

MPX-1g FM-MPX Stereo/RDS Encoder

User Manual

MPX-1g User Manual V2.2.1

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1 About this Manual

You can download the latest version of this user manual here:

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<https://download.2wcom.com>



1.1 References and Hyperlinks in this PDF File

If you are reading this manual as a non-print version, please note that this PDF file contains bookmarks. You can navigate through the document via the content overview in your PDF viewing software if you enable bookmarks view.

All references to pages, sections, figures, and tables in the text identify a location within this PDF file. Click on the reference to jump to the referred passage in the text.

1.2 Tags and Their Meanings

The following signal words and signs warn you about risks and dangers:

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.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	Describes precautions necessary to protect the equipment.
	Contains useful information for the user.



Warning of general danger situation



Warning of electric shock



Warning of hot surface



Warning of fire hazard

2 For Your Safety

The device conforms to the relevant European directives and is safely constructed. Nevertheless, some residual dangers remain. 2wcom Systems GmbH accepts no liability for any damage caused by non-observance of the safety instructions.

- Read through this user manual carefully before using the device. If you pass on the device, be sure to also include this user manual.
- Any improper use of the device and all actions on the device not described in this user manual are considered as misuse outside the statutory limits for liability of the manufacturer.
- Only operate the device if it is in a technically perfect condition. If the device or a part of it is defective, take the device out of operation. Do not repair the device yourself. In case of any damages, send the device to 2wcom immediately for inspection or dispose of it properly according to the regional disposal regulations.
- Keep the device away from unauthorized persons.



Danger from electric current!

- Plug the device into a grounded power socket only. Never remove the grounding wire/contact.
- Do not open the housing of the device by yourself. Do not 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 when your hands are wet.
- Never expose the device to liquids. If any liquid gets inside the housing, immediately disconnect the device completely from the power supply. Do not continue operating the device.



Fire hazard due to overheating or electric current!

- Ensure sufficient heat dissipation during operation. Avoid the following when installing the device:
 - Non-ventilated environment, e.g. a narrow shelf or built-in cabinet
 - Extremely warm or cold place
 - Direct exposure to sunlight
 - Too high or too low temperatures
 - Extremely wet or dusty environment
- Do not cover the ventilation openings of the device to avoid heat accumulation.
- Do not operate the device in the presence of flammable gases.
- Do not place objects with open flames, such as burning candles, on the device.
- Do not place any heavy objects on the supply cord. A damaged cord can lead to fire or electric shock hazards.
- When disconnecting the supply cord, always pull on the plug, never on the cable, to avoid cord damage.



Danger from explosive atmosphere!

- Do not use the device in an explosive environment.



Warning of hot surface!

The device may heat up greatly during normal operation despite an active cooling system.

- Do not touch the surfaces of the device during or shortly after operation.



Risk of equipment damage!

- Before each use, check the housing, the front panel, the cable and the power plug for visible damage and defects (e.g. scratches, cracks, wear and tear, damaged insulation, improper plug connections or extension cables).
- If the power cord is damaged, immediately disconnect the power plug. Never use the device with a damaged power cord.
- All damaged components must be replaced immediately.
- Only use a grounded three-wire power supply cord and plug that complies with the national regulations.
- Make sure that the power socket is next to the device and readily accessible to the user.
- 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.
- Do not use corrosive detergents on the device such as benzene, thinner, alcohol or acetone. Clean the surface of the device with a soft, dry cloth only.

3 Product Overview

3.1 About the MPX-1g

The MPX-1g is an all-in-one RDS encoder, stereo encoder, AoIP / MPXoIP codec, and FM / DAB rebroadcast receiver.

The MPX-1g is designed for MPX generating. All components such as the stereo generator, RDS encoder or MPX-over-IP codec are flexibly combinable, thus saving rack space and money. Furthermore, the devices are RDS2 and μ MPX capable. In addition, all standards and protocols for Internet interoperability are supported.

Flexible in application: The MPX-1g enables assembling the whole MPX signal, including audio, pilot and RDS for high-quality and 100 % lossless transmission. If bandwidth economy is an issue the solution offers several opportunities starting at the stage of signal generation. It's possible to create the MPX signal just including audio and pilot. In this case, RDS data is forwarded separately or is only assembled at the regional studio located at the transmitter site. In addition, broadcasters can choose to use μ MPX for lower bandwidth IP connections and narrowband STL channels. Moreover, it is also possible to distribute the MPX signal via satellite by MPE encapsulation at the studio and by an optional satellite tuner available for 2wcom's receiving units.

High compatibility: To connect the studio and the MPX link, inputs for analog audio, AES/EBU and Audio over IP are provided (e.g. EBU TECH 3326, AES67, Ravenna, Livewire+, SMPTE ST 2110, PTP, PTPv2, SNMP, HTTP, HTTPS, FTP or FTPS). The MPX-1g supports all common RDS Standards: UECP 7.05 compliant, CENELEC EN 50067 and IEC 62106. In addition, the solution is compatible with Arcos Config and Arcos Network and is also ready for RDS 2.0.

Saving bandwidth: A full FM-MPX signal needs approx. 3.5 Mbyte IP data capacity. In addition, we can sample the signal with lower resolution bandwidth. By enabling the μ MPX mode, the MPX-1g will be able to reduce the bandwidth starting at 320 kbps.

Transmission robustness: The device provides 100% lossless audio encoding & decoding and uses Pro-MPEG FEC (Forward Error Correction) to reduce bit errors in the data stream. Furthermore, it provides dual streaming.

Smart management: The MPX-1g is fully configurable via a web interface or remotely via SNMPv2 and can be managed remotely via network, 2wcom's web-based platform for remotely managing broadcast devices. In addition, the device offers real-time statistics and monitoring of FM, RDS, MPX parameters and live on-air monitoring at transmitter sites is possible by a built-in RDS decoder.

Rebroadcasting: The optional FM / DAB tuner allows MPX generation and regionalization even in hard-to-reach locations. The RDS content can be regionalized, and all dynamic content is taken from the receiving RDS / DAB content. This receiving path can also be used as a backup solution.

3.2 Software Rights

Software rights enable additional functions. Some rights may be included in the base version of the product, others are available as an optional purchase. The following table displays an overview of the software rights that are available for the MPX-1g.

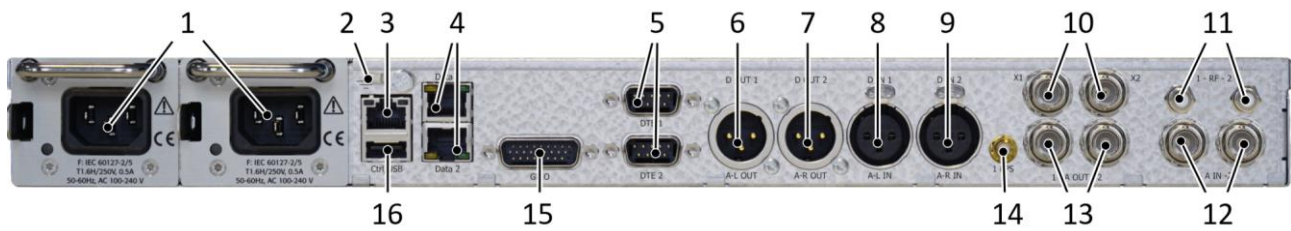
Right	Description
Alarm Receiver	Option to include an alarm receiver as an additional switch criterion for radio tuners.
Audio Output	Option to output the stereo encoder audio input signal via the analog XLR output for monitoring purposes.
Auto Config Mode	Option to automatically configure the device as an MPX decoder or as an RDS/stereo encoder depending on the type of the currently active input source.
Decoder	Number of decoders
Encoder	Number of encoders
FM/DAB Tuner	Option to use a FM/DAB tuner as an audio input
HLS decoder	Option to decode HTTP Live Streaming (HLS).
Kantar watermarking	Option to detect audio watermarks. Separate watermarking license agreement by Kantar Media required.
MPX Limiter	Option to calculate and adjust the modulation power and peak deviation for the stereo encoder.
Ravenna	SAP stream announcement and discovery and AES67, RTSP and PTP, PTPv2 support.
RDS Encoder	Option to encode RDS data. RDS standards: UECP 7.05 compliant, CENELEC EN50067. RDS coder with UECP fully dynamic data via IP or serial interface. Enables replacement of RDS data in the MPX/composite signal.
SAT Tuner	Right to use a SAT tuner as an audio/MPX input for processing purposes.
SFN	Single-frequency network: synchronous playout over the same frequency channel. Accuracy: < 1 μ s
SPN	Option to use SPN (synchronous playout network) for synchronous playout via NTP time server. Accuracy: < 20 ms
SRT Decoder	SRT and RIST functionalities for decoders
SRT Encoder	Option to use SRT or RIST for encoders.
Stereo Encoder	Option to use the device as an MPX stereo encoder.
TS Decoder	Transport stream over IP using UDP/RTP, unicast/multicast for decoders
μ MPX Decoder	Option to use μ MPX decoders.
μ MPX Encoder	Option to use μ MPX for encoders.

