DSR01/DSR02
DVB Satellite Receiver

Professional Audio Satellite-Receiver

User Manual DSR01/DSR02

User Manual DSR01/DSR02 V2.27

October 2019

Content

Symbols in this manual

1.1 Tags and their meaning

The following signal words are used in the product documentation in order to warn the reader about risks and dangers. The tags described here are always used only in connection with the related product documentation and the related product.

DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
NOTICE	Describes precautions necessary to protect the equipment.
	**NOTE:** Useful information for the user.

1.2 Warning signs and their meaning

The following warning signals are used in this user manual:

	Warning of general danger location
	Warning of electric shock
	Warning of hot surface
	Warning of fire hazard

1. Introduction

The DSR01/DSR02 is a professional satellite receiver for the reception of a MPEG2 transport stream via DVB-S/DVB-S2/DVB-ASI and decoding of included audio signals and auxiliary data. It receives the IF (L-band) output of a satellite receiving LNB with a frequency range of 950…2150 MHz. The received audio streams and data streams can be output on several different digital and analog interfaces.

The DSR01/DSR02 is available in different variants with varying functions. The basic functionality is shown in the following table:

	Feature List / Model	DSR01 Easy	DSR01 Basic	DSR02
Standard				
	DVB-S tuner module (1-45 MSym/s)			
	Headphone output	✓	✓	✓
	2 x serial output for RDS	✓	✓	✓
	XLR AES/EBU audio interface group (Analog L, Analog R and Digital)		✓	✓
	15 kHz low pass filter		✓	✓
	Adjustable audio delay		✓	✓
	10/100Base-T interface (control/monitoring)	✓	✓	✓
	1000Base-T interface (data)			✓
	Display and jog dial		✓	✓
	Web interface (10/100Base-T interface)	✓	✓	✓
	SNMPv2c	✓	✓	✓
	RDS/UECP decoder in web interface		✓	✓
	DVB-ASI (in- and output)			✓
	Transport stream output over 1000Base-T interface			✓

Optional functionality is also available:

	Feature List / Model	DSR01 Easy	DSR01 Basic	DSR02
Options	**Transport stream input**			
	Tuner module with DVB-S2 and low symbol rates (min 64kSym/s)		✓	✓
	Tuner module with DVB-S2, 16APSK & 32APSK and advanced functionality (VCM/ACM, multi stream, …)		✓	✓
	Transport stream input over 1000Base-T interface			✓
	Audio input			
	IP audio input on 10/100Base-T interface using an Icecast[1] Server (backup audio)		✓	✓
	UDP or UDP/RTP audio streaming input on 1000Base-T interface as alternate audio channel source			✓
	Audio output			
	2x X.21 interface (optional on request)		✓ 1)	✓ 1)
	second XLR AES/EBU audio interface group (Analog L, Analog R and Digital)		✓	✓
	Data output			
	2 additional RS232 outputs		✓ 1)	✓ 1)
	Low speed IP data output (i.e. RDS, DRM)		✓	✓
	High speed IP data output (MPE IP data)			✓

[1] or „SHOUTcast"; in the following only „Icecast" will be used for a better readability

	Monitoring			
	IP audio streaming server for monitoring		✓	✓
	Remote Control			
	Control via satellite carrier (i.e. relay switching, firmware update, etc.)		✓	✓
	Decoding			
	Audio decoding: MP2/4/AAC-LC/ AAC+ HE v1 & v2		✓	✓
	Hardware			
	DVB Common Interface (DVB-CI)			✓[2)]
	SD Card for audio file storage (backup audio)		✓	✓
	Additional relay outputs		✓	✓
	Demultiplexing			
	MPE demux: IP data output of demultiplexed MPE data (IP datagrams) over 1000BASE-T interface			✓

1) DSR02: device can either be equipped with 2x X.21 or 2x RS232 outputs

2) DSR02: on request

Important notice

NOTE: Read this user manual carefully before attempting to operate the FlexSource.

Save this user manual for future reference – it contains important safety and operating instructions for the device.

Further notices

NOTE: The graphics of the manual may differ from the supplied model or the actual appearance.

Configurations, functions and specifications can be changed without prior notice.

This manual does not cover basics about the transmission of audio and auxiliary data via DVB-S/DVB-S2/DVB-ASI, nor does it cover basics about the usage of web browsers or IP networks. Thus, relating basic knowledge is required.

This manual covers all DSR01/DSR02 device variants combined. Some functions described may not be applicable to the device ordered.

If you require further assistance please contact our support team.

2. Safety Instructions

For a secure operation of DSR01/02 the user should read and hold on all safety instructions mentioned in this manual before the first operation.

⚠WARNING	Non-compliance with the safety instructions can lead to serious injury.

Any changes on DSR01/02 or operation of the parts not having been proved and released by the manufacturer can lead to unforeseen damage.

Every improper use of DSR01/02 and all actions on the device not mentioned in this user manual are regarded as a not allowed misuse outside the statutory limits for liability of the manufacturer.

If you sell DSR01/02 or give it to another person, attach this user manual to the device.

Never operate DSR01/02, if it does not function properly. If the device or its part is out of order, put it out of operation. Never repair the device by yourself. If there are any damages in the device, sent it immediately to 2wcom Systems for maintenance or dispose it professionally according to the regional disposal regulations.

Keep the device away from unauthorized persons.

⚠ DANGER	
	**DANGER of electrical shock** Plug the device into a grounded power socket only. Never remove the grounding wire/contact. Never open the housing of the device by yourself. Never touch open electrical parts. Dangerously high voltages are present inside the housing. Even after disconnecting the mains supply, dangerously high voltage levels may be present for a certain time. Do not touch the device with wet hands. Never expose the device to liquids. If any liquid comes inside the housing, immediately disconnect the device completely from the power supply. Do not continue operating the device.

FIRE HAZARD of overheating or electric shock

Ensure sufficient heat dissipation during operation. Avoid following when installing the device:

- non-ventilated environment, for example a narrow shelve or built-in wardrobe;
- extremely warm or cold place;
- direct sunlight exposure;
- too high or too low temperature;
- extremely wet or dusty environment.

Do not operate the device in the presence of flammable gases.

Do not cover the ventilation openings of the device to avoid heat accumulation.

Do not put objects with open flames such as burning candles on the device.

Do not put heavy objects on the supply cord. A damaged cord can lead to fire or electric shock hazards.

To disconnect the supply cord, drag always the plug and never the cable to avoid the cord damage.

⚠WARNING

WARNING of explosive atmosphere

DSR01/02 may **not** be used in an explosive environment; otherwise there is a risk of the explosion hazard.

WARNING of hot surface

The surface of the device can heat up during operation. DSR01/02 is equipped with a passive cooling system. However, it does not switch off automatically, if it is overheated.

Do not touch the surface of the device during operation.

NOTICE

CAUTION: Risk of equipment damage

Before the first operation:

Check the housing, the front panel, the supply cord and the plug for visible damage (e.g. scratches, cracks, damaged isolation and abrasion)

In case of damage, unplug immediately the supply cord. Never operate device with a damaged supply cord.

All damaged components must be replaced immediately.

Installation:

Use only a grounded three-wire power supply cord and -plug that complies with the national regulations.

If necessary, another than the supplied supply cord has to be used, in

	compliance with the regulations of the country where the device is operated. Make sure that the AC power outlet is next to the device and readily accessible to the user. *Installation of other devices:* External devices which are connected to the device could be damaged by the device or damage the device itself, if the output levels exceed the specified limits. *Cleaning:* Do not use corrosive detergents on the device such as benzine, thinner, alcohol or acetone. Clean the surface of the device only with a soft dry cloth.

3. Supplied Parts

- DSR01 Easy, DSR01 Basic, or DSR02
- Power supply cord
- Patch cable
- CD with supplementing data (SNMP MIB files, handbook as PDF)

NOTE: The scope of delivery may deviate in special cases.

4. Manufacturer

2wcom Systems GmbH • Am Sophienhof 8 • 24941 Flensburg • Germany
Phone (+49) 461 – 662830-0 • Fax (+49) 461 – 662830-11

contact@2wcom.com • www.2wcom.com

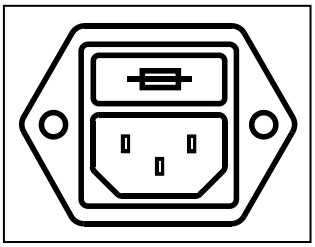
5. Installation

Best setup location

The device should be installed in a 19” rack. Avoid direct sunlight, close proximity to radiators and air conditioning, dust, water, and chemicals. Choose a rack location that permits a clear view to the indicators on the device and ensure a sufficient heat dissipation of the device.

Power supply

The device is designed for operation with 100 to 240 V AC, 50 Hz to 60 Hz. Check the corresponding device labeling for compatibility to the domestic line voltage and frequency before connecting the IEC power connector to the mains supply!



No power switch is available; unplug mains supply connector to power off the device. Keep the mains supply plug readily accessible to the user.

⚠WARNING	
	**WARNING** Disconnect mains power plug before you open the housing. Repair of the equipment must only be carried out by authorized and qualified personnel. Read also the precautions on page 9!

6. First steps

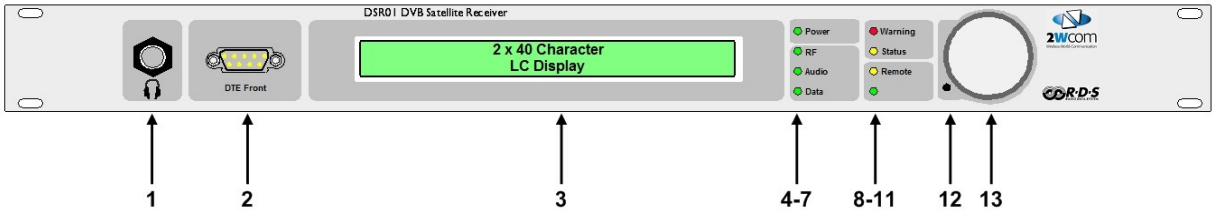
1.	Power supply	Please make sure that the device and the contained fuse(s) (please see p. 19) are compatible to the domestic line voltage and frequency. If the device is compatible, connect the power supply cord fully to the IEC power connector at the rear side of the device and a mains power outlet. The “Power” LED will then turn on.
2.	Network configuration	For delivery the device is configured with default settings for the first connection via the IP interface. If you have a device with LC-Display you can configure the IP settings right now: Select “Interface→IP” and configure the settings for your existing IP network (IP address, netmask, gateway etc.; consult the responsible network administrator if applicable). If you have a device without LC-Display, network settings can be changed only via the web interface (continue at step 3).
3.	Connect to network	Connect a network patch cable to the “10/100-Base-T” connector on the rear side of the device and your existing IP network.
4.	Web interface	The device can be fully operated with an internet browser via the integrated web interface. Use a computer that is connected to the same IP network that the DSR01/DSR02 device is connected to. Start an internet browser (e.g. Firefox/Mozilla >V2.0 or Microsoft Internet Explorer >V6.0 (both with Java Script activated)) and enter the configured IP address in the address bar of the browser. If the IP address has not been changed in step 2, please enter the default address in the address bar of the browser: 192.168.14.250. A login screen with *Username/Password* appears. You can use the default accounts: for a read-only access use “guest”/”guest” and for a full access use “admin”/”admin”. After entering the correct login data (case sensitive), the main DSR01/DSR02 page

		appears. Please change the login data as soon as possible to avoid unauthorized access to the device and document the login data in a safe place.
5.	Adjust volume levels	Use „Interface Settings“→“XLR” and „Headphone” to configure the audio volume for the XLR outputs and the headphone output.
6.	Connect satellite antenna cable	Now connect the antenna cable that has a connection to the receiving LNB of the satellite antenna to the “RF-In” F-type jack. A well aligned satellite antenna is required for signal reception.
7.	Tuning	Use the entry “TS Input Settings→Tuner” to configure the satellite transponder signal reception: Modulation type, L-band (LNB IF) tuner frequency (f = transponder frequency - LO frequency, LO e.g. 9.75GHz for lower band and 10.6GHz for upper band on universal LNBs), symbol rate, TS-ID (only if symbol rate <1 MSym/s), polarization, 22 kHz signal, Viterbi function (FEC). Example A (satellite antenna is aligned to Astra 19.2° east): Modulation: DVB-S QPSK, L-band frequency: 2032 MHz, Symbol rate: 22 MSym/s, Polarization: horizontal, 22 kHz: on, Viterbi: 5/6 or Auto. After a click on  , the virtual “RF”-LED in the upper right corner, as well as the real “RF”-LED (green color) of the device should turn on to indicate the reception of a signal.
8.	Configure output	Use the menu “TS Processing→Demux & Decode” to select manual or automatic configuration via SID (Service ID) of the PID settings that are necessary for decoding. If the selected mode is “SID (automatic)”, you can use the entries “1.SID” and “2.SID” to enter the corresponding SIDs. Note that “1.SID” corresponds to the first audio interface group (Analog/Digital 1), “2.SID” to the second one (Analog/Digital 2) If the selected mode is “PID (manual)”, use the “configure” buttons to configure the processing (audio decoding, data retrieval) of up to 8 PIDs out of the received transport stream.

