interfaces

### EDI/ETI

|         |                          |
|---------|--------------------------|
| ETI in  | 4x BNC socket E1/ETI in  |
| ETI out | 4x BNC socket E1/ETI out |

### Interface Extensions

|            |                                                                                                                |
|------------|----------------------------------------------------------------------------------------------------------------|
| ASI input  | 75 $\Omega$ BNC socket, 270 Mbit/s, MPEG2 TS<br>Note: Configurable to be either ASI input or 1 PPS SYNC input. |
| ASI output | 75 $\Omega$ BNC socket                                                                                         |

### Ethernet

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



## Synchronization

|                          |                                         |
|--------------------------|-----------------------------------------|
| 1PPS input               | 75 $\Omega$ BNC socket                  |
| GPS (optional)           | 75 $\Omega$ BNC socket                  |
| 10 MHz output (optional) | 50 $\Omega$ SMA socket, from GPS module |
| 1PPS output (optional)   | 75 $\Omega$ BNC socket, from GPS module |

## 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 $\Omega$ |
| 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<br>voltage range 90 – 260 VAC (nominal 100 – 240 VAC)<br>frequency range 47 – 63 Hz (nominal 50 – 60 Hz)                                                                            |
| Dual internal (optional) | 2x internal redundant power supplies (AC or DC) automatic switchover and prioritization<br>AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz)<br>DC: -40 – -60 VDC (nominal -48 VDC)         |
| Dual hot-plug (optional) | 2x hot-swappable redundant power supplies (AC or DC)<br>automatic switchover and prioritization<br>AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz)<br>DC: -40 – -60 VDC (nominal -48 VDC) |

# Options



## DAB-4s 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                                                                                                                                                                                      |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VER64101    | Base unit DAB-4s with 1x internal AC power supply                                                                                                                                         |
| VER64102    | Base unit DAB-4s with 2x internal AC power supplies                                                                                                                                       |
| VER64103    | Base unit DAB-4s with slot for 2x hot-plug power supplies<br>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                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VER64113    | Dual satellite tuner (*) | DVB-S/S2/S2X Dual tuner module <ul style="list-style-type: none"><li>QPSK, 8PSK, 16APSK, 32APSK</li><li>Supported symbol rates: 1 MSym/s – 45 MSym/s</li></ul> (*) Replaces default tuner.                                                                                                                                                                                   |
| VER64031    | DAB dual tuner (*)       | Up to 2 DAB mutli-band tuner for monitoring and control. <ul style="list-style-type: none"><li>Dual tuner with 75 <math>\Omega</math> F-type connector input.</li><li>Monitors information about ensemble, active services, sub channels and CU usage.</li><li>Alarm messages via SNMP or relay.</li><li>Only for monitoring purposes, audio output not supported.</li></ul> |
| VER64032    | ASI output               | ASI output for DAB multiplex (MPEG2-TS).                                                                                                                                                                                                                                                                                                                                     |
| VER65120    | Internal SSD storage     | 128 GB internal SSD storage                                                                                                                                                                                                                                                                                                                                                  |

# Options



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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)

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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                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VER64022    | Additional backup (*)      | Define a backup source for automatic backup switching in case of main source failures.<br>(*) On request.                                                                                                                                                                                                                                                                                  |
| VER64023    | EDI to ETI/EDI conversion  | Converts an EDI input (ETSI TS 102 693) to an ETI output (ETI-NI, ETI-NA 5592, ETI-NA 5376) or an EDI output (ETSI TS 102 693).<br>Up to 4 converters may be activated (1st converter VER64023 or VER64024 included in base unit).                                                                                                                                                         |
| VER64024    | ETI to EDI conversion      | Converts an ETI input (ETI-NI, ETI-NA 5592, ETI-NA 5376) to an EDI output (ETSI TS 102 693).<br>Up to 4 converters may be activated (1st converter VER64023 or VER64024 included in base unit).                                                                                                                                                                                            |
| VER64020    | EDI PFT seamless switching | <ul style="list-style-type: none"> <li>Decoding and seamless switching between two EDI PFT input streams.</li> <li>Alarming in case of EDI PFT sync loss.</li> </ul> Price per unit.                                                                                                                                                                                                       |
| VER64021    | ETI hardware mirroring     | <ul style="list-style-type: none"> <li>Define the 4 ETI inputs as additional outputs.</li> <li>Define loops to copy the input signals to defined outputs of the device.</li> </ul> Price per unit.                                                                                                                                                                                         |
| VER64025    | ETI switch (*)             | Automatic and seamless switching between two ETI input streams to one ETI output stream. In combination with option ETI to EDI a parallel conversion to EDI is possible.<br>(*) On request.                                                                                                                                                                                                |
| VER64110    | EDI IP input               | Receives and decodes an EDI input via ethernet for redundancy purposes, for example main or backup. <ul style="list-style-type: none"> <li>An ETI or EDI output is possible.</li> <li>In combination with additional backup, an automatic switch between two input sources is possible.</li> </ul> Requires option EDI to ETI/EDI conversion (VER64023).<br>Price per activated converter. |



| Article no. | Name                    | Description                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VER64039    | SRT                     | <p>Robust streaming of EDI over unstable networks</p> <ul style="list-style-type: none"> <li>• SRT encoding for EDI outputs</li> <li>• SRT decoding for EDI inputs (requires activated EDI to ETI/EDI conversion)</li> <li>• In combination with additional backup, an automatic switch between two input sources is possible.</li> </ul> <p>Price per activated converter.</p> |
| VER64033    | MPEG-TS encoder         | <p>Conversion of ETI/EDI input signals to MPEG-2 TS.</p> <p>Price per activated converter.</p>                                                                                                                                                                                                                                                                                  |
| VER64034    | TS MPE IP forwarding    | <p>IP forwarding transport stream with MPE.</p> <p>Price per activated converter.</p>                                                                                                                                                                                                                                                                                           |
| VER64026    | PTP synchronization     | <p>Synchronized protocol for networked measurement and control systems. According to IEEE 1588-2008 - IEEE standard for a precision clock.</p> <p>Price per activated converter.</p>                                                                                                                                                                                            |
| VER64027    | Advanced GSE processing | <ul style="list-style-type: none"> <li>• GSE decapsulation</li> <li>• GSE IP forwarding</li> </ul> <p>Price per activated converter.</p>                                                                                                                                                                                                                                        |