3.3 Front Panel



- 1 Headphone: 6.3 mm / 1/4" socket for the connection of headphones
- 2 LCD Screen: Illuminated LCD screen, graphical, 264x64 pixels
- 3 [Warning] LED: LED indicator for alarms. For more information see 11.1 Status LEDs.
- 4 [Input] LED: LED indicator for signal inputs. For more information see 11.1 Status LEDs.
- 5 [Output] LED: LED indicator for signal outputs. For more information see 11.1 Status LEDs.
- 6 [Power] LED: LED indicator for the dual power supply. For more information see 11.1 Status LEDs.
- 7 Reset pin hole: Recessed button for resetting the device (warm start and recovery mode)
- 8 Jog wheel: For operating the device via the LCD screen

3.4 Back Panel

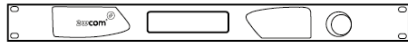


- 1 **Power supply:** Mains supply voltage through IEC socket.
Optional redundant power supply:
 - Option 1: standardized IEC hot-swappable power supply connector; 90-260 V, 47-63 Hz; automatic switchover.
 - Option 2: 48 V DC power supply (Neutrik powerCON).
 Flexible configuration allows for combination of 230 V AC and 48 V DC power supplies.
- 2 **Grounding stud:** This stud can be used to connect a grounding system if necessary.
- 3 **[Ctrl]:** RJ-45 connector, 10/100/1000 Base-T interface for controlling and monitoring the device via Ethernet. The device can communicate with the IP network and can be configured via the integrated web interface using an internet browser.
The LEDs show the link status (green, active if a physical network connection exists) and the activity status (yellow, active if data communication is active).
- 4 **[Data]:** 2x RJ-45 connector; 10/100/1000 Base-T interface for two redundant outputs for data, audio and GPIO transmission via Ethernet.
- 5 **[DTE]:** 2x 9-pole D-Sub male connector for serial RS-232C data communication.
- 6 **[D OUT][A-L OUT]:** AES/EBU male interface for the output of digital audio. Integrated XLR male socket for the output of the left channel of the analog audio signal.
- 7 **[D OUT][A-R OUT]:** AES/EBU male interface for the output of digital audio. Integrated XLR male socket for the output of the right channel of the analog audio signal.
- 8 **[D IN][A-L IN]:** AES/EBU female interface for the input of digital audio. Integrated XLR female socket for the input of the left channel of the analog audio signal.
- 9 **[D IN][A-R IN]:** AES/EBU female interface for the input of digital audio. Integrated XLR female socket for the input of the right channel of the analog audio signal.
- 10 **[X]:** (Optional) 2x BNC socket; input for expansion modules.
- 11 **[RF]:** (Optional) 2x 75 Ω F-type; antenna input for SAT or FM/DAB tuner.
- 12 **[A IN]:** 2x BNC socket, 50 Ω , input for analog signals.
- 13 **[A OUT]:** 2x BNC socket, 50 Ω , outputs for analog signals.
- 14 **[1PPS]:** SMA connector for 1PPS synchronization.
- 15 **[GPIO]:** 26-pole D-Sub male connector; combined connector for inputs (GPI) and outputs (GPO).
- 16 **[USB]:** USB 2.0 interface for service, configuration and firmware.

4 First Steps

4.1 Checking the Delivery Contents

Use the following list to check the completeness of delivery. The delivery contents may vary in exceptional cases.



MPX-1g



Link to product data



Power cord



Network patch cable

4.2 Installing the Device

For the device to operate safely, note the following regarding the location:

- Mount the device securely and stable in a 19-inch rack designed for this purpose.
- Avoid direct sunlight, direct proximity to radiators and air conditioners, dust, water and chemicals
- When setting up the device, make sure that it is placed at a suitable viewing angle to the displays and that the device has sufficient heat dissipation.

4.3 Connecting the Signals

Before connecting the device to the power supply, first connect the inputs and outputs of the device to the corresponding connectors:

1. For encoding, connect the signal inputs to [D IN 1/2]/[A L/R IN] and/or [A IN 1/2].
 2. For decoding, connect the signal outputs to [D OUT 1/2]/[A OUT IN] and or [A OUT 1/2].
 3. Connect a network patch cable to [Ctrl] and to your existing network.
 4. Connect network patch cables to [Data] and to your existing network.
 5. For clock synchronization, connect the 1 PPS signal to [1 PPS].
 6. If applicable, connect the antenna signal to [RF].
 7. If applicable, connect the signal for the expansion modules to [X].
 8. For serial RS232C data communication, connect a serial breakout cable to [DTE 1/2].
 9. For GPIO communication, connect a serial cable to [GPIO].
 10. Use the headphone output for monitoring the input/output audio signals.
- ✓ You have connected the signals. Continue with connecting the power supply.

4.4 Connecting the Power Supply

NOTICE Risk of equipment damage!

- Make sure that the device and the contained cords are compatible to the domestic line voltage and frequency!

Optionally, the device comes with 2 exchangeable plug-in power supply units which can be equipped with different redundant power supply connectors: either IEC sockets or Neutrik powerCON sockets.



If the device is equipped with a primary and a secondary power supply, then the primary power supply is used. If the primary power supply fails, then the device promptly switches to the secondary power supply and the status changes immediately on the **Device** status page. If the secondary power supply fails, then the device does not need to switch the power supply source and it takes at least 1 minute for the status to update on the **Device** status page.



If the device is equipped with hot-pluggable power supplies, both power supply cassettes must be installed and used during operation. Operating the device with only one cassette may result in improper cooling, reduced mechanical integrity, and compromised overall system reliability.

IEC socket



IEC socket: 230 V AC, 90-260 V AC, 47-63 Hz

- Connect the power supply cord fully to the IEC socket at the back panel of the device and to an independent mains power outlet.
- ✓ You have connected the power supply to the device. The [Power] LED is green if both power supply cords are connected. The [Power] LED flashes green/red if only one power supply cord is connected.

Neutrik powerCON socket

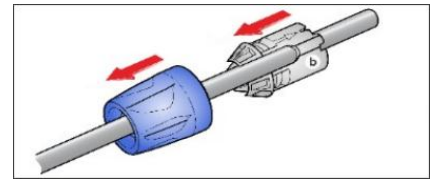


48 V DC Neutrik powerCON socket with aut. switchover (NAC3MPA 1) and Neutrik powerCON connector (NAC3FCA)

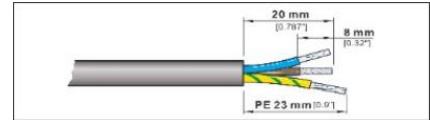
NOTE: The corresponding power cords are not part of the delivery contents!

To prepare and connect the Neutrik powercon connector:

1. Slide the clamping sleeve and collet onto the cable.



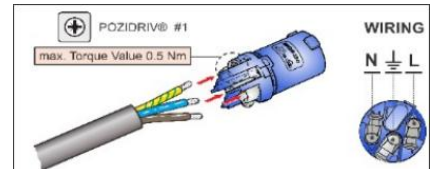
2. Remove part of the insulation.



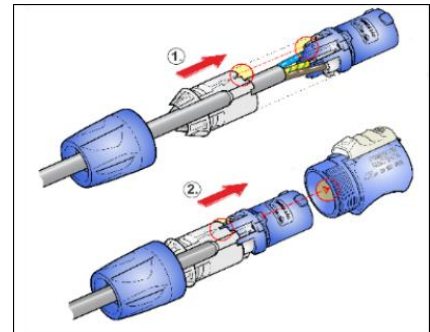
3. Insert the wires into the clamping holes on the inset and fasten them with screw and clamping plate using a screwdriver.



If you use the voltage of +48 V and 0 V, fasten the +48 V wire to L in the connector.
If you use the voltage of 0 V and -48 V, fasten the 0 V wire to L in the connector.



4. Push the inset and collet into the housing (observe guide ribs and guide slot).



5. Tighten the clamping sleeve with a wrench.
 6. Connect the power supply cord fully to the powerCON socket at the back panel of the device and to an independent mains power outlet.
- ✓ You have connected the power supply to the device. The [Power] LED is green if both power supply cords are connected. The [Power] LED flashes green/red if only one power supply cord is connected.

4.5 Configuring the Network

NOTICE False connection of the Ethernet interfaces will lead to incorrect operation!

- Use the [Data] interfaces only for data transfer.
- Use the [Ctrl] interface only for the access to the device via the web interface and for SNMP.
To change the supported services per interface, see 9.1 Configuring the Interface Services.

To transfer data over IP and access the device via the web interface, you must connect the device to your IP network.

For the [Ctrl] interface, DHCP is enabled by default. When you connect the device to your DHCP-enabled network, it will automatically get the IP configuration for the [Ctrl] interface.

To view the obtained IP address, turn the jog wheel to the left to see the “System Info” display. Here you will find the obtained IP address and further system information.

To connect the device to your IP network and change the IP setup via the LCD menu:

1. Push the jog wheel to enter the configuration menu.
 2. Turn the jog wheel to focus the **Network** tab and push the jog wheel.
 3. Push the jog wheel to enter the menu for the [Ctrl] interface.
 4. Configure the settings for your existing IP network (IP address, netmask, gateway etc.). Consult the responsible network administrator if applicable.
 5. Turn the jog wheel until the **Save** menu item is selected and push the jog wheel.
 6. In the dialog window, select **Yes** to save the settings and restart the device.
- ✓ The device is now connected to the IP network.

4.6 Accessing the Web Interface

The device can be fully operated via the integrated web interface using an internet browser. For this purpose, use a computer that is connected to the same IP network that the device is connected to.

Requirement: You have already connected the [Ctrl] interface to the network.

1. Access the web interface by entering the IP address of the device into a web browser.
 - A login screen appears.
 2. Enter the username and password.
- ✓ The main page of the web interface appears.

The default login data (case sensitive) are:

- For read-only access: **user / user**
- For full access: **manager / manager** or **admin / admin**



Change the login data as soon as possible to avoid unauthorized access to the MPX-1g and document the login data in a safe place.

4.7 General Operation

4.7.1 Operation via web interface

The MPX-1g has an integrated web interface. You can make all configurations and operations using a web browser.

Note the following rules when operating the device via web interface:

- If you want to keep any changes made in the configuration of the device, click the corresponding **Save** button.

The changes in each block must be saved individually. If you change data in several blocks or tabs, click the **Save** button under each block to save all changed data. Otherwise, any unsaved block will be reset to the previously saved status when leaving the page.
- If you do not want to keep the changes, reload the page or leave the page without saving.
- Use a decimal point as the decimal separator in numbers in the input fields (i.e. “6.5” for “six and a half”).

4.7.2 Operation via LCD menu

Some basic functions of the device can be operated via the LCD menu and jog wheel.