		Example A, PID mode, configure the first three PIDs (only the listed functions are active): 1. Name: PCR1; PID Number:1035; Audio 1 Synchronisation: PCR1. 2. Name: AUDIO1; PID Number:1036; Output activated: Audio 1; , Delay: 10 ms. 3. Name: DATA1; PID Number:1037; DTE1: Data source - Private Data, Parameter: ES.
9.	Connect audio and/or data cables	You can now make the connections to the output interfaces on the rear side of the device to use the signals as configured at step 8 (Digital Audio: AES/EBU 1; Analog Audio: Analog L-1 and Analog R-1, Analog Audio: Headphone; Data: DTE1). With the outputs 1 and outputs 2 (Analog L/R + Digital) it is possible to output up to two individual audio signals (PIDs) of a single transponder signal simultaneously. Note that the second audio interface group is only available with hardware option second XLR AES/EBU audio interface group enabled.
10.	Use station presets	All previous mentioned settings are automatically stored in the active preset. To configure another station, first use "System Settings→Preset" to select the next unused preset memory. Use "Preset name" to define a name for the active preset.
11.	Ready!	These first steps are only intended for a quick first start and do not cover all device functions. Pease read carefully the entire manual to be able to use all functions of the device.

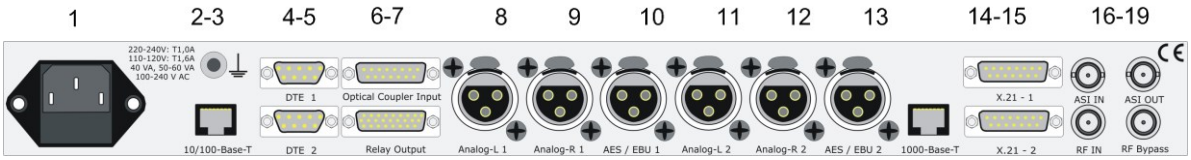
7. Control elements and connectors

7.1 Front Panel



1	Headphones	6.3 mm / 1/4" socket for the connection of headphones. The device can be configured to output the received audio data on this output.
2	[DTE Front]	9 pole D-Sub male connector; only for device servicing purposes.
3	LCD screen	Illuminated, Liquid Crystal Display (LCD) with two rows of up to 40 characters.
4	[Power] LED	Activated (green color) if the power supply is ok.
5	[RF] LED	Activated (green color) if the receiver detects a signal that can be decoded.
6	[Audio] LED	Activated (green color) if the receiver detects audio data that can be decoded.
7	[Data] LED	Activated (green color) if a data monitoring is activated for the DTE1 interface and data on this interface is detected.
8	[Warning] LED	Flashes (red color) if the monitoring function detected the triggering of a configured alarm.
9	[Status] LED	No function
10	[Remote] LED	No function
11	LED	LED to the right side of the DATA LED. Activated (green color) if a data monitoring is activated for the DTE2 interface and data on this interface is detected.
12	reset button	Recessed reset button for resetting the device in the case of malfunction. To activate the protected button, please use a metal pin or an unbent paper clip.
13	Jog dial	Jog dial for the device operation via the LCD screen on the device. Turn the jog dial to place the cursor on the desired menu entry and push the jog dial to activate the highlighted menu entry.

7.2 Rear Side



1	IEC power supply connector	Standardized IEC supply connector with integrated fuse holder. Fuse ratings depending on mains supply voltage: 100-120V: T1.6A, time lag type, 5x20 mm, 250 V 220-240V: T1A, time lag type, 5x20 mm, 250 V
2	[Grounding stud]	The stud can be used to connect a grounding system if necessary.

NOTE: The required protection earth (PE) is accomplished via the 3-wire mains supply cord.

3	[10/100-Base-T]	RJ-45 connector for control and monitoring the device via Ethernet. The device can communicate with the IP network and can be configured with an internet browser via the integrated web interface. The LED´s at the socket show the link status (green; active if a physical network connection exists) and the activity status (yellow, active if data communication is active).
4-5	[DTE 1/2]	9 pole D-Sub male connector for the serial RS-232 data communication, e.g. the output of application data of the received signal.
6	[Optical Coupler Input]	15 pole D-Sub female connector; no function
7	[Relay Output]	26 pole D-Sub male connector; Switch contacts of 12 integrated relays. The relays can be activated by the monitoring function in case of an alarm.
8-9	[Analog-L1/R1]	XLR male socket; Output of the left/right channel of the analog output number 1 with configurable signal level.
10	[AES/EBU 1]	XLR male socket; AES/EBU interface for the output of the digital audio signal number 1 in the "Professional Format". The sample rate of the signal depends on the received signal.
11-12	[Analog-L2/R2]	XLR male socket; Output of the left/right channel of the analog output number 2 with configurable signal level.
13	[AES/EBU 2]	XLR male socket; AES/EBU interface for the output of the digital audio signal number 2 in the "Professional Format". The sample rate of the signal depends on the received signal.
14	[X.21-1]	(optional on request) 15 pole D-Sub male connector for the output of an MPEG data stream.
15	[X.21-2]	(optional on request) 15 pole D-Sub male connector; no function
16	[ASI-In]	BNC connector; For the input of a DVB-ASI data stream (270 MHz) to be decoded by the device. (DSR02 only)

17	[RF-In]	F-type jack; Input for the connection to the receiving LNB of the satellite antenna (IF: 950 MHz…2150 MHz, L-band).
18	[ASI-Out]	BNC connector; For the output of a DVB-ASI data stream (270 MHz) received via DVB-S/DVB-S2 tuner, ASI input or 1000Base-T. (DSR02 only)
19	[RF-Bypass]	F-type socket; no function
20	[1000-Base-T]	RJ-45 connector for Gigabit Ethernet data communication. This interface is used to transceive MPEG2 transport streams as well as decoded MPE IP data. The LED´s at the socket show the link status (green; active if a physical network connection exists) and the activity status (green, blinks if data communication is active).

8. Operation

8.1 Device Control via Web Interface

Connection	The device has an integrated web interface. All configurations and operations can be made using a web browser. To do this, it is necessary to connect the Ethernet connector (10/100-Base-T) of the device and the computer with installed internet browser to your existing IP network. See also page 15, steps 2. to 4.
Browser	To work with the web interface please use the web browser Firefox/Mozilla >V2.0 or MS Internet Explorer >V6.0. In order to be able to correctly use the web interface it is required that java-script is enabled within the browser.
IP address	To open the web interface enter the IP address of the device in the address bar of the browser. Upon delivery the default IP address is 192.168.14.250 and the network mask is on 255.255.255.0.
Access	To prevent unauthorized access to the device, it is protected by *username / password*. Upon delivery the read-only account is predefined to username: 'guest' and password: 'guest' (without the apostrophes). For full-access it is 'admin'/'admin'. After the correct log-in (case sensitive) you can see the main page of the DSR01/DSR02 web interface. Please change the access accounts to individual username/password settings to prevent unauthorized access and document these data in a safe place. This can be done under "System Settings→User". To maintain security, you are automatically logged-out after 15 minutes of no activity.
Navigation	Only use the navigation buttons of the web interface, not those of the web browser (i.e. forward and back).
Buttons	During the configuration, you can save the changes in the device by pressing the button save or reset unsaved changes by pressing the button reset in the input fields of the web interface. Saved changes cannot be reset by this button to a default.

Please note that each field has to be saved individually.

If you change data in several fields, you must click save under each field, in order to save all changed data. Otherwise, the unsaved field will be reset to the previously saved status.

Numbers — Use a decimal point as the decimal separator in numbers in the input fields (i.e. “6.5” for six and a half).

Input fields — After entering a number or text in an input field, you must click on the corresponding save or ok button for the changes to take effect. Alternatively you can use the ENTER-key of your computer keyboard.

The next pages explain the individual web interface functions. The operation via jog dial and LCD on the device is similar to these descriptions.

8.2 Operation via LCD / jog dial

Most functions of the device can also be operated via the LCD/jog dial at the device. The operation works analogously to the web interface descriptions. If a function of the web interface is applicable for the LCD/ jog dial, the corresponding menu path is shown at the web interface description.

By pushing the jog dial you can change the screen from the default status screen to the main menu screen. By turning the jog dial it is possible to move the cursor “→” in the menu structure. To open a menu entry or to confirm a setting push the jog dial. If a configurable menu entry is selected, it is displayed in brackets “> <” and you can adjust it by turning the jog dial. Confirm the adjustment by pushing the jog dial. To return to a previous menu level, activate the menu entry “Back”.

You can change the operating language of the LCD-menu by choosing “Settings→Language” (or in German Language: “Einstellung→Sprache”) in the main menu. The available languages are English and German.

9. Audio and data processing flow

The following pages will describe audio and data processing flows for the DSR01 and DSR02 devices. The DSR01s data flow is straight forward, as there is only one input (the DVB-S/S2 tuner) and central audio and data processing. The DSR02 on the other hand has far more input and outputs, so that understanding data flow in the DSR02 is the key for successful operation.

9.1 Audio processing

Basically audio processing is the same in both devices. Each device has two audio channels that each feed into dedicated analog and digital audio outputs or stream the raw audio data via IP network. Each channel can be fed from different primary and secondary (fallback) inputs.

9.1.1 Primary inputs

For the DSR01 there is only one input, the DVB-S/S2 tuner (see Figure 1).

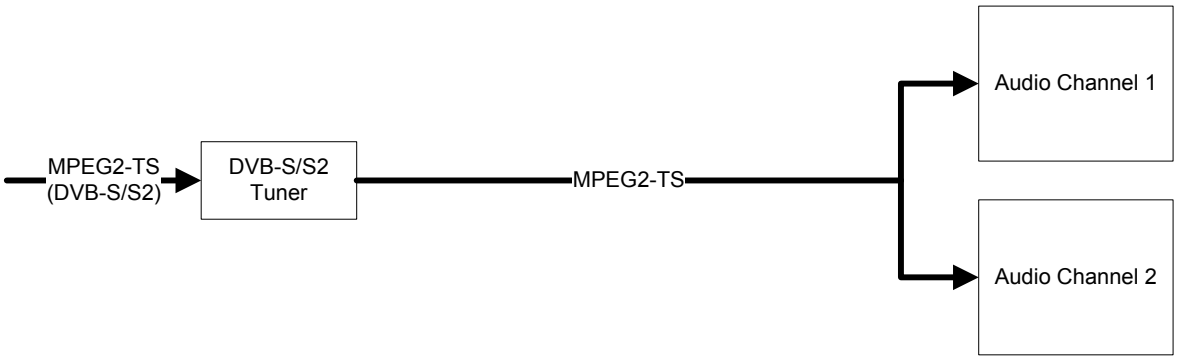


Figure 1: Data processing flow via the primary input DVB-S/S2 Tuner in DSR01.

The DSR02 however is equipped with a lot more primary inputs. In addition to the DVB-S/S2 tuner, the DSR02 comes with DVB-ASI input and 1000Base-T Ethernet. All three can be used as a primary input for MPEG2-TS. Audio channels share the same MPEG2 TS input however, thus audio channel 2 has to use the same MPEG2-TS source as does channel 1. Alternatively the 1000Base-T Ethernet interface can be set up to receive audio data directly via UDP or UDP/RTP instead of decoding MPEG2-TS for that channel. It is also possible for one channel to be fed directly, while the other processes MPEG2-TS (see Figure 2). Both channels can receive audio data from the 1000Base-T input at the same time.