The display has 2 main menus:

- Status menu (turn jog wheel left or right)
- Configuration menu (push jog wheel)

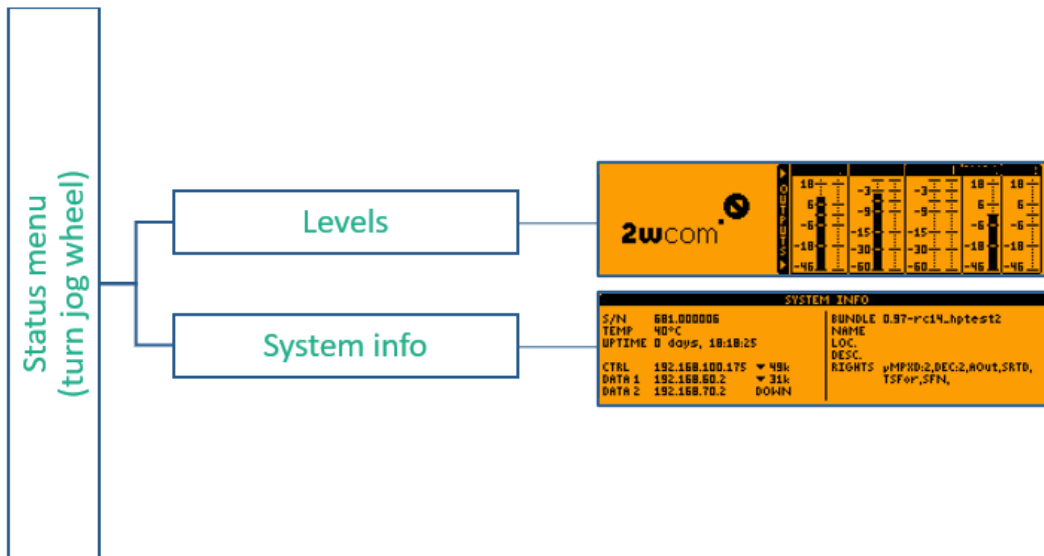
After a warm or cold start of the device, the display shows the default screen of the status menu.

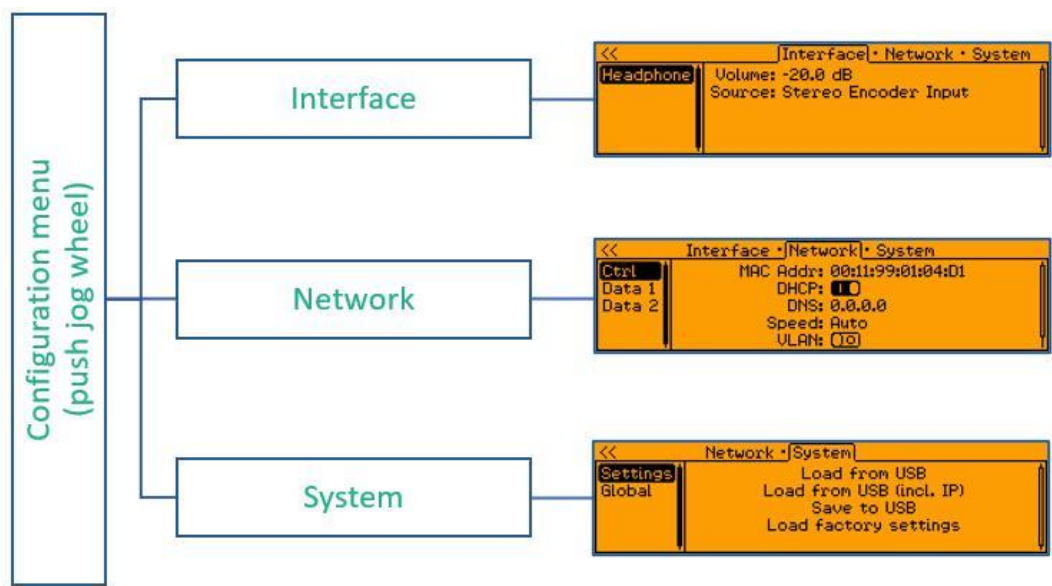
When you navigate in the LCD menu, the display returns to the Status Overview after few minutes of inactivity.

Note the following when operating the device via the LCD menu:

- To switch from the status menu to the configuration menu, push jog wheel.
- To move the focus in the menu structure, turn jog wheel.
- To open a menu tab, focus the tab and push jog wheel.
- To select a configurable menu entry, focus the entry and push jog wheel.
- To configure the selected menu entry, turn jog wheel.
- To confirm changes in a menu entry, push jog wheel.
- To return to the previous menu level, select <<.

Navigation structure





5 RDS Settings

5.1 Setting up the RDS Encoder

The MPX-1g provides an internal RDS encoder that generates an RDS signal and adds it to the generated MPX signal. To set up the RDS encoder, you must first configure at least 1 dataset and then configure the general RDS encoder settings.

Within a dataset, you can configure the following:

- Group settings with Groups sequences and variant code sequences
- Radiotext settings
- Scrolling PS settings
- Slow labeling codes
- Program services (PSNs)

Within the general RDS encoder settings, you can configure the following:

- General settings for the signal and connection
- ODA settings
- Site and encoder addresses
- Inhouse channels
- Timers for automatically turning on and off specific functions
- Settings for automation of radiotext and scrolling PS via UECP commands

5.1.1 Configuring Datasets

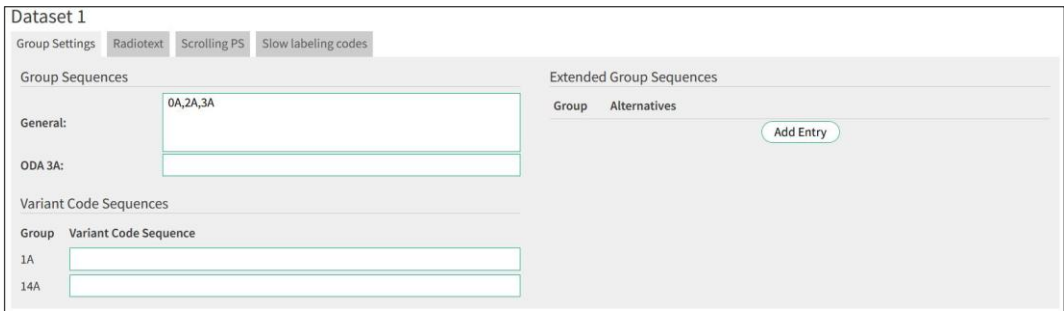
To set up the RDS encoder, you must first configure an RDS dataset. A dataset (DSN) contains almost all the code settings relevant for RDS signal generation including group settings, radiotext, scrolling PS, and slow labeling codes. The structure of the datasets is in compliance with the RDS UECP specification V6.02.

To configure a dataset:

1. Navigate to the **RDS Encoder** page.
 2. Select one of the dataset tabs (DSN 1-16).
 3. Configure the parameters for group settings, radiotext, scrolling PS, and slow labeling codes as described below.
 4. Configure the parameters of the program services (PSNs) as described below.
 5. Select **Save**.
- ✓ You have configured the dataset. Continue with configuring the general RDS encoder settings.

Group Settings

The **Group Settings** section allows you to define the structure and content of the RDS group sequences generated by the RDS encoder.



General

General group sequence: Enter the RDS group sequence of the encoder (comma-separated list, e.g. 0A,2A,3A). The sequences will be transmitted in this order. Only groups that are listed in the group sequence will be transmitted. The groups 4A, 14B and 15B are exceptions. These are transmitted automatically if data arise and do not need to be entered in the group sequence.

ODA 3A

Enter the ODA 3A group sequence as a comma-separated list.

Extended Group Sequences

Add entries for alternative group sequences. Alternative group sequences can be used for specific scenarios or purposes, providing flexibility in adapting the RDS signal to different broadcasting needs.

Variant Code Sequences Enter variant code sequences of the groups 1A and 14A.

Radiotext

The **Radiotext** section allows you to include textual information within the RDS signal, enhancing the listener's experience by displaying relevant details on their radio display.

Select **Create Radiotext** to add the first entry. You can add up to 8 radiotexts per dataset. Drag the arrow (↑) to change the order of the radio texts.



Transmissions

Set the number of transmissions or select **Forever** for continuous display.

Radiotext

Enter the radiotext in this field. The text can contain up to 64 characters.

Count

This field shows the number of characters in the radiotext.

Scrolling PS

The Program Service Name (PS) in RDS is a static 8-character text field used to identify radio stations by name. The scrolling PS function enables stations to display longer PS names by scrolling through a continuous string of characters. This feature is also handy for radios without radiotext support to display information other than the station name. If the text is 8 characters or shorter, scrolling PS is automatically deactivated.

You can choose between 2 modes for scrolling PS that determine the way the PS is moved (example text: "Vancouver 21 Radio Station West Ave"):

- **Standard:** PS is moved by the same number of characters at each interval. Using the example above, with two characters per step and an interval of 1 second: The PS starts with "Vancouve" at 0 seconds, changes to "ncouver" at 1 second, to "ouver 21" at 2 seconds and so forth.
- **Smart:** If possible, the PS is moved word by word in each interval. You can set the size of a piece into which a word is split if it is longer than 8 characters.
The following rules apply to smart scrolling (example text: "Vancouver 21 Radio Station West Ave"):
 - The last piece of a split word is filled with spaces, even if the next word would fit within the 8-character limit ("uver" instead of "uver 21").
 - If two or more unsplit words fit into an 8-character string, they are output simultaneously in the next interval, ("21 Radio" or "West Ave").
 - To represent two words that should be interpreted as one, use an underscore instead of a space ("Now On_Air" will be displayed with "Now" in one interval and "On Air" in the next, instead of "Now On" and "Air"). Underscores are not visible on displays because they are not supported. If two or more words connected by underscores exceed 8 characters, they are split according to the second rule.

Dataset 1

Group Settings Radiotext Scrolling PS Slow labeling codes

General

Scrolling PS Mode: Active: Simple - advances n characters per update

Update interval: 100 ms

Scrolling

Characters: 2 Number of characters to advance per update

Source

Text Source: Separate Text

Separate Text (max. 160 characters): Vancouver 21 Radio Station West Ave Count: 35

Duration [sec]: 0

Scrolling PS Mode Select the scrolling PS mode: Standard or Smart.

Update Interval [ms] Set the frequency at which the displayed text is updated.

Characters In Standard mode, the **Characters** setting determines the number of characters that the Scrolling PS function moves at each interval. In Smart mode, it determines how a word is split if it is longer than 8 characters.

Center words In Smart mode, the words can be centered on the display.

Text Source Select the text source. The text for Scrolling PS is derived either from radio text or from a separate text.

Separate Text If you selected the separate text as the text source, enter the text into this field.

Duration Set the duration for which the separate text is displayed instead of the standard PS. Make sure that the duration is long enough for the whole text to scroll through at least once.

Slow Labeling Codes

The **Slow Labeling Codes** section allows you to configure various codes to convey specific information within the RDS signal.

Dataset 1

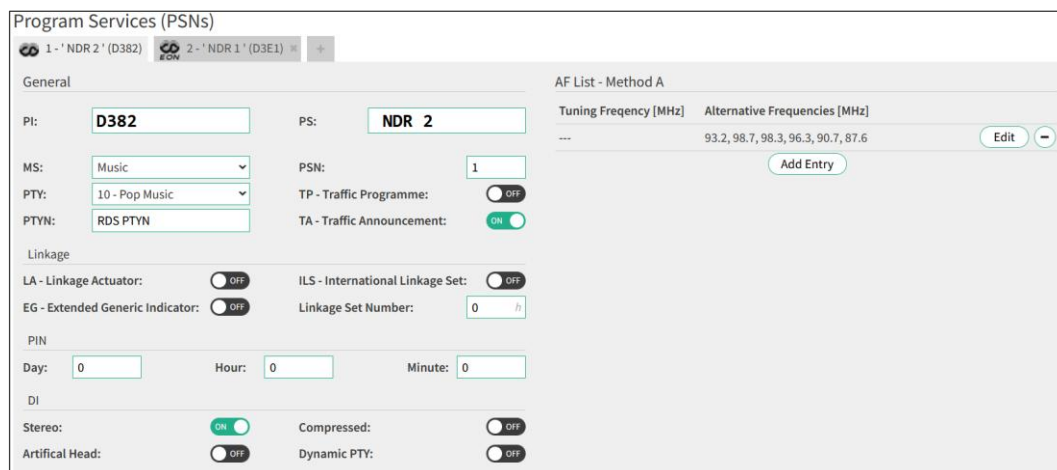
Group Settings Radiotext Scrolling PS Slow labeling codes

Variant Code	Description	Data [hex]	Variant Code	Description	Data [hex]	Variant Code	Description	Data [hex]
0	Paging / Extended Country Code:	E0	3	Language Code:	08	6	Inhouse:	0
1	TMC Identification:	0	4	Not assigned:	0	7	EWS Identification:	0
2	Paging Identification:	0	5	Not assigned:	0			

Paging / Extended Country Code	RDS uses its own country codes. The first most significant bits of the PI code carry the RDS country code. The four-bit coding structure only permits the definition of 15 different codes, 1 to F (hex). Since there are many more countries to be identified, some countries have to share the same code which does not permit unique identification. Hence there is the need to use the extended country code. The extended country codes are defined in the RDS standard.
TMC Identification	The Traffic Message Channel is used for road information. TMC system information is specified by the CEN standard ENV 12313-1. This identification is not required if ODA is used for coding TMC.
Paging Identification	The Paging Identification is defined in the RDS Standard.
Language Code	The language code is used to indicate the spoken language that is currently transmitted. Language codes are defined in the RDS Standard.
Not assigned	Not assigned.
Inhouse	Data reserved for internal management of broadcaster. The coding of this information may be decided unilaterally by the broadcaster to suit the application.
EWS Identification	This data identifies channels used for emergencies or alert transmissions.

Program Services (PSN)

You can configure up to 32 PSNs. The first tab **PSN 1** is the main PSN of the dataset that contains RDS data of the station. The additional PSNs are for the EON feature (enhanced other network). The EON feature is used for large broadcast networks with several different programs. EON enables the transmission of information about other programs, in addition to the normal RDS data. This is useful, for example, if a station does not offer traffic program. RDS tuners can use the traffic program of other stations by temporarily switching to the other station during traffic announcements.



PI	Enter the PI code (hex). The program identification code is used for the identification of the transmitted content. Every program has a specific PI code. It enables the RDS tuner to distinguish between different countries and areas with the same program.
PS	Enter the program station name (up to 8 characters). You can use the scrolling PS or radiotext function if you want to display text that is longer than 8 characters.
PSN	Enter the PSN.
MS	The Music/Speech switch is used to identify whether a music or speech program is transmitted.
PTY	Select the program type from the dropdown menu.
PTYN	Enter a PTYN for a detailed description of the PTY with up to 8 characters. Example: If the PTY is 4 (Sport), a PTYN like "Cycling" could be transmitted.

TP	Activate if the program itself provides traffic announcements. Deactivate if the program relies on the traffic announcements of an EON PSN.
TA	Activate during a traffic announcement made on this program. Always keep activated if the program relies on the traffic announcements of an EON PSN. The program will automatically switch to the EON PSN when the TA switch is activated there, and it will automatically switch back if the TA switch of the EON PSN is deactivated.
Linkage	Configure the LA (Linkage Actuator), EG (Extended Generic Indicator), ILS (International Linkage Set) and the LSN (Linkage Set Number). Linkage information provides the means by which several program services, each characterized by its own PI code, may be treated by a receiver as a single service during times a common program is carried.
PIN	Configure the PIN (program item number) that identifies the scheduled broadcasting time of a specific program. It enables an RDS receiver to work on specified programs only. This function can be used to plan recordings on scheduled broadcasts.
DI	Configure the DI (decoder identification) that identifies different operating modes. This enables controlling of individual decoders. Additionally, it indicates if static or dynamic PTY codes are transmitted.
AF List	Alternative frequency lists are used for sending frequencies that transmit the same program. The RDS tuner starts to tune to one of the alternative frequencies if the current frequency delivers a weak signal. Ideally, the AF list should only comprise frequencies of neighboring transmitters or repeaters. Two methods of transmitting AFs are possible: • Method A: The list only contains the alternative frequencies. If repeaters are used, the list also contains the transmitting frequency itself. A list can contain up to 25 frequencies. • Method B: This method is used where the number of AFs used by a transmitter and its associated repeater stations exceed 25, or where it is required to indicate frequencies which belong to different regions which at times carry different programs. If the number of AFs of a station is larger than 12, the list must be split into two or more lists.

5.1.2 Configuring General RDS Encoder Settings

To configure the general RDS encoder settings:

- Prerequisite: You have already configured at least 1 dataset.
1. Navigate to the **RDS Encoder** page.
 2. Select the **General** tab.
 3. Configure the general settings.
 4. If needed, configure the ODA settings, encoder and site addresses, in-house channels, timers, and automation settings as described below.
 5. Select **Save** after configuring each tab.
- ✓ The RDS signal is now being generated and added to the encoded MPX signal. See also: 7 Codec Settings.

Settings

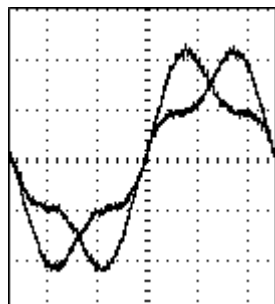
In the settings tab, you can configure general settings for the RDS encoder that concern the signal, the synchronization, and the connection to the RDS Lab software.

RDS Encoder

- Enable** Activate this switch to create an RDS signal.
 Note: Enabling the RDS encoder switches the RDS signal source of the stereo encoder to the internal one.
- Transmit TC (4A)** To transmit a CT signal, activate this switch.
- Active dataset (DSN)** Select a dataset (DSN) from the dropdown menu.

RDS Signal

- Level** Set the level of the RDS signal.
- Phase offset** If the measured waveform does not match the figure below, you can correct it here. The phase position can be adjusted between -180.0° and $+180.0^\circ$. It should result in a symmetrical waveform with two peaks of equal amplitude of RDS and pilot tone.
Note: The waveform depends on the voltage ratio between RDS and pilot signal.



External Synchronization

- Enable** The MPX-1g uses internal 19 kHz synchronization with its own stereo encoder. If the MPX-1g has an external MPX signal source available, the RDS encoder can synchronize to the pilot signal carrier of the MPX signal. **Note:** Activating the external synchronization deactivates the stereo encoder.
 To synchronize the RDS encoder with an external 19 kHz pilot tone, activate the switch.
- Ext. sync source (pilot)** Select an MPX signal source for external synchronization in the dropdown menu "Sync Input (MPX/Pilot)": a connected BNC or XLR input.
- Passthrough (bypass mode)** To output the external MPX from the selected source, activate the MPX bypass.
- Remove ext. RDS signal (filter)** If the external MPX already includes an RDS signal, it must be removed. To replace the external RDS signal with the newly generated one, activate the switch.

RDS Lab

- Enable** Enable data communication between the device and the external 2wcom decoder program "RDS Lab".
- Port settings** Select the [Data] interface and the port number for the data communication.



The parameters which affect the output signal are stored non-volatilely in an EEPROM and are thus retained even after a cold start. On delivery, the following values are usually set in the encoder:

- Reference Table: 1
- RDS Pilot Phase: 0°
- RDS Level: 219 mVpp
- RDS: True (RDS on)

ODA

To use RDS for unspecified applications, you can use open data applications. Using ODA groups, any data can be fed to the application. They use the Free Format Buffers that are already available in the encoder. The data is sent to the encoder via UECP commands and saved in the corresponding transmit queues along with all necessary additional information. The information saved in the transmit queues is later transmitted via the corresponding ODA groups. To preserve the flexibility of the ODA applications, the specification of the currently sent ODA applications can be done while "On Air". For this purpose, the RDS receivers are provided with the necessary additional information with the group 3A.

In the ODA tab, you can add application IDs and configure the parameters for the AID list, spinning wheel, and burst mode.

AID	AID is a unique hex value assigned to each application within the RDS system. It serves as an address through which applications are identified and addressed. Subsequently, this AID can be assigned to a group, through which the actual data transmission then takes place. Through the 3A group, receivers are informed about which AID corresponds to which group, enabling them to assign and forward data accordingly.
Spinning wheel	Spinning wheel mode allows for selective data transmission of a chosen application during specific time intervals. Time intervals within a minute can be designated for either data transmission or no transmission. A minute can be divided into multiple time slots with defined durations for each application. Furthermore, it is possible to specify an offset between the beginning of a minute and the first time slot.
Burst mode	Burst mode enables the transmission of group data in bursts. It allows for consecutive transmission of multiple group data regardless of the default group sequence. You can specify parameters such as the frequency of consecutive transmissions and the minimum number of other groups to transmit between bursts.