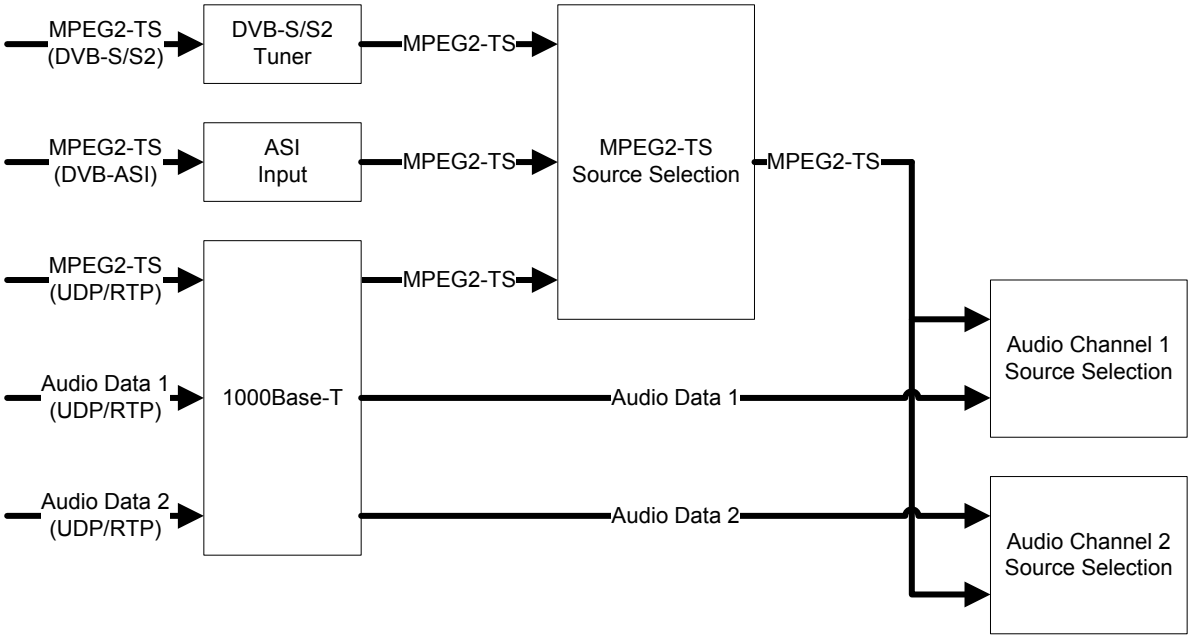


Figure 2: MPEG2-TS and Audio Data processing via three primary inputs: DVB-S/S2, DVB-ASI and 1000Base-T Ethernet in the DSR02.

9.1.2 Secondary inputs

There are scenarios where the need arises to fall back to an alternate input, for example bad or no satellite reception due to weather conditions. In this case, the DSR0x can be configured to use a fallback audio source, or secondary input. Secondary inputs are either audio files stored on an internal SD card or audio streams from an Icecast server in the local network or the internet (see Figure 3). The DSR0x's alarm system can be used to configure the device for cases when secondary inputs should be used and when the receiver should return to normal operation.

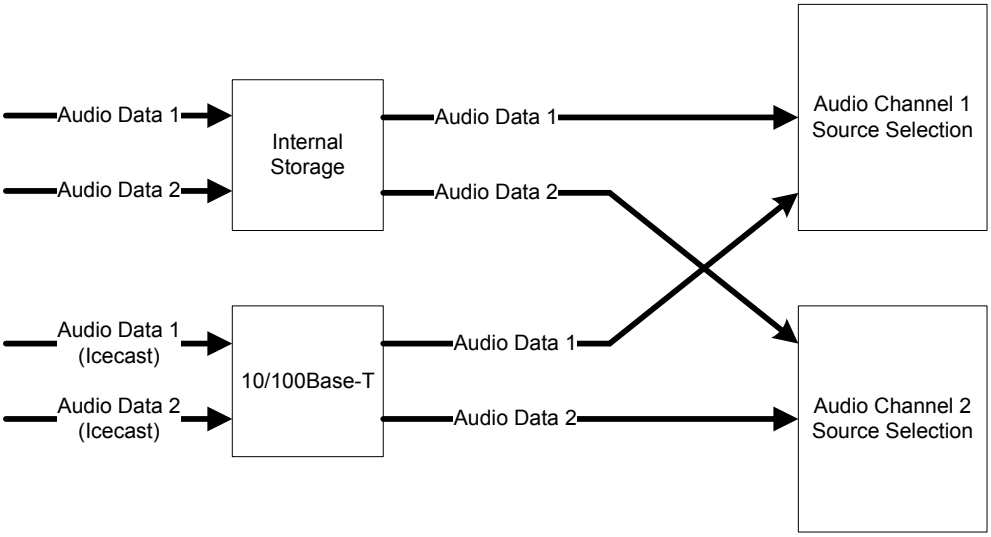


Figure 3: Processing of the fallback data via the secondary inputs in the DSR0x.

9.1.3 Audio outputs

Once primary and secondary inputs for each audio channel have been configured, outputs for each channel need to be set up. Each audio channel is connected to a dedicated set of outputs: three XLR connectors for analog (left and right) and digital audio, and a X21 connector also for digital audio. Also raw audio data can be streamed via the 10/100Base-T interface using the Icecast protocol (see Figure 4). Headphones can only be used by one audio channel at a time. If both channels are configured to use headphones, channel 1 takes precedence.

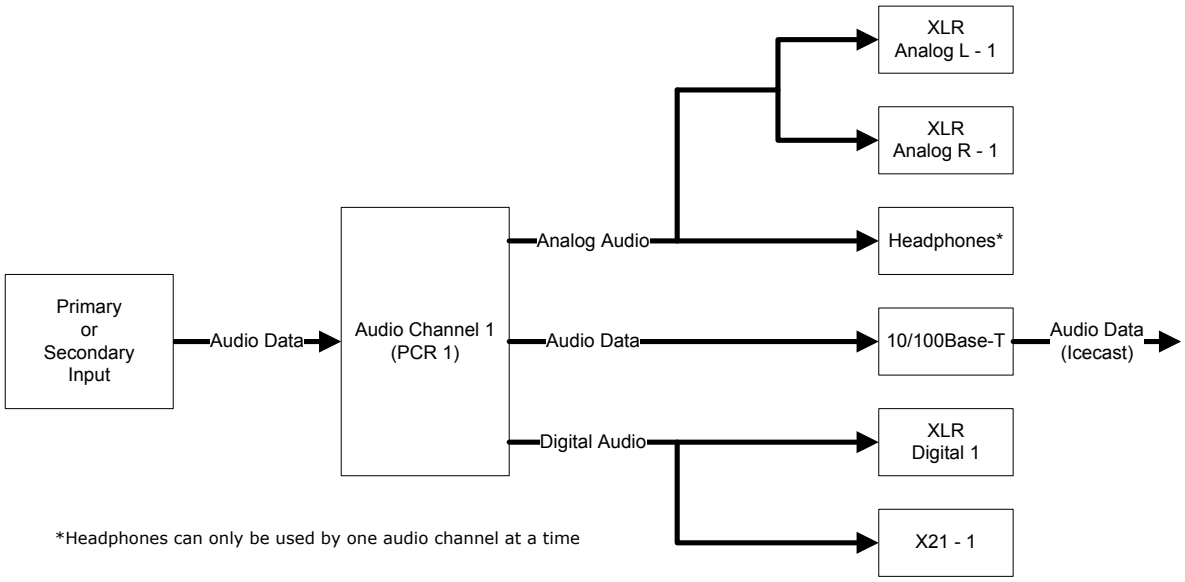


Figure 4: Possible outputs for audio data in one audio channel in the DSR0x.

Note that this figure only shows audio channel 1. Audio channel 2 is set up in exactly the same way, except it uses PCR2 and connectors XLR Analog L/R - 2, Digital - 2 and X21 – 2 instead.

9.2 Data processing

Data processing works similar to the way audio processing does, except there are no secondary inputs and it employs different outputs. Data processing in DSR01s is limited to MPEG2-TS from the DVB-S/S2 tuner, in the DSR02 data can be extracted from all primary MPEG2-TS inputs. As is the case with audio processing, all data processing shares the same source.

There are two typical scenarios for data processing: a) control or other data being transported in private or ancillary data sections in the MPEG2 TS, i.e. RDS data for radio transmission or satellite in-band control data to control, among other things, relays or b) IP data encapsulated in multiprotocol sections (MPE).

The DSR01 is only equipped to handle scenario a) (see Figure 5).

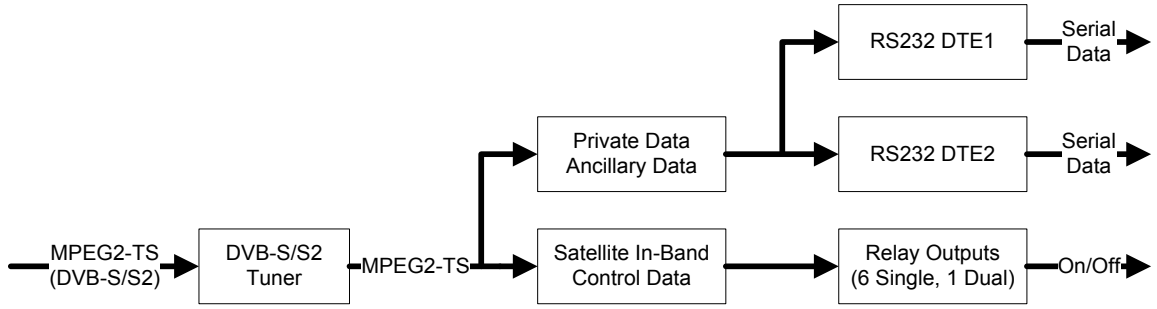


Figure 5: Data processing in the DSR01.

The DSR02 is able to handle both scenarios and, in addition to the DSR01, to extract, filter and forward IP data from MPE sections in the MPEG2 TS to the 1000Base-T interface (see Figure 6).

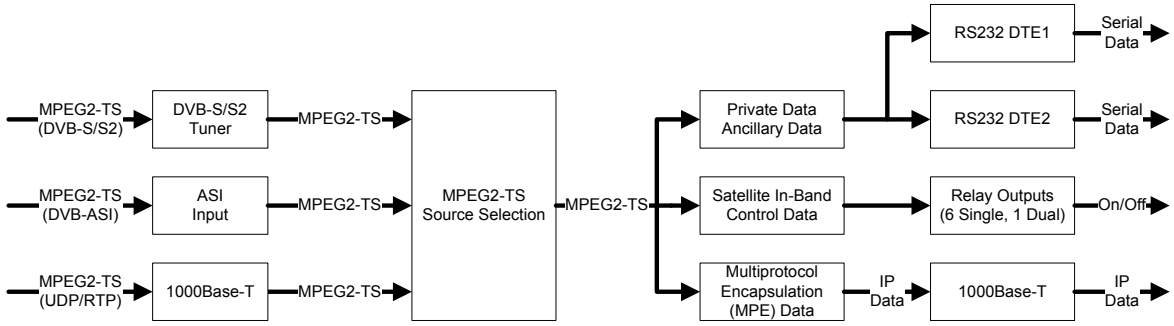


Figure 6: Data processing in the DSR02.

9.3 Data distribution

In the DSR02 it is possible to forward MPEG2-TS data from inputs to outputs. This can be used for instance to convert a transport stream from DVB-ASI to DVB over IP (transport media conversion) or to reshape a DVB-ASI signal (repeater). Each output is independent of the other, so that for instance while the 1000Base-T input delivers the MPEG2-TS for audio and data processing, the DVB-ASI input acts as source for the 1000Base-T output, while the DVB-S/S2 tuner delivers a transport stream to an external device using the DVB-ASI output (see Figure 7).

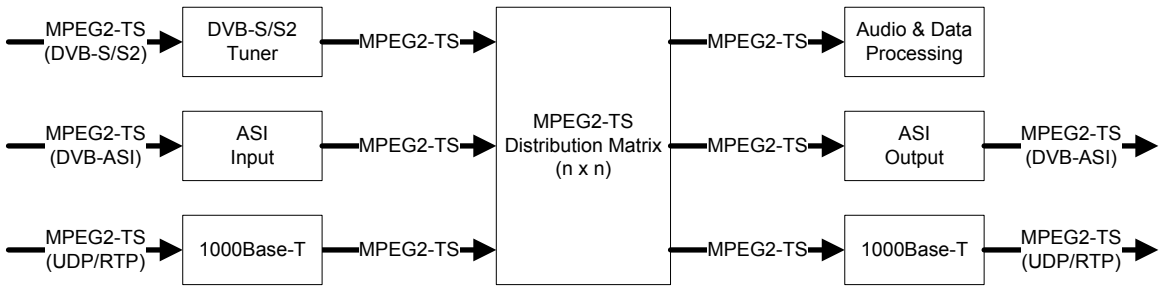


Figure 7: Data distribution from inputs to outputs in the DSR02.

10. Description of the web interface

The following pages will describe all of the menu items of the web interface. Depending on the device configuration ordered, certain menu items might not be visible to the user. Menu items that depend on hardware or software options have references to the option. A complete list of available options can be found in chapter 0.

10.1 System: system information page

This menu item is available under "Information→System" and lists in short information about the DSR01/DSR02, including:

Device identification:	Device name, location and description. These parameters can be changed under "System Settings→Global".
Reception information:	In case of the reception of a valid DVB-S/S2 signal, network ID (NID), tuner state (State) and signal bit error rate (BER) are shown here. The bar graphs underneath this block represent the channel to noise ratio (C/N (dB)) and level of the received signal.
Device run time:	This block gives information about the device run time and date of last system startup.