Addresses

Site and coder addresses are used to send commands to specific coders or all coders that belong to a site. You can set up to 1024 site addresses and 64 coder addresses.

Site addresses	Format: MEC 17/23 (site address) The individual addresses are each sent as separate UECP frames. The final list sent is a list with the address 0x000 (general address, valid for each encoder).
Coder addresses	Format: MEC 17/27 (encoder address) The last address in the list is always the address 0x00, which is defined for all encoders. If there is no other address, only the address 0x00 is sent.

Inhouse

Internal data, such as identification of the transmission source or remote switching of the networks, can be defined so that they are decoded only within the broadcasting company. For this purpose, you can set in-house channels 0-31.

- Enter the data in the fields **Block 3** and **Block 4** separately for each channel. The entered data are automatically displayed as ASCII characters in the **Block 3/4 as ASCII** filed.

Timer

With the timer function, you can set certain encoder functions on specific days of the week or at specific times.

Enabled	Activate or deactivate the timer function.
Day/Hour/Minute	Select the day of the week and set the specific time.
Function/Parameter	Select the action that is to be carried out.

Automation

With the automation function, you can generate radiotext or scrolling PS using automated strings of text. The strings can be set by an extern program that uses automation commands and communicates with the device via the serial RS232 interface.

Radiotext automation	To use the automated text as radiotext, enable the switch. Set the delay time to keep new information from mixing with old information when the text is being updated.
Scrolling PS automation	To use the automated text as scrolling PS, enable the switch. Set the delay time to keep new information from mixing with old information when the text is being updated.
Current automation data	These fields show the current automation data and their duration. You can manually change the contents of these fields.
Alternative commands	If your automation system uses different automation commands than the given ones, you can replace the given commands with alternative ones.
Format	Set up the format of the automated text.

5.2 UECP Settings

You can decide which interfaces and IP ports can be used for the RDS encoder. You can also decide which MECs are accepted at each interface or port.

To configure the UECP settings:

1. Navigate to the page **UECP Settings** in the section **RDS**.
 2. In the block **Used for RDS Encoder** in the tab **Source Settings**, enable the interfaces and ports that can be used for the RDS encoder.
 3. For each enabled interface or port select a mode from the drop-down menu.
 4. In the block **IP Ports**, specify the parameters for each enabled port.
 5. In the tab **MEC Access Rights**, select the MECs that are to be accepted at each individual interface and port.
 6. Select **Save**.
- ✓ You have configured the UECP settings. View the UECP status page and the UECP log to get an overview of the UECP data.

Parameters

Eanble	Toggle the switch to enable the selected interface or port.
Mode (Used for RDS Encoder)	Select a mode from the drop-down menu. Choose standard mode or set a specific interface or port as a backup for another interface or port.
Mode (IP Ports)	Select a mode from the drop-down menu. Choose between Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).
Interface	Select the interface to be used.
Port	Enter the port number.
Multicast	Toggle the switch to enable multicast.
Multicast IP	Enter the multicast IP.

6 Stereo Settings

6.1 Configuring the Stereo Encoder

The MPX-1g is equipped with a stereo encoder that generates an MPX signal. You can either use external RDS data or the data generated by the internal RDS encoder of the MPX-1g.

If the *MPX limiter* right is activated, you can also limit the peaks and the power of the MPX signal to ensure that the signal being broadcast remains within the permissible limits.

To configure the stereo encoder:

- **Prerequisite:** You have already configured the RDS encoder or you have already connected an external RDS signal to the MPX-1g.

1. Navigate to the **Stereo Encoder** page.
2. In the Settings block, enable the stereo encoder and configure the parameters:

Audio Source	Select an available signal source for the stereo encoder. Possible input sources are analog, digital and decoder audio (decoder right needed).
Stereo Mode	ON: stereo mode with left and right channel OFF: mono mode, stereo content is not generated
Preemphasis	Select the preemphasis. 0 μ s: Preemphasis disabled 50 μ s: Preemphasis active with a time constant of 50 μ s (Europe) 75 μ s: Preemphasis active with a time constant of 75 μ s (North America)
Phase Offset	Manually configure the phase offset of the pilot tone. Enter a value between -5.0° and $+5.0^\circ$ (phase in relation to the 38 kHz signal).

3. To use the RDS data of an external signal, enable the switch in the **External RDS Mode** block. Select the input source for the external RDS signal.
Note: Enabling the external RDS mode will disable the internal RDS Encoder! To use the internally generated RDS signal, keep the external RDS mode disabled.
 4. In the block **Pilot Tone**, enable the generation of a pilot tone and set the level of the pilot tone from 200 to 1000 mVpp.
Note: In external RDS mode, you cannot disable the pilot tone.
 5. In the **MPX Limiter** block, set the thresholds for the peak limiter and the power limiter.
 6. Select **Save**.
- ✓ You have configured the stereo encoder.

6.1.1 Configuring the Sine Generator

One of the available audio sources for the stereo encoder is the Sine Generator. The Sine Generator generates one or two tones (left and/or right) to perform a sound test.

To configure the Sine Generator:

1. Navigate to the page **Stereo Encoder**.
 2. In the block **Settings** select the Sine Generator as the audio source.
 - The block **Sine Generator Settings** appears.
 3. Configure the parameters for the left and right channel separately.
 4. Click **Save**.
- ✓ You have configured the Sinus Generator.

Parameters

Enable	Toggle the switch to enable the sine generator.
Frequency	Choose a frequency in kHz.
Level	Choose a level in dBFS.
Phase	Choose a phase from 0 to 315.

Sine Generator Settings

Left Channel	Right Channel
Enable: ☒	Enable: ☒
Frequency: 1.0 kHz	Frequency: 1.0 kHz
Level: -9.0 dBFS	Level: -9.0 dBFS
Phase: 0 °	Phase: 0 °

6.2 Configuring the Stereo Decoder

The MPX-1g is equipped with a stereo decoder. The decoder can receive MPX signals from different sources.



The stereo decoder can only be used to review MPX signals.

To configure the stereo decoder:

- 1. Navigate to the page **Stereo Decoder**.
 - 2. In the block **Settings**, configure the parameters.
 - 3. Click **Save**.
- ✓ You have configured the stereo decoder. The audio signal is available via Live Listening.

Parameters

Source	Select an available signal source for the stereo decoder. Possible sources are BNC 1, Audio/MPX Decoder, BNC 2, Internal MPX and Digital XLR 2.
Deemphasis	Select the deemphasis. 0 μ s: Deemphasis disabled. 50 μ s: Deemphasis active with a time constant of 50 μ s (Europe). 75 μ s: Deemphasis active with a time constant of 75 μ s (North America).

Stereo

↳ Decoder

Settings

Source:	BNC 1
Deemphasis:	50<math>\mu</math>s

Save

7 Codec Settings

7.1 Creating Codec Profiles

You can create codec profiles to assign to the different encoders of the MPX-1g.

1. Navigate to the page **Codec**.
 2. Click on the tab **Profiles**.
 3. To create a new codec profile, click .
 4. To set up the new codec profile, click **Edit**.
 - A dialog window opens.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created and edited a codec profile.

Parameters

Name	Assign a name to the codec profile for better reference.
Encoder format	Select the encoder format. Different settings are configurable depending on the selected encoder format.
Frame size	Select the required frame size.
Audio mode	Select the audio mode in the dropdown menu.
Sampling rate	Set up sampling rate in the dropdown menu. The sampling rate for Livewire can only be configured for 48 kHz. For some 2wcom devices, the sampling rate is set to 192 kHz.
Sampling width	Set up sampling width in the dropdown menu in the range of 16-24 bits depending on the selected encoder format.
Endianness	Select the endianness (order of bytes).
Bitrate	Select the bit rate in the dropdown menu depending on the chosen audio mode. For some encoder formats, this field shows the calculated bitrate depending on the selected settings.
Used codec version	Select the codec version used for μ MPX based on compatibility and feature requirements.
Keyframe interval	Set the frequency at which keyframes are inserted into the encoded audio stream.
Encryption mode	Select the encryption mode. Off: Select this if the μ MPX signal should not be encrypted. Password: Enter a password to protect the stream. Hash: Enter a hash value to protect the stream.
GPIO Tunneling	Enable GPIO tunneling for GPIO switch between encoder and decoder.

7.2 Input Source Settings

7.2.1 Creating input source configurations for TS/SAT

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 TS/SAT	TS/SAT – Transport stream over satellite (Prerequisite: Sat Tuner right)	[RF Sat]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
 7. Create a demux configuration that uses this input source configuration as a source.
For more information see 7.2.4 Creating demux configurations.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Enter the name of the stream for better reference.
RF input	Select the RF input to be used.
DVB standard	Select the DVB standard.
Modulation	Select the modulation type of the signal to be received.
Frequency input method	Choose whether you want to enter the L-Band frequency or the transponder frequency and LNB data. The transponder frequency will be automatically translated into the corresponding L-Band frequency.
L-Band Frequency	Enter the L-Band frequency of the channel to be received.
Transponder Frequency	Enter the transponder frequency of the channel to be received. Click LNB Config to enter the LNB information.
Symbol rate	Enter the symbol rate used by the transponder.
Roll-Off	Select the roll-off factor used by the receiver filter.
Polarization	Select either horizontal or vertical polarization used by the transponder.
Frequency Range	22 kHz signal used to tell the LNB via Digital Satellite Equipment Control (DiSEqC) to pass on lower band (22 kHz off) or upper band (22 kHz on) signals.
Pilot Mode	If the standard DBV-S2 is used, then select whether a pilot tone is used or not. If unknown, select Auto .
FEC	Select the FEC settings used by the transponder. If unknown, select Auto . This may result in slightly increased tuning times.
ISI filter (0 = off)	To enable the Input Stream Identifier, enter the number of the desired stream.

PLS code Enter a code for Physical Layer Scrambling.

7.2.2 Creating input source configurations for TS/IP

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 TS/IP	TS/IP – Transport stream over IP using UDP/RTP, Unicast/Multicast (prerequisite: <i>TS Decoder</i> right)	[Data]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
 7. Create a demux configuration that uses this input source configuration as a source.
For more information see 7.2.4 Creating demux configurations.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Enter the name of the stream for better reference.
IP type	Select Unicast/Multicast.
Multicast IP	Enter the IP for Multicast, if selected as IP type.
Port	Sender UDP port (the same as set in the encoder settings for output streaming)
IP interface	Select the interface for the input signal.
Protocol	Select the MPEG2 transport stream encapsulation.
Packet reorder/ dejitter delay	The dejitter buffer for IP transforms the variable delay into a fixed delay. It holds the first packet received for a period of time before it sends it out to the decoder. This time period is necessary for reordering the packets as well as to compensate the jitter and optionally to apply FEC correction and/or to combine it with the second, dual streaming input. Enter the value for this holding period in ms. NOTE: The delay time of the input source must not exceed 200 ms if the sample rate is 192 kHz.
RIST	Enable RIST to recover lost packets by resending them.
FEC Mode	Configure the FEC mode depending on the sample rate and the acceptable value for delay.
FEC column/row port offset	Enter the offset to the main destination port the data should be sent to. For example, if the main port is 5004, the value "2" for FEC column port offset means that the port is then 5006 (5004 + 2). If you do not want to use this offset, enter "0".

Dual streaming If dual streaming is enabled, configure the IP parameters. You can set up the same or different [Data] sources for the Ethernet input.

7.2.3 Creating input source configurations for TS/SRT

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 TS/SRT	TS/SRT – Transport stream over IP using SRT (prerequisite: <i>TS Decoder</i> and <i>SRT Decoder</i> rights)	[Data]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
 7. Create a demux configuration that uses this input source configuration as a source.
For more information see 7.2.4 Creating demux configurations.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Enter the name of the stream for better reference.
Mode	Select whether you want to use SRT in listener or caller mode.
Port	Specify the port number for SRT connection.
IP interface	Select the interface for the input signal.
Latency	Define the time interval for the latency before the MPX-1g starts to decode the signal distributed via SRT protocol.
Maximum reorder tolerance	Enter the maximum number of packets that should be reordered.
Use encryption	If the input stream is protected by AES encryption, enable end-to-end encryption.
Passphrase	Enter the password used to secure the SRT stream.

7.2.4 Creating demux configurations

To use an input source configuration that is TS-based, you must first create a corresponding demux configuration.

1. Navigate to the page **Codec**.
 2. In the block **Input Sources**, select the tab of a TS-based input source.
 3. To create a new demux configuration, click  in the block **Demux Configurations**.
 4. To configure the demux configuration, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created a demux configuration.

Parameters

General

TS source	Select the source for the demultiplexer configuration profile in the dropdown menu.
Configuration mode	Select the configuration mode. • Manual/PID: Enter the specific audio PID and a name for better reference. • Service from list (fixed PID): Refresh the service list. Select the service and audio track. • Service from list (auto PID according to PMT): Refresh the service list. Select the service. This mode is used for services that switch to another audio track at times. In that case, the MPX-1g automatically switches to the new audio PID.
Encapsulation mode	Select an encapsulation mode: Multiprotocol Encapsulation or Packetized Elementary Stream.
Audio sync mode	Select the audio sync mode: Buffer level: synchronization with the rate of the incoming data PCR: synchronization with the PCR PID. This is more precise.

Codec

Decoder type	Predefine the codec type for the decoder by choosing the audio codec or selecting "Automatic" from the dropdown menu.
Buffer [ms]	Enter a value for the audio buffer.
Gain	Set the source-specific gain. This is useful if the level of this source is either higher or lower than the levels of the other sources in the decoder chain (main – backup).

µMPX Settings

Buffer size (µMPX)	Enter the buffer size for µMPX.
Decryption mode	Select the decryption mode. • Off: Select this if the µMPX signal is not encrypted. • Password: Enter the password that is needed for decryption. • Hash: Enter the decryption hash value.

Ancillary Data

Ancillary data decoding	If the input stream of the decoder contains ancillary data, the MPX-1g can forward them to the corresponding outputs. If ancillary data are enabled, private data cannot be enabled.
GPIO tunneling	Enable or disable GPIO tunneling for GPIO switch between encoder and decoder.

Private Data

Private data If private data is enabled, enter the data PID and select the configuration mode from the dropdown menu. If private data are enabled, ancillary data cannot be enabled.

SCTE-35

SCTE-35 decoding Toggle the switch to enable SCTE-35 decoding.

Configuration mode Select a configuration mode from the drop-down menu.

Data PID Enter the data PID.

7.2.5 Creating input source configurations for Elementary Streams (UDP/RTP)

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 Elementary Streams	RTP Elementary stream over IP using Unicast/Multicast	[Data]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

Available Streams

Name Enter the name of the stream for better reference.

IP type Select Unicast/Multicast.

Multicast IP Enter the IP for Multicast, if selected as IP type.

Port Sender UDP port (the same as set in the encoder settings for output streaming)

IP interface Select the interface for the input signal.

Protocol Select the MPEG2 transport stream encapsulation: RTP or UDP.
Note: If RTP is used, make sure to also allow RTP Port+1 in your firewall settings, as this port is used for RTCP.

Packet reorder/ dejitter delay The dejitter buffer for IP transforms the variable delay into a fixed delay. It holds the first packet received for a period of time before it sends it out to the decoder. This time period is necessary for reordering the packets as well as to compensate the jitter and optionally to apply FEC correction and/or to combine it with the second, dual streaming input.
 Enter the value for this holding period in ms.

RIST Enable RIST to recover lost packets by resending them.

FEC mode Configure the FEC mode depending on the sample rate and the acceptable value for delay.

FEC column/row port offset	Enter the offset to the main destination port the data should be sent to. For example, if the main port is 5004, the value "2" for FEC column port offset means that the port is then 5006 (5004+2). If you do not want to use this offset, enter "0".
Dual streaming	If dual streaming is enabled, configure the IP parameters. You can set up the same or different [Data] sources for the ethernet input.
Silence mode	With enabled silence mode empty packets will be inserted in case of missing stream input. This may only be useful in cases where this input source is used as an encoder input. If this setting is enabled, an interruption in the stream input will not result in no encoder output.

Codec

Decoder type	Predefine the codec type for the decoder by choosing the audio codec or selecting "Automatic" from the dropdown menu.
Audio mode	Select the audio mode in the drop-down menu.
Channel offset	
Sampling rate	Select a sampling rate in the drop-down menu.
Sample width	Set up sampling width in the drop-down menu in the range of 16-24 bits depending on the selected encoder format.
Endianness	Select the endianness (order of bytes).
Synchronous Payout/SFN	Enable Synchronous Payout using SFN or enter a buffer size [ms].
Buffer	Enter a value for audio buffer in ms.
Gain	Set the source-specific gain. This is useful if the level of this source is either higher or lower than the levels of the other sources in the decoder chain (main - backup).
Buffer size (µMPX)	Enter the buffer size for µMPX.
Decryption mode	Select the decryption mode. • Off: Select this if the µMPX signal is not encrypted. • Password: Enter the password that is needed for decryption. • Hash: Enter the decryption hash value.

Ancillary Data

Ancillary data decoding	If the input stream of the decoder contains ancillary data, the MPX-1g can forward them to the [DTE] outputs.
GPIO tunneling	Enable GPIO Tunneling for GPIO switch between encoder and decoder.

7.2.6 Creating input source configurations for SRT



This option is only available if the right *SRT Decoder* is enabled.

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
	Elementary stream over IP using SRT (optional: "SRT Decoder" right)	[Data]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Enter the name of the stream for better reference.
Mode	Select whether you want to use SRT in listener or caller mode.
Port	Specify the port number for SRT connection.
IP interface	Select the interface for the input signal.
Latency	Define the time interval for the latency before the MPX-1g starts to decode the signal distributed via SRT protocol.
Maximum reorder tolerance	Enter the maximum number of packets that should be reordered.
Encryption	If the input stream is protected by AES encryption, enable end-to-end encryption.
Passphrase	Enter the password used to secure the SRT stream.

Codec

Decoder profile	Select the codec profile from the dropdown menu.
Buffer	Enter a value for audio buffer in ms.
Gain	Set the source-specific gain. This is useful if the level of this source is either higher or lower than the levels of the other sources in the decoder chain (main - backup).

Ancillary data (Decoder only)

Ancillary data output	If the input stream of the decoder contains ancillary data, the MPX-1g can forward them to the [DTE] outputs.
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7.2.7 Creating input source configurations for Icecast

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 Icecast	Stream over IP using TCP (Icecast/Shoutcast)	[Data]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click **+**.
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Assign a name to the Icecast server for better reference.
URL	Enter the URL of an Icecast server in the local network or the internet, e.g. "192.168.99.131" or "www.backup-audio.com".
Username	Enter the username.
Password	Enter the password.
IP Interface	Select the [Data] interface for the audio stream input.
Buffer	Enter a value for audio buffer.
Gain	Set the source-specific gain. This is useful if the level of this source is either higher or lower than the levels of the other sources in the decoder chain (main – backup).

Ancillary Data

Ancillary data	To add ancillary serial data to the stream, activate the switch.
GPIO tunneling	Enable GPIO tunneling for GPIO switch between encoder and decoder.

7.2.8 Creating input source configurations for HLS



This option is only available if the *HLS decoder* right is enabled.

You can create an input source configuration and use it for decoding.

Input Source	Description	Source Interface
 MPEG DASH / HLS	HTTP Live Streaming (HLS)	[Data]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Assign a name to the configuration profile for better reference.
URL	Enter the URL of the HLS stream.
IP interface	Select the [Data] interface for the audio stream input.
VLAN	If the selected [Data] interface is an interface with VLAN, then select the VLAN to be used.
Gain	Set the source-specific gain. This is useful if the level of this source is either higher or lower than the levels of the other sources in the decoder chain (main - backup).