LCD-menu: main menu (reception information as stated above only)

10.2 Audio Input Settings

Prerequisite: IP audio input combined with built in industrial grade memory card (back-up audio)

The redundant audio source option offers a backup solution in which the original audio source (satellite audio) is replaced by an IP Icecast audio stream or an audio file located on an internal SD memory card. There can be multiple scenarios, where it might be necessary to switch to an alternate source, i.e. when signal quality is not good enough, the satellite signal is lost or any other reason, that would require an alternate audio source to be used instead of the original source. The point at which the alternate audio source is used is configured by alarm settings (see "System Settings → Alarm"). If for example the C/N ratio drops below 10dB in a bad weather condition, the C/N alarm can be set to switch the audio source to the redundant audio source. Once the weather situation clears up, the original source will be used again.

10.2.1 Audio over IP (UDP): Raw Audio Stream Input

This menu item is available under " "Audio Input Settings→Audio over IP (UDP)" and is used to configure the 1000Base-T Ethernet input parameters for two Raw Audio over IP streams. An enabled raw audio stream replaces audio decoding for the corresponding decoding channel, i.e. raw audio from audio channel 1 will be decoded and put out using PCR1 to Analog Audio 1 L/R, AES/EBU 1 and Headphones outputs. Audio decoding of PIDs by using resources that belong to an audio channel will be suspended when raw audio input is enabled. It is however possible to use audio channel 1 with raw audio data input and audio channel 2 with the source selected in "TS Processing → Demux & Decode" and vice versa.

Activation:	Activate or deactivate raw audio input for corresponding audio channel.
Data source:	Use this option to declare the transmission method of the incoming transport stream, Unicast (point to point) or Multicast (point to multipoint).
Port:	UDP Port number that incoming raw audio streams need to be sent to for further processing.
Protocol:	Protocol type used to encapsulate incoming transport stream. Needs to be set manually for correct decoding.
Decoder:	Choose the audio decoder to be used in case there is more than one option.
Delay:	Time in milliseconds before audio is put out.

10.2.2 Audio over IP (Icecast) client as backup: Streaming Server

Prerequisite for second client: second audio interface group

The menu item is available under "Audio Input Settings→Audio over IP (Icecast)". Here you can define up to two Icecast compatible audio streaming servers, which can be used as a back-up source for the primary input.

Name:	Assign a name to the Icecast server for better reference, i.e. "Backup 1".
IP or URL:	Icecast server IP address or URL, i.e. "247.56.38.14" or "www.backup-audio.com"
Port:	Icecast server port, i.e. "8080".

Ignore First Streaming data:	Ignore the first 0 to 20 seconds of audio data. Can be used to ignore burst audio data transfers that usually start each new audio data transmission from Icecast servers, after a few seconds, the incoming data is more streamlined, resulting in better and especially more synchronized audio playback when using multiple DSRs.
Delay:	Delay time from 10 to 2000ms before playback is started. Note that the delay timer is started after the "ignore first streaming data timer" has expired.

NOTE: It is necessary to configure a gateway under "Network Settings→TCP/IP" in order for the clients to reach the servers.

Clients use the 10/100-Base-T Ethernet interface (control and monitoring). If an URL is chosen instead of an IP address at least one DNS server needs to be configured ("Network Settings→TCP/IP").

10.2.3 Internal Storage: internal SD card configuration

The menu item is available under "Audio Input Settings→Internal Storage".

The internal SD card can be used to store audio files to be played back in case the primary data input (DVB-S/S2 tuner, 1000Base-T, ASI, Audio Streaming Input) fails. Audio files can be uploaded to the SD card using a FTP client connecting to the 10/100Base-T interface (same as web interface) using the login data of the web interface. Alternatively, the 2wcom Satellite In-Band Control System can be used to download files via satellite onto the SD card. For further information on 2wcom's Satellite In-Band Control System contact us.

On the SD card there are 10 directories named "SLOT_0" to "SLOT_9" corresponding with Audio Slot 1 (SLOT_0) till Audio Slot 10 (SLOT_9) in the SD card menu in the web interface. It is possible to store multiple files in each SLOT directory, however only one file can be active for that slot at a time and multiple files do not act as a playlist.

Follow these steps, in order to configure a file for an audio slot:

1. Click the configure button of the corresponding slot.
2. Assign a name to each used slot, that can be used in the alarm settings for future reference.

3. Save the Slot name by clicking save.
4. Select the audio file for that slot from the drop down list.
5. Click "set" to save the new configuration.

NOTE: Upload a file to the SD card directory that corresponds to the audio slot in question, in order to make a file visible in the drop down list.

When an audio slot has been set up, it can be configured as a fall back option in the alarm settings under "System Settings→Alarm".

10.3 TS Input Settings

10.3.1 SAT Tuner: tuner setup

This menu item is available under "TS Input Settings→ SAT Tuner" and is used to configure all necessary parameters for satellite signal reception.

Tuner A/B:	Choose between Tuner A and Tuner B on twin tuner boards. (This menu item is only available when device is equipped with a 16APSK tuner board)
Activation:	Activate or deactivate tuner.
Modulation:	Modulation type of the signal to be received.
Frequency L-Band:	Frequency of the signal after it leaves the low noise block converter (LNB) ranging from 950-2150MHz. For standard universal LNBs the frequency is typically 9750MHz lower than the sending frequency for lower band transponders (10700-11750MHz) and 10600MHz lower for upper band transponders (11800-12750MHz), i.e. if the sending frequency of a transponder is 12600, then the frequency L-Band value is 2000MHz, assuming that a universal LNB is used.
Symbol rate:	Symbol rate used by the transponder in mega symbols per second (MSym/s).
TS ID:	Transport Stream ID that can be entered for low symbol rate transponders with symbol rates below 1MSym/s
Roll-Off:	Roll-Off factor used by the receiver filter.
Polarization:	Polarization used by the transponder, either horizontal or vertical.

Frequency Range: 22kHz signal used to tell the LNB via Digital Satellite Equipment Control (DiSEqC) to pass on lower band (22kHz off) or upper band (22kHz on) signals.

Viterbi (FEC): Viterbi code puncture rate used by the transponder, if unknown the option "Auto" can be used, resulting in slightly increased tuning times.

PLS: Physical layer scrambling code in case transmission is scrambled using PLS, for unscrambled transmissions use 0. (This menu item is only available when device is equipped with a 16APSK tuner board)

If the correct transponder data was entered, after clicking on save the RF-LED in the upper right corner and the RF-LED on the front plate, should be lit up. Note that in case of low symbol rate signals, this can take up to a few seconds to happen.

Incoming signals from the LNB are subject to frequency tolerances, thus check the "CFO Error" under menu item "Status→Tuner". This value represents the margin by which the entered frequency deviates from the actual frequency. In order to maximize reception quality the CFO error should be minimized.

LCD-menu: Input→Tuner Settings

LCD-menu: Status→Tuner→Signal

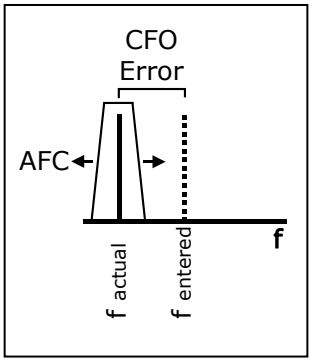


Figure 8: Determination of the frequency tolerance "CFO Error".

10.3.2 ASI: configuration of DVB-ASI input

Prerequisite: DSR02

This menu item is available under "TS Input Settings→ASI" and is used to configure the DVB-ASI input.

Activation: This option enables or disables the DVB-ASI input.

Changes are applied by clicking the save button.

10.3.3 IP 1000Base-T: configuration of 1000Base-T Ethernet input

Prerequisite: DSR02 and Transport stream input over 1000Base-T

Transport Stream Input

This menu item is available under "TS Input Settings→IP 1000Base-T" and is used to configure the 1000Base-T Ethernet input parameters for one UDP or UDP/RTP encapsulated Transport Stream over IP.

Activation:	This option enables or disables processing of an incoming transport stream via 1000Base-T Ethernet input.
Data source:	Use this option to declare the transmission method of the incoming transport stream, Unicast (point to point) or Multicast (point to multipoint)
Port:	Port number that incoming transport streams need to be sent to for further processing.
Protocol:	Protocol type used to encapsulate incoming transport stream. Needs to be set manually for correct decoding.

Note, that it is always possible to ping the interface, even if its activation is disabled.

Changes are applied by clicking the save button.

10.4 TS Output Settings

10.4.1 ASI: configuration of DVB-ASI output

Prerequisite: DSR02

This menu item is available under "TS Output Settings→ASI" and is used to configure the DVB-ASI output.

Activation:	This option enables or disables the DVB-ASI output. If disabled, the output will still transmit K28.5 comma characters used to synchronize sender and receiver.
Source:	Source of the MPEG2 transport stream to be transmitted over DVB-ASI.

Changes need to be applied and saved individually block by block, since only data associated with a save button (block) is stored.

10.4.2 IP 1000Base-T: configuration of Gigabit-Ethernet output

Prerequisite: DSR02

This menu item is available under "TS Output Settings→ IP 1000Base-T" and is used to configure the data source for the MPEG2 transport stream and the

targets IP address data. IP address parameters for the Gigabit-Ethernet output itself can be configured under "Network Settings→TCP/IP".

Activation:	This option enables or disables the Gigabit-Ethernet output. Note that this only applies to MPEG2 transport stream data, standard ARP- or ping-requests are still answered.
Source:	Source of the MPEG2 transport stream to be transmitted over Gigabit-Ethernet.
Destination address:	Destination IP address.
Destination port:	Destination UDP port. Usually 1234 for DVB streaming.
Source port:	Sender UDP port.
Protocol:	MPEG2 transport stream encapsulation, either UDP only or UDP/RTP. Note that with UDP/RTP, RTCP packets are generated also and send in 5 second intervals.

Changes need to be applied and saved individually block by block, since only data associated with a save button (block) is stored.

10.5 TS Processing

10.5.1 Demux & Decode: handling of transport stream data

Prerequisite for second SID: second audio interface group

This menu item is available under "TS Processing→Demux & Decode" and is used to make the necessary settings for distributing and processing of up to 8 PIDs.

Source:	Source of the MPEG2 transport stream to be processed.
Mode:	Mode of operation, either automatically by service ID (SID) or manually by configuring up to 8 individual PIDs. The modes are mutually exclusive.
SIDs:	In this block up to two SIDs can be configured for automatic processing. PIDs to be decoded are chosen automatically using the service ID number. Note that "1.SID" is associated with the first audio interface group (Analog L1/R1, AES/EBU1 and X21.1) and "2.SID" with the second group (with option, otherwise no function). Settings take effect only when SID mode is enabled (see mode above).

PIDs: In this block up to 8 individual PIDs can be manually configured for further processing rather than being chosen through a service ID. This allows for advanced and special decoding options. In order to configure PIDs manually, click the "configure" button. Settings take effect only when the PID mode is enabled (see mode above).

PID configure: PID configuration in PID mode

Some of following settings can be made using the LCD-menu: Output → Demux → PID-Config.

PID and MPE settings

Prerequisite for MPE: DSR02 and MPE

This block is used to define the PID to be decoded. In DSR02's with MPE option this block is also used to choose an IP audio stream encapsulated within a MPE PID to be decoded.

Name: Associate a PID with a name using this field.

Number: PID number to be processed.

Mode: Choose between packetized elementary stream (PES) for standard audio and data decoding or multi protocol encapsulation (MPE) decoding when the PID is containing multiprotocol encapsulated IP audio data.

IP: Destination IP address of MPE IP audio stream to be decoded.

Port: Destination Port of MPE IP audio stream to be decoded.

Audio

Prerequisite for Analog/Digital/Headphone 2 and PCR2: second audio interface group

In case the selected PID is an audio data carrying PID, outputs for the decoded audio can be configured in this block.

Output: Assign outputs to the decoded audio signal. Note that each output can only be assigned once and has to be reassigned by first unchecking the box in the currently assigned PID first, before being able to assign it to a new PID. Note also that you choose the correct outputs, if a PCR is used (see PID and PCR).

Decoder: Choose the audio decoder to be used in case there is more than one option.

Delay: Choose an audio delay that is applied to the output signal.

Audio 1-2 Synchronisation: Choose the type of synchronization for the audio data within the first and the second audio interface group. You can assign a PCR (Program Clock Reference) or a SFN (Single Frequency Network) to a PID or disable this option by choosing „off“.. Note that each PCR can only be assigned once and has to be reassigned by first unchecking the box in the currently assigned PID first, before being able to assign it to a new PID. There is no explicit need to assign a PCR, however in doing so the time before processing starts can be decreased and stability is increased. Note also that PCR 1 is associated only with the first audio interface group (Analog L1/R1, AES/EBU1 and X21.1), PCR 2 with the second group (provided hardware option was ordered).

Audio Output Stream

Prerequisite: IP audio streaming server for monitoring

This function can be used to stream up to eight 384kBit/s audio data streams (one per PID) over IP for monitoring purposes. Streams are based on the SHOUTcast or Icecast protocol and contain the original, unprocessed (audio) data contained in the PID. To receive streams clients like Winamp or VLC can be used, using the 10/100-Base-T's IP address and the port configured for this stream (see below). Note that it is possible to stream other data than audio, as long as the receiving application extracts the data from the Icecast stream. This however is not supported by the manufacturer. Note also that the 10/100-Base-T Ethernet interface is used for audio streaming, so the bandwidth might not suffice for data other than audio.

Output Format Enable audio streaming for current PID by choosing "Icecast" or disable it by choosing "None". The streaming protocol used by Icecast is TCP.

Port: Choose port for audio streaming server.

DTE1-4

Prerequisite for RDS over IP: IP data output

These two blocks can be used to configure DTEs 1 and 4 to output data extracted from the PID.

Data source:	Choose type of data to be output or "None" to disable data output. Note that DTEs can only be used once; in order to reassign a DTE it needs to be deactivated in the PID it is currently being used in.
Parameter:	Depending on the data source additional parameters can be set.
Enable Data over IP (e.g. RDS):	Enable or disable IP streaming of RDS UECP data extracted from data source over the 10/100-Base-T network interface. The stream is send using UDP. Note that when RDS over IP is enabled, RDS data is still put out on the DTE interface.
Destination IP:	Destination IP address of RDS data stream.
Destination Port:	Destination Port of RDS data stream.

In-Band Control Data

This block can be used to configure In-Band Control Data processing, in case the PID is carrying such data. 2wcom's Satellite In-Band Control System can be used to remotely control DSR0x's by inserting the control data into the transport stream. Remote control can be used for example to update settings, update firmwares, upload files or switch outputs and relays. For further information on the Satellite In-Band Control System please contact us.

Data Source:	Choose type of data to be processed or "None" to disable data processing for In-Band Control Data.
Parameter:	Depending on the data source additional parameters can be set.

X21.1

This block is used to configure the X21.1 output.

Output:	Enable or disable the X21.1 output.

10.5.2 MPE Demux: demultiplexing of MPE data

Prerequisite for MPE demultiplexing: DSR02 and MPE demux option

This menu item is available under "TS Processing→MPE Demux" and is used to make the necessary settings for distributing and processing of up to 16 PIDs containing MPE data.

Multiprotocol Encapsulation (short MPE), defined in EN 301 192, allows among other things, to transport IP datagrams using the MPEG transport stream (TS). IP datagrams are fitted into MPE sections, which in turn are fitted into TS-size

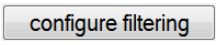
packets and later multiplexed into the stream. On the receiver side, MPE sections are reassembled and IP datagrams are restored for further processing, usually to be sent into a connected network. This for instance is used to provide asymmetric internet services via satellite, where the downlink is provided using MPE and a telephone modem as an uplink. The DSR02 is also able to decode MPE IP datagrams that contain audio data (see section Demux & Decode).

In order to control distribution of data, as all receivers receive the same data, MPE sections include a DVB Media Access Control (MAC) address, similar to the Ethernet MAC address. This DVB MAC address can be used to filter MPE sections, because each receiver can be given a unique DVB MAC address and receivers with no corresponding address will drop the section in question. Filtering can be applied to target single, a group of or all devices by selecting how many of the DVB MAC address bytes are used for filtering by the receiver. Note, that filtering is always setup and applied on the receiving end, not by the sending side.

Decoded IP packets are put out on the 1000Base-T Interface.

MPE demultiplexing is configured using the menu as follows:

In the first block, general settings are made and packet filtering can be set up.

MPE / Data Piping:	Enable or disable MPE demultiplexing functionality.
Layer 2 -- Bridge to LAN Settings	Click on  to get to the sub-menu to set up Layer2 bridging. See below for further explanation.
Layer 3 IP Routing	Click on  to get to the sub-menu to set up Layer 3 routing. See below for further explanation.
Layer 3 IP Filtering	Click on  to get to the sub-menu to set up Layer 3 filtering. See below for further explanation
MPE MAC Address:	Six byte DVB MAC address in hexadecimal representation. Note that each byte has to be represented by two characters, i.e. hex “0” by “00”, 12 characters in total. The address can be entered with or without dashes in between each byte, as they will be added automatically upon successful saving. Example: “FE-00-11-99-DC-BA”
MPE MAC Filter:	Defines how many of the DVB MAC address bytes (MPE MAC Address) of the receiver are compared to the MAC address included in the MPE table. Options are no filtering (deactivate) or one to six bytes, counting from most significant byte to least significant byte, i.e. a setting of 2 bytes will only compare the “FE-00” portion of above example with the address in

the MPE section table.

In the second block, the individual PIDs containing MPE data to be processed are configured.

PID: Up to 16 PIDs containing MPE sections can be configured for MPE demultiplexing. PIDs are entered in decimal format. In order to deactivate MPE demultiplexing for a certain PID, set the PID to 0. Entering a wrong PID has no negative effect, apart from using up one demultiplexing slot.

NOTE: MPE is decoded from the same source, that is used in "Demux & Decode" (menu item "TS Processing → Demux & Decode").

MPE Packet Filtering in General

The following Figure 9 illustrates how MPE IP packets are filtered:

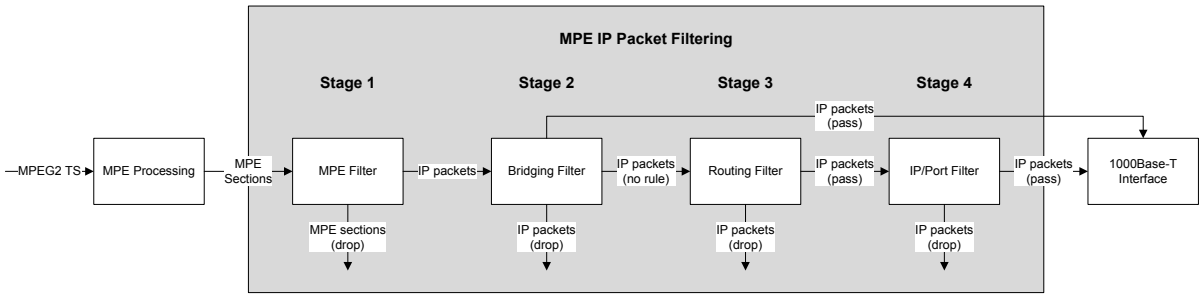


Figure 9: MPE Packet Filtering

There are four filtering stages an IP packet can pass through:

Stage 1 MPE sections are first compared with the MPE MAC Filter. If a section passes through the filter, the MPE section is disassembled and the included IP packet is forwarded to the next stage. MPE sections that do not pass this filter are dropped.

Stage 2 The destination address of the IP Packet is checked for type and then compared with the Layer 2 bridging table. If the type of the destination address (unicast, multicast or broadcast) is deactivated, the packet is dropped, otherwise the address is compared to the bridging table and the packet will bedropped or passed on to the 1000Base-T interface. If there is no active rule, the packet is passed to to the next stage.

Stage 3 In this stage rules can be set up to further narrow down packet output. A general rule regarding Unicast or Multicast can be applied

or if those rule don't apply or are activated, IP packets can be filtered by source and destination IP address ranges. Packets that pass through this filter stage are then passed on to the last stage, others are dropped.

Stage 4 The last stage is used to filter outgoing traffic by IP address and/or port of source and/or destination address. Packets that pass the filter are then passed on to the 1000Base-T interface.

MPE Layer 2 - Bridge to LAN Settings

This menu is used to configure MPE Layer 2 bridging. As there are no MAC addresses in multiprotocol encapsulated IP packets, the destination IP addresses are used as a. First of all, bridging can be enabled for broadcast, multicast and/or unicast packets. If a packet falls under one of these three categories and the category is enabled, the packet is then compared to the bridging filter table. Packets can either be accepted or removed by the filter. If accepted, a packet is then forwarded to the 1000Base-T Interface. Packets in an enabled category that have no filter rule are passed on to the routing filter.

Rules are executed from top to bottom. If a packet fits, i.e. the first rule, then the other rules will not be applied anymore!

There are two blocks in this menu, each of which needs to be saved individually after changes were made.

The first block is used to control bridging categories.

Broadcast Bridging: When enabled, all broadcast traffic will be forwarded to the bridging filter table.

Multicast Bridging: When enabled, all multicast traffic will be forwarded to the bridging filter table.

Unicast Bridging: When enabled, all unicast traffic will be forwarded to the bridging filter table.

The second block is used to configure up to 16 bridging filter rules.

Destination Address: Destination IP address of IP packet.

Netmask: Netmask corresponding to the IP address. The netmask is entered in decimal corresponding with the number of bits set in the netmask, i.e. 8 for 255.0.0.0 or 24 for 255.255.255.0.

Action: Choose between "accept" (forward to 1000Base-T Interface), "remove" (drop packet) or "unused" (disable filter rule).

There is one special rule, when choosing address "0.0.0.0" and netmask "0" this rule is applied to any packet. As rules are executed from top to bottom, you can use this special rule to drop all other packets by putting this rule at the bottom of the rule set. In this case, set Action to "remove". Alternatively, you can forward all other packets by choosing "accept", in case the previous rules were set to remove packets. This is necessary when there are no routing and IP filters set up, since all packets without a rule will be passed on by a configured filter and dropped by an unconfigured filter (see Figure YYY). This way, the next two stages can be bypassed.

Example 1

Dest. Address	Mask	Action	Comment
192.168.45.0	24	Accept	Forward any packet from 192.168.45.0 to 192.168.45.255
192.168.46.0	24	Remove	Drop any packet from 192.168.46.0 to 192.168.46.255
0.0.0.0	0	unused	Forward all other packets to routing filter stage

Example 2

Dest. Address	Mask	Action	Comment
192.168.45.0	24	Accept	Forward any packet from 192.168.45.0 to 192.168.45.255
0.0.0.0	0	Remove	Drop all other packets (no further filtering necessary)

Example 3

Dest. Address	Mask	Action	Comment
192.168.45.0	24	Remove	Drop any packet from 192.168.45.0 to 192.168.45.255
192.168.46.0	24	Remove	Drop any packet from 192.168.46.0 to 192.168.46.255
0.0.0.0	0	Accept	Forward all other packets (bypassing further

			filtering)

MPE Layer 3 - IP Routing

This menu is used to configure MPE Layer 3 IP routing. IP packets that are forwarded by the bridging filter are processed by the routing filter. Packets that pass the routing filter are passed on to the IP filter, all other packets are dropped. Thus it is important to make sure, that packets that are to be processed by the IP filter, need to clear the routing filter first.

There are two blocks to configure routing parameters, each block need to be configured and saved individually:

The first block is used to set up general routing processing.

Multicast Routing: When enabled, all multicast packets forwarded from the previous filter will be processed. "Default Multicast Route" selects the general behavior: "Accept" meaning, forward all packets unless a filter applies, "Remove" meaning, forward only packets that a filter allows to pass.

Unicast Routing: When enabled, all unicast packets forwarded from the previous filter will be processed. Here "Default Unicast Route" works different: "Accept" forwards all unicast packets to the IP filter in the next stage, whereas "Remove" only forwards packets to the next stage that are in the same subnet as the 1000Base-T interface.

The second block "Multicast Routing" is used to configure multicast routing rules. IP address "0.0.0.0" in combination with netmask "0" act as a wildcard.

Source Address: Source IP address of IP packet.

Source Mask: Netmask corresponding to the source IP address. The netmask is entered in decimal corresponding with the number of bits set in the netmask, i.e. 8 for 255.0.0.0 or 24 for 255.255.255.0.

Destination Address: Destination IP address of IP packet.

Destination Mask: Netmask corresponding to the destination IP address. The netmask is entered in decimal corresponding with the number of bits set in the netmask, i.e. 8 for 255.0.0.0 or 24 for 255.255.255.0.

Action: Choose between "accept" (forward to next filter stage), "remove" (drop packet) or "unused" (disable filter rule).

Example 1

Src. Addr.	Mask	Dest. Addr.	Mask	Action	Comment
0.0.0.0	0	228.0.0.18	24	Accept	Accept all packet to destinations 228.0.0.0 till 228.0.0.255 from any source address

Example 2

Src. Addr.	Mask	Dest. Addr.	Mask	Action	Comment
192.168.0.45	32	0.0.0.0	0	Accept	Accept packets from source address 192.168.0.45 to all destinations

Example 3

Src. Addr.	Mask	Dest. Addr.	Mask	Action	Comment
192.168.0.45	32	228.0.0.18	32	Accept	Accept packets from source address 192.168.0.45 to destination address 228.0.0.18

MPE Layer 3 IP Filtering

This menu is used to configure MPE Layer 3 IP Filtering. Filter rules consist of source IP address, source port, destination IP address and/or destination port in any given combination. IP packets that are forwarded by the routing filter are processed by the IP filter. Packets that pass the IP filter are passed on to the 1000Base-T interface, all other packets are dropped. Thus it is important to make sure, that packets that are to be processed by the IP filter, need to clear the bridging and routing filters first.