7.2.9 Creating input source configurations for Radio

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 Radio	Audio over FM or DAB tuner.	[RF]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

RF input	Select the RF input to be used.
Tuner type	Select the tuner type. You can choose between FM, DAB and FM/HD Radio®.
Name	Assign a name to the configuration profile for better reference.
FM Frequency	Enter the frequency of the input signal in MHz.
FM Mode	Select the FM mode. Auto switches between stereo and mono depending on the signal quality.
FM Deemphasis	Select the deemphasis to reverse previously added emphasis on the signal.
DAB channel	Choose a DAB channel from the drop-down menu.
DAB service	Choose a DAB service from the drop-down menu.
HD program	Choose an HD program from the drop-down menu.
HD mode	Choose the HD mode.
Buffer	Enter the buffer time in ms.
Gain	Enter the gain in dB.

Ancillary Data

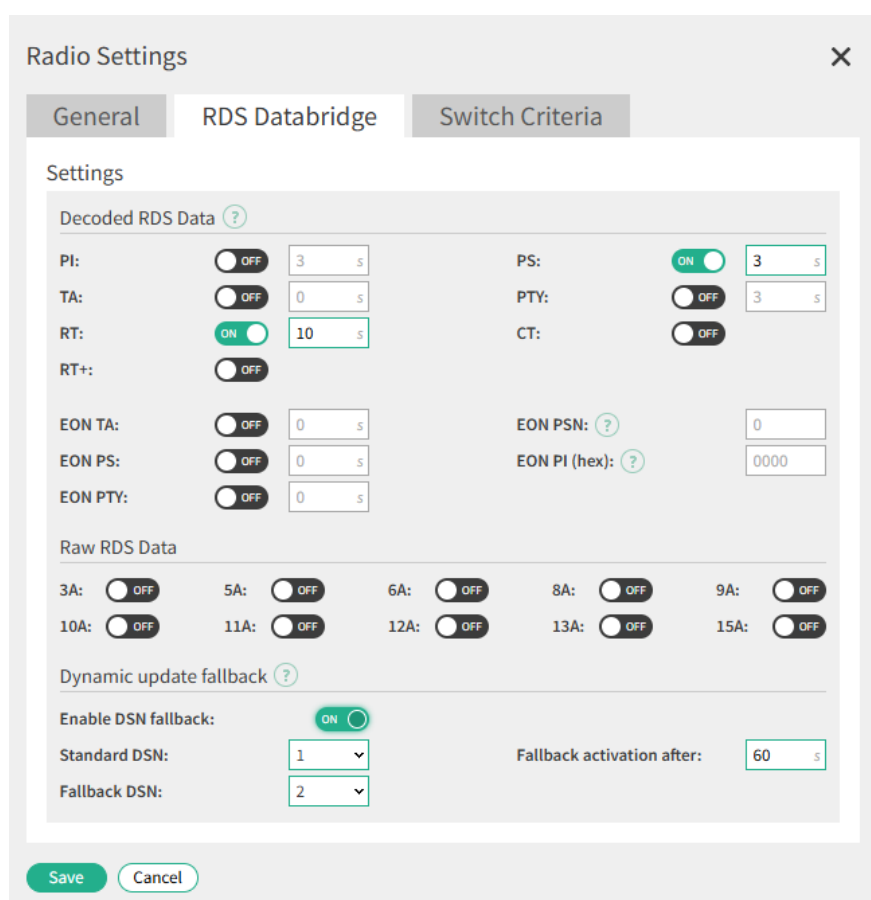
RDS databridge	Toggle the switch to enable the RDS Databridge. Note: The parameters for the RDS databridge can be configured in the separate tab RDS Databridge . For more information see 7.2.9.1 Setting up the RDS databridge.
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7.2.9.1 Setting up the RDS databridge

The RDS databridge can be used to transfer RDS data from the tuner to the MPX-1g.

To enable the RDS databridge:

1. Navigate to the page **Codec**.
 2. In the tab **Input Sources** select the tab **Radio**.
 3. Choose an RF input to add the RDS databridge to.
 4. Click **Edit**.
 5. To enable the RDS databridge toggle the switch in the block **Ancillary Data**.
 - The tab **RDS Databridge** appears.
 6. Configure the parameters in the tab **RDS Databridge**.
 7. Click **Save**.
- ✓ You have enabled and configured the RDS databridge for the selected RF input.



Radio Settings [X]

General | **RDS Databridge** | Switch Criteria

Settings

Decoded RDS Data ?

PI:	☐ OFF	3 s	PS:	☒ ON	3 s
TA:	☐ OFF	0 s	PTY:	☐ OFF	3 s
RT:	☒ ON	10 s	CT:	☐ OFF	
RT+:	☐ OFF				
EON TA:	☐ OFF	0 s	EON PSN: ?		0
EON PS:	☐ OFF	0 s	EON PI (hex): ?		0000
EON PTY:	☐ OFF	0 s			

Raw RDS Data

3A: ☐ OFF	5A: ☐ OFF	6A: ☐ OFF	8A: ☐ OFF	9A: ☐ OFF
10A: ☐ OFF	11A: ☐ OFF	12A: ☐ OFF	13A: ☐ OFF	15A: ☐ OFF

Dynamic update fallback ?

Enable DSN fallback: ☒ ON

Standard DSN: Fallback activation after: s

Fallback DSN:

Save **Cancel**

Parameters

Decoded RDS Data

The RDS databridge can transfer decoded RDS data. To enable the transfer of the decoded RDS data choose the data to be transferred.

To enable the transfer of a specific data type, toggle the switch next to it. You can also set the update frequency for the data type. A value of 0 seconds will transfer the data only when it changes its value. Any other value will result in a cyclic transfer.

PI Program identification

TA	Traffic announcement identification
RT	Radiotext
RT+	Radiotext plus
PS	Program identification
PTY	Program type
CT	Clock time and date
EON	Enhanced Other Networks
EON PSN	EON PSN is needed to address the correct PSN for the EON program.
EON PI (hex)	EON PI is needed to select the correct EON program for cyclic transfers and EON PS/PTY.

Raw RDS Data

The RDS databridge can transfer raw RDS data. To enable the transfer, choose the RDS group to be transferred.

To enable the transfer of the raw RDS data of the selected group, toggle the switch next to the selected RDS group.

Dynamic update fallback

In the event of a failure of the dynamic DSN update the **Dynamic update fallback** function switches from the standard DSN to a Fallback DSN.

To set up the **Dynamic update fallback** configure the parameters below:

Enable DSN fallback	Toggle the switch to enable DSN fallback.
Standard DSN	Select the number of the standard DSN to be used.
Fallback DSN	Select the number of the fallback DSN to be used in case of a failure.
Fallback activation after	Set a time in seconds after which the fallback will be activated.

You can view the status of the RDS data in the section **Status** on the page **UECP** in the tab **Ancillary** (see 11.5 UECP Data Status).

7.2.9.2 DAB to RDS conversion

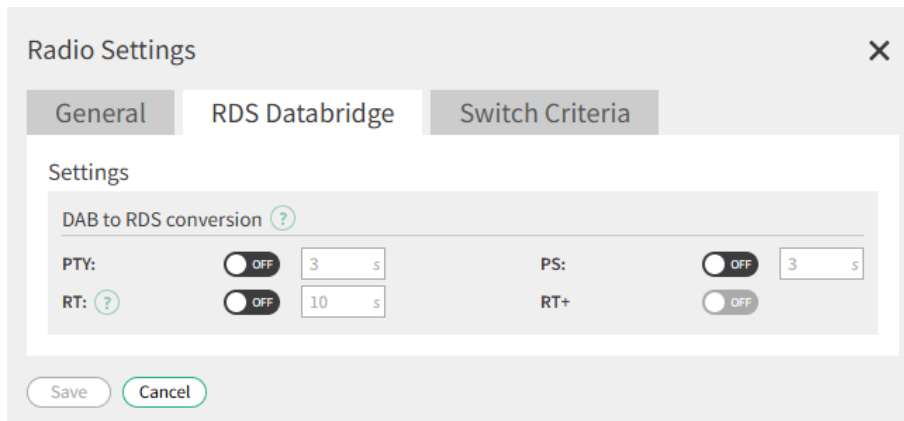
The RDS databridge can also be used to transfer DAB data.

To enable the transfer the DAB data has to be converted to RDS UECP data.

- **Prerequisite:** You have already configured a DAB input source.

To enable the DAB to RDS conversion:

1. Navigate to the page **Codec**.
 2. In the tab **Input Sources** select the tab **Radio**.
 3. Choose a DAB input source to add the RDS databridge to.
 4. Click **Edit**.
 5. To enable the RDS databridge toggle the switch in the block **Ancillary Data**.
 - The tab **RDS Databridge** appears.
 6. Configure the parameters in the tab **RDS Databridge**.
 7. Click **Save**.
- ✓ You have configured the RDS databridge for the DAB to RDS conversion.



The image shows a 'Radio Settings' dialog box with three tabs: 'General', 'RDS Databridge', and 'Switch Criteria'. The 'RDS Databridge' tab is selected. Inside this tab, there is a 'Settings' section with a 'DAB to RDS conversion' header. Below this, there are four settings: 'PTY' with a toggle switch (OFF) and a text input field (3 s); 'PS' with a toggle switch (OFF) and a text input field (3 s); 'RT' with a toggle switch (OFF) and a text input field (10 s); and 'RT+' with a toggle switch (OFF). At the bottom of the dialog are 'Save' and 'Cancel' buttons.

Parameters

To enable the transfer of a specific data type, toggle the switch next to it. You can also set the update frequency for the data type. A value of 0 seconds will transfer the data only when it changes its value. Any other value will result in a cyclic transfer.

Radiotext supports up to 64 characters, DAB Dynamic Label supports up to 128 characters. For the DAB to RDS conversion the radiotext is generated from the DAB Dynamic Label. If the Dynamic Label is longer than 64 characters, it is shortened for the radiotext and ends with "...". Note that the data from the Dynamic Label plus can only be transferred if the data is included in the shortened version of the Dynamic Label.