There are two blocks to configure IP filtering parameters, each block need to be configured and saved individually:

The first block is used to set up general filter processing.

Default Rule: "Default Rule" selects the general behavior: "Accept" meaning, forward all packets unless a filter applies, "Remove" meaning, forward only packets that a filter specifically allows to pass.

The second block is used to set up filter rules. IP address "0.0.0.0" and port "0" act as wildcards.

Source Address: Source IP address of IP packet.

Source Port: Source port address of IP packet.

Destination Address: Destination IP address of IP packet.

Destination Port: Destination port address of IP packet.

Action: Choose between "accept" (forward to 1000Base-T interface), "remove" (drop packet) or "unused" (disable filter rule).

Example 1

Src. Addr.	Port	Dest. Addr.	Port	Action	Comment
0.0.0.0	0	228.0.0.18	1024	Accept	Accept all packets to destination IP address 228.0.0.18 port 1024

Example 2

Src. Addr.	Port	Dest. Addr.	Port	Action	Comment
192.168.0.45	2000	0.0.0.0	0	Accept	Accept all packet from source address 192.168.0.45 port 2000

Example 3

Src. Addr.	Port	Dest. Addr.	Port	Action	Comment
192.168.0.45	2001	0.0.0.0	0	Remove	Drop all packets from source address 192.168.0.45 port 2001

10.6 Interface Settings

10.6.1 XLR: configuration of audio level and 15kHz low pass filter

This menu item is available under "Interface Settings→XLR" and is used to adjust the output level of the XLR outputs, separately for the analog outputs and digital AES/EBU outputs. Adjustable range: -36…+6 dB (related to the received signal).

Additionally a 15 kHz low pass filter can be activated to suppress unwanted audio signals that may exist above this frequency, useful when feeding audio directly into FM-transmitters or older stereo encoders.

LCD-menu: Interface→XLR

10.6.2 Headphone: adjusting headphone audio volume

This menu item is available under "Interface Settings→Headphone" and is used to adjust the volume at the headphone output. Adjustable range: -36…+6 dB (related to the received signal).

LCD-menu: Interface→Headphone

10.6.3 DTE: configuration of the serial RS-232 interfaces

This menu item is available under "Interface Settings→DTE" and is used to configure the serial RS-232 interfaces Front-DTE, DTE1 and DTE2 of the device. Configurable settings are the baud rate and the data activity timeout (DTE1 and DTE2 only). To activate the data activity timeout, set the value different from zero.

If the timeout (≥ Version 6.28) is activated, the DTE server will end the connection with the client when the data distribution has been finished after the configured time interval (min).

Under "Interface Settings→DTE" you can set baud rates for DTE1 and DTE2. Possible baud rates: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud.

LCD-menu: Interface→Front-DTE / DTE1 / DTE2

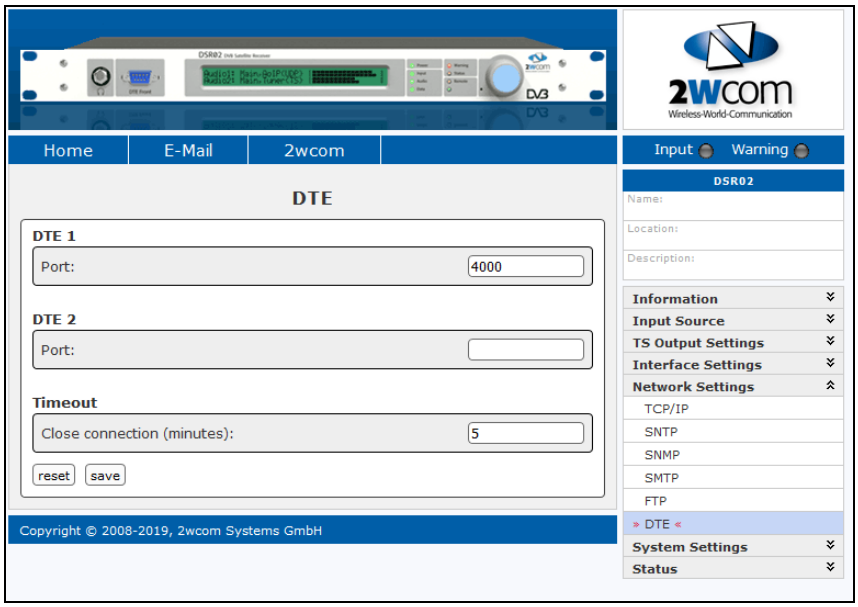


Figure 10: DTE timeout settings (≥ Version 6.28)

10.6.4 Relay: relay configuration

This menu item is available under "Interface Settings→Relay" and is used to configure the relay outputs of the device.

State: This block represents the actual state of the relays. Relays 1-6 are simple switches, whereas relay 7 is a dual pole relay.

Settings: Relays functions can be inverted here. Also the brownout function (typically assigned to relay 7) can be assigned to another relay. This will override its original function though.

10.6.5 Optical Coupler: optical coupler configuration

This menu item is available under "Interface Settings→Optical Coupler" and is used to configure the optical coupler inputs of the device.

State: This block represents the actual state of the optical couplers, i.e. if the input is active or inactive.

Settings: Each coupler input can be assigned to switch audio playback from satellite audio, to redundant audio streaming server 1, server 2 or to both (see redundant audio source on page 27).

10.7 Network Settings

10.7.1 TCP/IP: configuration of the Ethernet interfaces

Control Interface (10/100)

This menu item is available under "Network Settings→TCP/IP" and is used to configure the Ethernet interface (control/monitoring) of the device. Configurable settings are the IP-address, netmask, gateway, and the http port.

IP-address	Individual address that is necessary to identify hardware in an IP network like the internet or intranet.
Subnet mask	Bit mask, which separates an IP address into a network part and a host part.
Gateway	Address of the local system that is used for the internet access (e.g. the router).
Primary DNS	IP address of the primary Domain Name Service (DNS) server.
Secondary DNS	IP address of the secondary Domain Name Service (DNS) server.
MTU	Maximum Transmission Unit - The largest physical packet size, measured in bytes that the network can transmit.
Http port	The port that is used for the data connection between device and internet browser (default port: 80).

The necessary address settings above depend on the individual network and should be assigned by the responsible network administrator if applicable.

LCD-menu: Interface→IP

Data Interface (10/100/1000)

Prerequisite: DSR02

This menu item is available under "Network Settings→TCP/IP" and is used to configure the Gigabit-Ethernet interface (TS-streaming) of the device. Configurable settings are the IP-address, netmask, and gateway.

IP-address	Individual address that is necessary to identify hardware in an IP network like the internet or intranet.
Subnet mask	Bit mask, which separates an IP address into a network part and a host part.
Gateway	Address of the local system that is used for the internet access (e.g. the router).

The necessary address settings above depend on the individual network and should be assigned by the responsible network administrator if applicable.

10.7.2 SNTP: date and time setup

This menu item is available under "Network Settings→SNTP" and is used to enable the synchronization of the devices date and time with an external SNTP server. It is also possible to setup the date and time manually.

SNTP settings:

1. SNTP Server IP	IP address of the first NTP server to be used.
2. SNTP Server IP	IP address of the second NTP server to be used.
Update interval [min. 30 sec]	Time interval for synchronizing the device clock with the NTP server in seconds.
Time zone	Time shift between the time of the NTP server and the local time in hours.
Synchronisation	Selection if the device clock should be synchronized via SNTP or not.

Time and date settings:

Present device time and date	The present time and date of the device clock.
New time [hh:mm:ss]	Input to manually set the device clock to a specific time (24h format).
New date [dd.mm.yyyy]	Input to manually set the device clock to a specific date.

LCD-menu: Interface→IP

10.7.3 SNMP: SNMP configuration

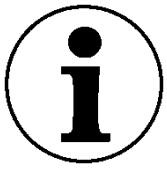
As part of the monitoring function, the device is capable to send SNMP traps to the defined IP addresses of the SNMP managers. It is also possible to readout device settings via SNMP Get.

This menu item is available under "Network Settings→SNMP" and is used to setup the IP addresses of the SNMP managers.

Additionally access data (read community / write community) that is necessary for external SNMP requests to device can be configured here.

First manager	IP address of the first SNMP manager that receives SNMP traps. The trap sending to this address can also be deactivated by a checking "off" at "Send trap:".
Second manager	IP address of the second SNMP manager that receives SNMP traps. The trap sending to this address can also be deactivated by a checking "off" at "Send trap:".
Read community	SNMP access data for the external read SNMP access to the device.
Write community	SNMP access data for the external write SNMP access to the device.

LCD menu: Interface→IP

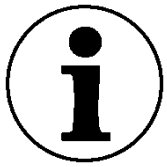


NOTE: In order for the SNMP manager tool to operate correctly, it requires the DSR01/DSR02 specific MIB files. These MIB files need to be compiled by the SNMP manager tool and are provided on the setup CD or via email.

SNMP traps used by the monitoring function:

Trap No.	Trap Name	Monitoring Function
1	rfInputState	RF Level (value in dBm)
2	lockedState	RF signal status (detected/not detected)
3	ViterbiBerState	Bit Error Rate (Value)
4	cnState	Calculated Carrier/Noise Ratio (Value in dB)
5	ts	Transport Stream Detection (detected/not detected)

6	audioState	Audio Status (detected/not detected)[1)]
7	dte1DataAvailable	DTE1 Interface Status (active/not active)
8	dte2DataAvailable	DTE2 Interface Status (active/not active)



NOTE: Each activated trap will be sent once at startup for initialization.

1) DSR01 Easy: No audio monitoring; DSR01 Basic / DSR02: audioState 1 and 2

10.8 System Settings

10.8.1 Global settings: device parameters and settings

This menu item is available under "System Settings→Global" and is used to execute basic device functions and retrieve basic device data:

System parameter – device identification

This block can be used to assign a device description (i.e. "S/N:00001584"), name (i.e. "DSR01") and location (i.e. "Tower X198,Y612"). These device identification parameters are also included in the SNMP traps. If the SNMP management application does not support special characters, they should not be used in the device identification parameters.

System information – serial number, rights, firmware versions, etc.

This block contains information about device uptime, serial number, device type, version numbers, device rights and device temperature.

Upload Settings – restore device settings

This dialog can be used to upload a device settings file to the DSR01/DSR02. Settings can be downloaded from the device using the "Download settings" dialog on the same page. To upload a setting file, click "Browse…" locate and select the settings file and click upload. Note that upload times can vary and must not be interrupted. After a successful upload the user is prompted to reboot the device.

Firmware Update

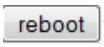
This dialog can be used to update a devices firmware. To upload a firmware setting file, click "Browse…" locate and select the firmware file and click update. Note that upload times can vary and must not be interrupted. After a successful

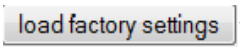
upload the user is prompted to reboot the device. Accidental interruption (user or network) of the upload has no impact on the device's functioning. It can simply be restarted. Firmware uploads are protected by CRC.

Download Settings

This dialog can be used to download and backup the current device settings of the DSR01/DSR02 (including all presets) to file in order to be able to upload them at a later date. Also this file can be used to configure others devices with the exact same settings, i.e. redundancy devices. Settings can be uploaded to the device using the "Upload settings" dialog on the same page. To download the current device settings to file, click "download" and locate a folder to save it to.

Reboot and Factory Settings

These two dialogs can be used to manually reboot the device (click 

) and to reset the user configurable device parameters to factory settings (click 

). Note that in the latter case **all** user configurable data, with the exception of the device's control interface IP address data (web interface), is deleted! This also includes the user accounts, which will be reset to the default described in this manual.

10.8.2 User: device access control configuration

This menu item is available under "System Settings→User" and is used to change user access control to the device. Note that without valid user access data, the device cannot be configured via web interface. The admin account has unlimited read/write control over the device, whereas the guest account is only able to read.

If you lost your login data please contact the manufacturer for further instructions how to regain access to the device.

10.8.3 Preset: station preset configuration, activation, and copying

This menu item is available under "System Settings→User" and is used to name, activate and copy the eight presets. A preset is a complete device configuration set that can be used to switch in between different configurations (with 2 audio programs to be decoded each). Up to 8 different presets can be used per device. Presets enable a quick and comfortable switching between different device configurations, i.e. switching from a national broadcast to a localized news broadcast or localized advertisement broadcast. In this scenario the audio fading option is helpful, as it allows for a smooth (audio) transfer in between preset switches, by fading out the old broadcast, switching the preset and fading in the new broadcast.

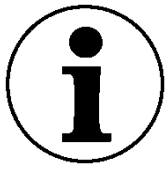
Preset changes can also be triggered by the relay inputs, allowing the device to be used for redundancy purposes by an external device.

Preset name: Assign a name to the current preset.

Selected preset: Select the desired station preset.

Save present preset in: This can be used to copy the current preset select into another preset, overwriting it in the process.

Changes need to be applied and saved individually block by block, since only data associated with a save button (block) is stored.



NOTE: Any change in any setting is stored to the current preset immediately and as such there is no need to save changes to a preset.

IP interface settings are excluded from preset data however, as those are meant to be static.

LCD-menu: Settings→Preset

10.8.4 Alarm: monitoring and alarm configuration

This menu item is available under "System Settings→Alarm" and is used to configure a monitoring of RF parameter, PID parameter, as well as the RS-232 DTE interfaces. If monitoring triggers an alarm, the device can send SNMP traps, can switch one of the seven integrated relays and can activate the "Warning" LED on the web interface and the front panel of the device. The alarms can also be used to trigger some special features of the device, i.e. the redundancy audio source function (see chapter "Internal Storage: internal SD card configuration", page 29), where audio is played back from an internal memory card.

The monitoring functions have an alarm activation delay time (T1) and some also have an alarm reset delay time (T2) in seconds.

Every monitoring function has a checkbox "warning LED on" to select if the "Warning" LED on the web interface and the front panel of the device is activated on alarms or not.

Every monitoring function can be activated or deactivated with the "alarm enable" checkbox.

Every monitoring function provides a red status LED that indicates a detected alarm if the corresponding alarm monitoring is active.

Monitoring Functions:

Input:	Monitors the RF level at the RF-IN input for significant variations. It is possible to define a reference level and a tolerance range. Unit: dBm
RF unlocked:	Monitors the RF level at the RF-IN input for a lost of the signal.
Vit./LDPC BER:	Monitors the detected bit error rate (BER) in front of the Viterbi decoder of the decoded signal.
C/N:	Monitors the calculated signal carrier/noise ratio. Unit: dB
TS:	Monitors for a loss of the positive transport stream (TS) detection.
Audio 1:	Monitors the signal for a loss of the positive audio stream 1 detection.
Audio 2:	Monitors the signal for a loss of the positive audio stream 2 detection.
DTE 1:	Monitors the DTE 1 interface for data inactivity. If the monitoring is activated and active data is detected, the green LED "data" on the front panel of device is activated.
DTE 2:	Monitors the DTE 2 interface for data inactivity. If the monitoring is activated and active data is detected, the green LED to the right side of the "Data" LED on the front panel of device is activated.

NOTE: As several alarms can be assigned to the same relay, on problems with a relay activation, it should be checked if the relay is already activated by another alarm.

10.8.5 Remote Control: controlling the device over a satellite connection

Prerequisite: Control via satellite carrier

Using remote control, it is possible to control and service the DSR01/02 via satellite, without the need for a physical connection. Remote control is primarily intended for the servicing of remote locations, which often lack fast internet connections, but can also be used to service the entire network via satellite.

Devices can be addressed by device type, serial number, group name or group number, allowing the controller (the embedded 2wcom Controller EC01) to apply

individual updates, i.e. change a devices preset, or target groups of devices, i.e. update the firmware of all tuned in DSR01s.

Remote control can be used to do the following:

Firmware updates:	New device firmware can be uploaded using remote control and is stored until the controller sends an activation command, enabling the controller to precisely time the update process in the network. All uploads are CRC protected and updates only take place if CRC check passes.
Change presets:	Presets can be changed using remote control.
Switch relays:	Relay states can be changed using remote control.
Device configurations:	A new device configuration file can be uploaded using remote control and is stored until the controller sends an activation command, enabling the controller to precisely time the update process in the network. All uploads are CRC protected and updates only take place if CRC check passes.
Upload files:	Different Files can be uploaded using remote control, for example audio files, playlists and audio scheduling files.
Switch programs:	You can switch presets, play back audio files from the SD card, switch audio PID and switch the redundant audio source via remote control.

The remote control data is encapsulated into UECP frames and transported via MPEG ancillary or private data sections. In order to use remote control, the DTE1/2 section of the PID containing the remote control data needs to be configured (see "PID configure: PID configuration in PID mode" on page 34).

This menu item is available under "System Settings→Remote Control" and is used to configure the access control to the device via remote control.

Device type:	Device type name, i.e. "DSR01" or "DSR02"
Group Number:	Assign the device to up to five groups, ranging from 0 to 255

10.9 Status

10.9.1 SAT Tuner: tuner status

This menu item is available under "Status→SAT Tuner" and is used to display the status of the tuner. The parameter of the received RF signal and the contained station signals including a signal quality statement (bit error rate) are shown.

C/N:	Calculated carrier/noise ratio of the signal. To avoid data errors, the decoding of a received signal requires a minimum C/N ratio that depends on the FEC rate. Unit: dB
CFO Error:	Carrier Frequency Offset – shows the frequency offset in respect to the current tuner frequency. Unit: MHz
Input:	Level of the RF signal at the "RF-In" input. Unit: dBm
AGC:	Tuner status AGC (Automatic Gain Control). "Bad" or "OK".
CE:	Tuner status CE (Carrier Frequency Offset Estimation). "Bad" or "OK".
Sym. Time:	Tuner status Symbol Timing. "Bad" or "OK" (configured symbol rate is detected).
Carr.:	Tuner status Carrier. "Bad" or "OK" (Phase & Frequency loop locked).
Viterbi (FEC):	Tuner status of the Viterbi error correction. "Bad" or "OK".
System:	Tuner status "Bad" or "OK" (all preceding OK).
Puncture Rate:	Ratio of protection bits and data bits of the Viterbi error correction.
Viterbi/LDPC BER:	Present bit error rate in front of the Viterbi error correction.
RS/BCH BER:	Present bit error rate in front of the Reed Solomon error correction.

LCD-menu: State→Tuner→Signal

LCD-menu: State→Tuner→LockState

LCD-menu: State>Tuner→Viterbi+RS

10.9.2 TS: display transport stream status

This menu item is available under "Status→TS" and is used to display details of the satellite transport stream.

State: Tuner detected the received data transport stream. "No" or "OK".

NID: Network Identification: Identity string of the received satellite (e.g. "Astra 19,2E").

LCD Menu: Status→Tuner→TS

10.9.3 Audio: display MPEG status

This menu item is available under "Status→MPEG" and is used to display parameter details of the received MPEG / AAC data.

Version: MPEG version of the received signal.

Layer: MPEG layer of the received signal or term "AAC".

Bit rate: Bit rate of the received signal. Unit: bit/s

Sample rate: Sample rate of the received MPEG signal. Unit: kHz

LCD Menu: Status→Tuner→MPEG

10.9.4 RDS Data: RDS data processing

Prerequisite: RDS decoder via web interface

This menu item is available under "Status→RDS Data" and is used to display details of UECP-encapsulated RDS data that is transmitted via DTE1 and DTE2. In case the transmitted data is not RDS data, the display fields stay empty.

10.9.5 Error Log

This menu item is available under "Status→Error Log" and is used to display a log with events that have occurred since the lists last reset. A printable list with a description and a timestamp is shown.

11. Interfaces

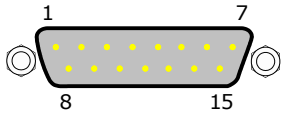
11.1 RF Inputs

RF - In	F-type jack; Input for the connection of the receiving LNB of the satellite antenna. The LNB supply voltage can be set to 13 V, 18 V, or 0 V (off) to set the LNB polarization*. Z=75 Ω. Admissible RF signal input range -82…-10 dBm * Depending on the hardware version, the LNB supply voltage may only be present if an LNB is connected.
RF - Bypass	No function.

11.2 Audio Outputs

Analog - L 1 / Analog – R 1	XLR male sockets; Outputs for the analog audio signal 1 with adjustable analog audio level, separately for the left (L) and the right (R) channel. (Z<20 Ω balanced)
AES/EBU 1	XLR male socket; Output for the digital audio signal 1 with adjustable digital audio level. (Z=110 Ω balanced) The sample rate of the signal depends on the received signal. The device supports 8…96 kHz.
X.21 - 1	(optional on request) 15 pole male D-Sub interface for the output of an MPEG data stream in X.21 protocol format.
Analog - L 2 / Analog – R 2	XLR male sockets; Outputs for the analog audio signal 2 with adjustable analog audio level, separately for the left (L) and the right (R) channel. (Z<20 Ω balanced)
AES/EBU 2	XLR male socket; Output for the digital audio signal 2 with adjustable digital audio level. (Z=110 Ω balanced) The sample rate of the signal depends on the received signal. The device supports 8…96 kHz.
X.21 - 2	(optional on request) 15 pole male D-Sub interface; No function
Headphone jack	6.3 mm / 1/4” jack for the output of the audio signal 1 or 2 with adjustable signal level to connected headphones. (L/R, Z<10 Ω unbalanced)

Pin configuration of the X.21 connector (optional on request)



X-21-1 / X-21-2

Pin	*Function*
4	Receive +
11	Receive -
5	Control +
12	Control -
2	Transmit +
9	Transmit -

Pin	*Function*
3	Indication +
10	Indication -
6	Signal Timing +
13	Signal Timing -
8	GND

11.3 ASI Connectors

ASI In — BNC connector for the input of a DVB-ASI data stream (270 MHz) to be decoded by the device. Cable impedance: 75 Ω

ASI Out — BNC connector for the output of the DVB-ASI data stream from the ASI Input as a DVB-ASI data stream (270 MHz) after decoding, processing and encoding. Cable impedance: 75 Ω

DSR02: It is also possible to output the DVB-S/DVB-S2 data from the tuner in the DVB-ASI format.

11.4 Ethernet Sockets

10/100/1000-Base-T — RJ-45 socket for the connection to an IP network. The IP connection is used to output a MPEG2 transport stream, that was previously captured with the DVB-ASI input or DVB-S/S2 tuner card.

10/100-Base-T — RJ-45 socket for the connection to an IP network. The IP connection can be used for SNMP and to operate the device via the integrated web interface.

As an option a function for the output of "Private Data", "MPEG ancillary data (IRT)" or MPEG audio is available.

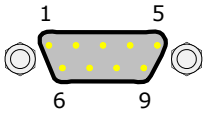
The default IP address / network mask of the 10/100-Base-T interface is "192.168.14.250" / "255.255.255.0". If these setting were changed but not

documented and so you cannot access the web interface of the device, you can do the following:

Devices with LCD/jog dial:	Configure the IP settings at the device with the LCD/jog dial (LCD: Interface→IP).
Devices without LCD/jog dial:	Connect the "DTE Front" interface of the device with an RS-232 cross-over / null modem cable to an RS-232 interface of a computer. Open a terminal software (e.g. Microsoft HyperTerminal), make a connect with the "DTE Front" baud rate as configured in the device (default: 9600 baud) and the parameter 8N1, and use the following commands to setup the IP parameter: "set ipaddress=", "set gateway=", "set netmask=" (each without spaces and supplemented with the IP address to be set). Then enter reboot and hit ENTER for the changes to take effect. Example: "set ipaddress=192.168.14.250","set netmask= 255.255.255.0", then reboot.

Serial RS-232 Interfaces

DTE 1 / DTE 2



9 pole male D-Sub connectors for data communication. These can be used to output "Private Data" or "MPEG Ancillary Data (IRT)" of the received satellite signal.

Possible baud rates: 1200…115200 Baud.

Configuration: 8N1; Use a cross-over / null modem cable to connect.

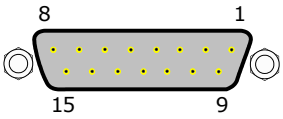
Pin configuration

Pin	*Function*
1	DCD
2	RXD
3	TXD
4	DTR
5	GND

Pin	*Function*
6	DSR
7	RTS
8	CTS
9	not connected

11.5 Optical Coupler Input

D-Sub female connector, 15 pole



Optical Coupler Input

Optical Coupler No.	*Control Pin No.*
1	1
2	2
3	3
4	4
5	5
6	6
7	7

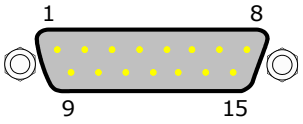
To actuate an optical coupler pull the corresponding control pin electrically to ground (pins 9,10,11,12,13,14,15). The control current is less than 5 mA.

NOTICE	
	Voltage on opto-isolated inputs must not be negative or exceeding +0.7 V!

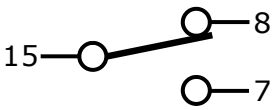
11.6 Relay Output

The DSR0x is either equipped with a D-Sub 15 pole male connector or a high density D-Sub 26 pole male connector on newer hardware revisions for more relay outputs (>=V1.22 for DSR01, >=V1.11 for DSR02). Additional relay outputs have to be ordered with the unit or the unit has to be sent back for servicing/upgrading at a later date.

D-Sub male connector, 15 pole



Relay Output

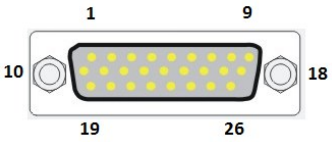
Relay No.	*Switch contacts*	*Switch type*
1	1,9	SPST, NO
2	2,10	SPST, NO
3	3,11	SPST, NO
4	4,12	SPST, NO
5	5,13	SPST, NO
6	6,14	SPST, NO
7		SPDT

The relays can be used for alerts of the monitoring function.

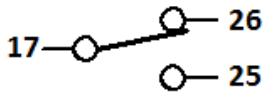
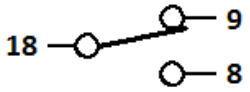
NOTICE	
	The relay contacts have a rating of 0.5 A at 125 V AC / 60 V DC. The maximum current is 1 A!

D-Sub male connector, high density,

26 pole



Relay Output

Relay No.		*Switch contacts*	*Switch type*
	*option**		
1	1	1,10	SPST, NO
2	2	11,19	SPST, NO
3	3	2,20	SPST, NO
4	4	3,12	SPST, NO
5	5	13,21	SPST, NO
6	6	4,22	SPST, NO
	7	5,14	SPST, NO
	8	15,23	SPST, NO
	9	6,24	SPST, NO
	10	7,16	SPST, NO
7	11		SPDT
	12		SPDT

The relays can be used for alerts of the monitoring function.

option* Relay numbers 7, 8, 9, 10, 11 and 12 are available only when the additional relay outputs hardware option was purchased.

NOTICE	
	The relay contacts have a rating of 0.5 A at 125 V AC / 60 V DC. The maximum current is 1 A!

11.7 Relay Output controlled by QBIT Q561 inputs

The DSR01/2 Relay closures can be remotely controlled by the inputs of the QBIT Q561.
To activate the processing of the relay switching commands of the QBIT Q561, the remote control function of the DSR01/2 has to be enabled in PID 8190 with private data and elementary stream mode. See chapter “System Settings: Remote Control”.

12. Maintenance & Servicing

12.1 Maintenance

No special maintenance is necessary on the device. Dust can be removed by a dry cleaning cloth / duster. For cleaning use only neutral, non-corrosive detergents applied to a cloth - not the device.

12.2 Servicing

The modules of the device are complex, and should be serviced only by authorized personnel.

The 2wcom GmbH is equipped with special measurement and repair kits. Therefore a repair by the user is not intended.

12.3 Calibration

Due to the design and construction of the device, no calibration is necessary.

13. Troubleshooting

The following chart is designed to help you to correct minor problems with the use of the device prior to contact our service department (report failures by email to *contact@2wcom.com* or fax to +49 461-662830-11). Also be sure to read the entire manual carefully, as this often helps in understanding and fixing typical problems.

Problem	**Possible Cause**	**Solution**
Device does not turn on	• Power cable is improperly connected • Mains supply failure • Blown fuse	• Check supply cord • Make sure that the power plug at the device is fully inserted • Check mains supply • Replace fuse by same type
No satellite reception	• Antenna cable improperly connected • Alignment of satellite antenna not correct • The LNB outputs an L-band signal with a high frequency offset.	• Connect antenna cable with F-type plug to the RF-In jack of the device. • Precisely align the satellite antenna to satellite azimuth and elevation setting with the lobe area free of obstacles. • Try to alter the tuner frequency +-250 kHz, use a high quality LNB.
Faulty reception	• L-Band signal interference	• Use only high quality, double-shielded antenna cable to avoid coupling of other signals (e.g. DECT cordless phones, GSM1800/1900 mobile phones etc.).
Device cannot be operated via Ethernet	• Network cable not connected • IP address / TCP port is not known. • A device with the same IP address was connected a few minutes before. Then the ARP table still assigns the old MAC address to the IP address.	• Connect the network cable. • Use the default address 192.168.14.250. If the address was changed and is not known please see page 57. • Usually the ARP table is refreshed automatically after a few minutes by the operation system. For an instant access to the device please reset the ARP table of your computer e.g. by entering “arp –d” in the Windows Command Prompt.

14. Technical Data

DSR01 DVB satellite receiver

Transport stream inputs

- DVB-S/S2 (single and multiple channel per carrier)
  - 0.128 .. 45 MSym/s (QPSK, 8PSK)
  - 0.064 .. 45 MSym/s (Tuner modules 16 & 32 APSK optional)

Redundancy

- Optional: IP-audio streaming input as back-up solution
- Optional: Enhanced integrated memory as additional back-up solution

Audio output

- 1-2 balanced analogue or digital AES/EBU (integrated XLR-3 connector)

Data output (e.g. RDS, DRM)

- Serial, IP (on request X.21 interface)
- Optional: 2 additional RS232 outputs

Decoding

- Audio decoding (professional MPEG decoder): MPEG 1/2 Layer 1,2,3
  (optional: MPEG 2/4 AAC LC/LD, HEv 1&v2, linear PCM, E-aptX)
- RDS decoding (built in RDS/UECP decoder)

Control / local commercials

- Via web interface
- FlexSource-SW
  Free selectable input sources, automatic monitoring, securing, synchronization, backup, switching, professional status page and program table for satellite transponder, adjustable audio delay, crossfading between audio streams
- Optional: SIRC - Satellite In-Band Remote Control (e.g. relay switching, regional advertising).
- New! SIRC's Google maps feature offers the possibility to distribute regionalized commands or actions and to receive e.g. health reports from satellite receivers of a certain region.
- SNMP v2c

Monitoring

- RF and MPEG parameters via SNMP v2c and relay
- Monitoring of up to eight audio programs via IP

Sync FM

- Prepared for synchronized FM transmission within FM SFN Network

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Standard

Feature list	DSR01 Basic	FlexDSR02+/04+
DVB-S/S2 tuner (0.256 .. 45 Msysm/s)	X	X
Headphone output	X	X
2x serial output for RDS (+1 front: service)	X	X
7x opto isolated in and 12x floating relays out	X	X
1x audio interface analogue or 1x digital AES/EBU	X	X→FlexDSR04+: 4x
15 kHz low pass filter	X	X
Adjustable audio delay	X	X
TCP/IP and web interface	X	X
Display and jogwheel	X	X
SNMPv2c	X	X
RDS/UECP monitor	X	X
DVB-ASI (in- and output)	X	X
Transport stream over Gigabit IP (in and out)	X	X

Options

Feature list	DSR01 Basic	FlexDSR02+/04+
Transportstream input		
DVB-S/S2 tuner incl. low symbol rates (min. 128 kSym/s)	X	X
DVB-S/S2 tuner module 16 APSK - A/B switching and PL scrambling	X	X
Redundancy input		
IP-audio streaming input as a back-up solution	X	X
Enhanced integrated memory as additional back-up solution	X	X
Audio output		
2x X.21 interfaces	…X1)	X1) not FlexDSR04+
Additional 1x audio interface Analogue and 1x AES/EBU	X	X→not FlexDSR04+
Data output		
IP data output (e.g. RDS, DRM)	X	X
Up to 4 RS232 outputs and 24 relays (in- and output)	X2)	X2)
2 additional RS232 outputs	X2)	X2)
Monitoring		
IP audio streaming for monitoring purpose	X	X
Decoding		
Audio decoding: MP2/4/AAC-LC/AAC+ HE v1 & v2	X	X
Control		
In-band control via satellite (e.g. relay switching, regional advertising)	X	X
Central server for satellite in-band control (generation of network control data) only in combination with option in-band control via satellite	X	X
Scrambling		
2wcom encryption	X	X
BISS decryption		FlexDSR04+ only

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Technical details 1/3

Inputs

RF	F-jack female
Frequency	950 .. 2.150 MHz, step 1 kHz all LNB oscillator frequencies possible
Input level, impedance	-75 .. -20 dBm, 75 Ω
LNB control	13 V vertical, 18 V horizontal, off 0 kHz low band, 22kHz high band
Noise figure	typical 6dB, max. 12 dB

Outputs

Audio

Digital reference	-9 dBFS (adjustable)
Volume	-32 .. +6 dB
Filtering	Switchable 15 kHz Low-Pass
Harmonic distortion	<0.05 % / <-66 dB (40 Hz .. 10 kHz)
Frequency response	<0.2 dB (20 Hz .. 20 kHz)
Digital	AES/EBU, 110 Ω bal., integrated XLR-3 1x Stereo (optional 2x Stereo)
Analogue	L/R, <20 Ω bal., integrated XLR-3 1x stereo (optional 2x stereo)
Headphone	L/R, <10 Ω, 6.3 mm
X.21*	(* possible development - may be changed for RS232 interfaces)
Data	MPEG audio
Connector	15 pole sub-D male

Control & monitor

Ethernet

Data	Controlling and setup functions
Optional:	Private data, MPEG ancillary data, UECP/RDS, MPEG audio (acc. to TR 101 154)
Connector	RJ45
Type	Auto switching 10/100 BASE-T
Protocol	HTTP, SNMPv2c, SMTP, UDP

Contact closure

Inputs	7 opto isolated inputs (excludes option: 24 relay contacts) 15 pole sub-D female
Outputs	12 floating relays (10x SPST, 2x SPDT) (for DC: max. 30 V, 1 A, 10 W) 26 pole sub-D male
Optional:	24 floating relays (excludes: 7 opto isolated inputs)
Serial	3x RS-232C (1 front, 2 rear)
Data	Private data or MPEG ancillary data, UECP/RDS (acc. to TR 101 154)
Connector	9 pole sub-D male
Transmission rate	1200 to 115200 baud, asynchronous

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Technical details 2/3

Front panel

LCDisplay	2x 40 characters
Jog wheel	Impulse, ENTER button
8 LEDs	Power, signal, warning, status, alarm, remote

MPEG decoding

	acc. To ETSI TR 101 154
No. of decoders	up to 2
adjustable delay	10 .. 1000 ms
Codecs	MPEG 1&2 layer 1, 2, 3
Optional:	MPEG 2/4 AAC LC/LD, HEv1&v2, linear PCM, E-aptX, other codecs
Analogue & digital audio data rate	32 .. 384 kbps, selectable

Audio performance

Output mode	Mono, dual mono, stereo
Peak output level	+18 dBu (optional +22 dBu) into 600Ω
Sampling rate	32, 44.1 or 48 kHz
Frequency response	0,2 dB; 20 Hz .. 20 kHz
Total harmonic distortion (THD)	< 0,05 %; 40 Hz .. 10 kHz
Cross talk	1kHz: > 100 dB, L&R 20 Hz .. 20 kHz: > 75 dB, L&R
Signal to noise ratio (A-weighted)	Digital: > 105 dB Analogue: > 95 dB

Satellite modulation

Tuner option 1 (standard)

DVB-S (EN 300 421)

Standard modulation/symbol rate	QPSK (0.128 .. 45 MSym/s)
Roll-off	0.35
FEC	Viterbi, Reed Solomon 1/2, 2/3, 3/4, 5/6, 6/7, 7/8
DVB-S2 (EN 302 307)	
Standard modulation/symbol rate	QPSK (0.128 .. 35 MSym/s)
FEC	LDPC, BCH 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
Modulation/symbol rate	8PSK (0.128 .. 31 MSym/s)
FEC	LDPC, BCH 3/5, 2/3, 3/4, 5/6, 8/9,9/10
Roll-off	0.20, 0.25, 0.35

Tuner option 2 (optional)

(High performance & advanced DVB-S2 processing functions)

DVB-S (EN 300 421)

Modulation/symbol rate	QPSK (0.064 .. 45 MSym/s)
Roll-off	0.35
FEC	Viterbi, Reed Solomon 1/2, 2/3, 3/4, 5/6, 6/7, 7/8
DVB-S2 (EN 302 307)	
Modulation/symbol rate	QPSK (0.064 .. 45 MSym/s) 8PSK (0.064 .. 45 MSym/s) 16 APSK (0.064 .. 45 MSym/s)
Modulation type	CCM
Frame type	Short, normal
Roll-off	0.20, 0.25, 0.35
FEC	LDPC, BCH 1/4, 1/3, 2/5,1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
Transport stream processing	Single transport stream
PL scrambling	ID 0 .. 262144
Input switching	Loop through, A/B switch (optional)

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Technical details 3/3

Advanced processing functions (optional)

Modulation/symbol rate	32 APSK (0.064 .. 38 MSym/s)
Modulation type	VCM, ACM
Transport stream processing	Single and multiple transport stream / single and multiple generic stream

All tuners

IF filter bandwidth	Automatic selection

General data

Power consumption	40 VA
Case dimensions	19“, 1 HU, Depth: 310 mm, Width: 424 mm, Front panel: 484 mm
Weight	<4 kg
Housing	Steel plate (aluminum-zinc coated)
Operating temp. range	0...+45°C
Storage temp. range	-40...+70°C
Power supply	Internal, 90...260 V, 47...63 Hz
Languages	English

Datasheet Version 10.09.2019

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