PTY	DAB Program type
PS	Program identification with the DAB short label
RT	DAB Dynamic Label (shortened if necessary)
RT+	DAB Dynamic Label plus (included if possible)

7.2.10 Creating input source configurations for internal storage (File)

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 File	Files from internal storage	Internal storage (eMMC, optional SSD)

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Assign a name to the configuration profile for better reference.
File	Select an audio file in the dropdown menu.
Buffer	Enter a value for audio buffer.
Gain	Set the source-specific gain. This is useful if the level of this source is either higher or lower than the levels of the other sources in the decoder chain (main - backup).
Play once	If enabled, the file will only be played once.

7.2.11 Creating input source configurations for XLR

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 XLR	Digital (AES/EBU) or analog audio over XLR connector	[D IN] [A IN]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Assign a name to the configuration profile for better reference.
Direct processing	If enabled, the input is processed without an intermediate buffer (Buffer=0).
Buffer	Enter a value for audio buffer in ms.

Ancillary Data (Decoder only)

Ancillary data source	Select the source for ancillary data in the dropdown menu.
-----------------------	--

7.2.12 Creating input source configurations for BNC

You can create an input source configuration and use it for encoding and decoding.

Input Source	Description	Source Interface
 BNC	BNC inputs	[A IN]

To create a new configuration profile for an input source:

1. Navigate to the page **Codec** in the section **Codec Settings**.
 2. In the block **Input Sources**, select the input source for which you want to create a configuration profile.
 3. To create a configuration profile, click .
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have created an input source configuration.

Continue with 7.3 Assigning input source and codec profile to an encoder.

Parameters

General

Name	Assign a name to the configuration profile for better reference.
Direct processing	If enabled, the input is processed without an intermediate buffer (Buffer=0).
Buffer	Enter a value for audio buffer in ms.

Ancillary Data (Decoder only)

Ancillary data input	Select the source for ancillary data input in the dropdown menu.
-----------------------------	--

7.3 Assigning input source and codec profile to an encoder

The MPX-1g is equipped with an encoder.

Prerequisite: You have already created a configuration profile for the input source you want to use.

1. Navigate to the page **Codec**.
 2. Click on the tab **Encoder**.
 3. In the block **Source/Profile Assignment**, assign an input source configuration to the encoder by selecting it in the dropdown menu **Input source**. Alternatively, drag/drop the input source configuration into this field.
Note: You can only choose **Internal MPX** as an input source for the encoder.
 4. Select the source for ancillary data from the dropdown menu **Ancillary Source**. To configure the ancillary data inputs and outputs, see 8.4 Configuring the DTE interface.
 5. Assign a codec profile to the encoder by selecting it from the dropdown menu **Profile**. Alternatively, drag/drop the codec profile into this field.
 6. Click **Save**.
- ✓ You have activated and configured the encoder.

7.4 Setting up encoder outputs

7.4.1 Setting up an Elementary Stream output

You can activate and configure output streams for each encoder.

To set up a converter output:

1. Navigate to the page **Codec**.
 2. In the block **Outputs**, select the tab (if applicable) of the output you want to set up.
 3. Click  to create a new encoder output.
 4. To set up the new output, click **Edit**.
 5. Edit the parameters of the output settings.
 6. Click **Save**.
- ✓ You have set up an encoder output.

Parameters

Activation	To activate this output, set the switch to ON .
Encoder	Select the encoder. The same encoder can be assigned to several outputs.
Name	Enter the name of the stream for better reference.
Domain Name / IP	Define the domain name or IP address of the destination.
Port	Specify the port number of the destination.
QoS DSCP	Select the quality of service (QoS). The selected packet will be prioritized.
Multicast TTL	TTL (Time to Live) for multicast packets.
IP interface	Select the interface for the output.
Mode	Select the mode of the output stream in the dropdown menu: RTP or UDP. NOTE: Besides UDP/RTP, RTCP packets are also generated for the encoder output and are sent in intervals of 5 s. UDP/RTP allows reordering packets by means of sequence numbers.
RTCP output	Enable or disable the Real-Time Control Protocol (RTCP) output for monitoring and control of the stream. Note: If RTP is used, make sure to also allow RTP Port+1 in your firewall settings, as this port is used for RTCP.
Maximum payload size	Select the size limit for the payload. To set no limit, select Maximum .
Send Delay	Set up the send delay, which the encoder should wait in order to send Audio over IP as an offset stream for redundancy
RIST	Enable RIST to recover lost packets by resending them. You can enter a limit for the bandwidth used by the stream including re-sent packets.
Stream4Sure	Enable this function to allow the decoder to use this stream as one of up to 4 IP streams for Stream4Sure.
Synchronous Playout / SFN	Enable SFN and enter the global delay to ensure synchronous playout.
FEC Mode	Configure the FEC mode depending on the sample rate and the acceptable value for delay.
FEC column/row port offset	Enter the offset to the main destination port the data should be sent to. For example, if the main port is 5004, the value "2" for FEC column port offset means that the port is then 5006 (5004 + 2). If you do not want to use this offset, enter "0".

Dual streaming If dual streaming is enabled, configure the IP parameters. You can set up the same or different [Data] sources for the Ethernet input.

7.4.2 Setting up an SRT output

You can activate and configure output streams for each encoder.

To set up a converter output:

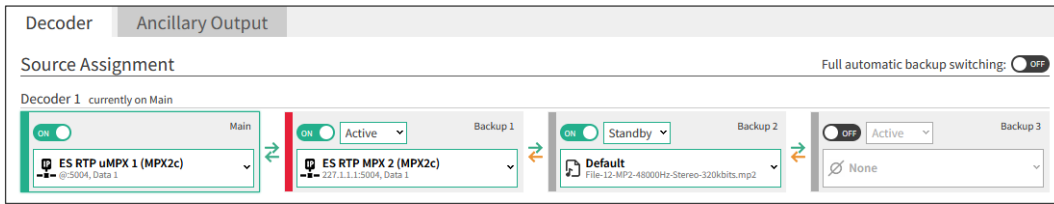
1. Navigate to the page **Codec**.
 2. In the block **Outputs**, select the tab (if applicable) of the output you want to set up.
 3. Click  to create a new encoder output.
 4. To set up the new output, click **Edit**.
 5. Edit the parameters of the output settings.
 6. Click **Save**.
- ✓ You have set up an encoder output.

Parameters

Activation	To activate this output, set the switch to ON .
Encoder	Select the encoder. The same encoder can be assigned to several outputs.
Name	Enter the name of the stream for better reference.
Mode	Choose between "Caller" and "Listener" mode.
Host	Enter the host domain of the SRT destination.
Stream ID	Enter the stream ID.
Auto-configure source port	Activate automatic configuration of the source port.
Source port	If auto-configuration is disabled, enter the source port number manually.
Destination port	Enter the port number of the destination.
IP interface	Select the [data] interface for the output.
Latency	Define the time interval for the latency before the MPX-1g starts to output the SRT stream.
Bandwidth limiting (payload)	Toggle the switch to enable bandwidth limiting and set a value for the limit in kbps.
Encryption	Toggle the switch to enable encryption. The type of AES encryption determines the length of the key (passphrase). AES-182 uses a 16-character passphrase (128 bit), AES-192 uses a 14-character (192 bit) and AES-256 uses a 32-character (256 bit) passphrase.
Passphrase	Define a password used to secure the SRT stream.

7.5 Assigning input sources to a decoder

For each audio output, you can activate up to 4 input sources for decoding and assign one of them to the "Main Source". The remaining sources are alternative backups for decoding. The decoder receives and processes all enabled input sources from the encoder but only outputs the highest-priority audio signal that is error-free. The priorities of the sources are as follows: main source, backup 1, backup 2, backup 3.



Prerequisite: You have already created input source configurations (see 7.2 Input Source Settings).

To assign input sources to a decoder:

1. Navigate to the page **Codec**.
 2. Click on the tab **Decoder**.
 3. Under **Source Assignment**, activate an input signal in the column **Main** by setting the switch to **ON**.
 4. To assign an input source to the main source, select it in the dropdown menu. Alternatively, drag and drop the input source into the field.
 5. Assign up to 3 backup sources following the same principle.
 6. Choose between **Active** or **Standby** mode for your backup sources. This setting determines how the decoder handles these sources.
When a backup source is set to Active mode, the decoder continuously processes it. This ensures that the backup source is readily available for immediate use. It offers quick switching to the backup source when required.
In Standby mode, the decoder still receives the backup source, but it remains in a dormant state, consuming fewer system resources. The decoder will only start processing the standby source when it's needed. While Standby mode conserves resources, it may introduce a slight delay when switching to the standby source due to the initial processing time.
 7. Optionally, disable **Full automatic backup switching** to gain more control over the source switching. Click on the arrows between the sources to prevent a backup from automatically switching back to the input of higher priority, even if it improves in quality. This prevents unwanted back-and-forth switching between unstable sources. The source switching can be configured manually and remotely.
 8. Click **Save**.
- ✓ The decoder now processes the main and backup sources.
Continue with 7.8 Defining Switch Criteria for the main and backup sources.



You can decode and play files from the internal storage. This option is recommended as an advanced redundancy for backup sources in case of input failure.

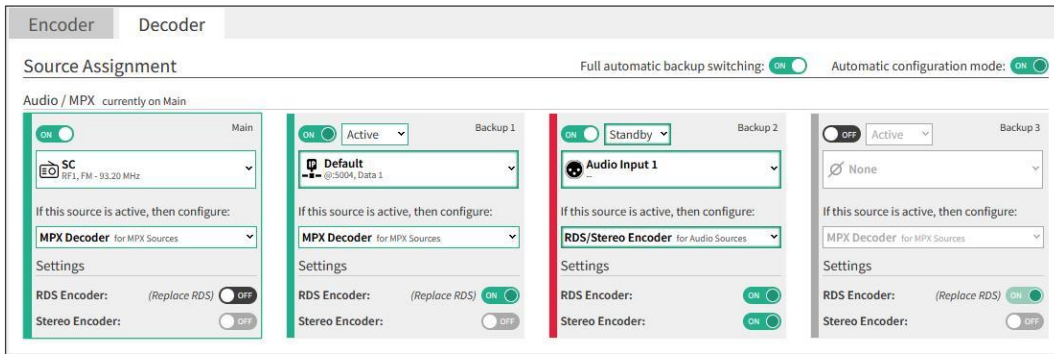


You can use XLR audio inputs as a backup source fed from an external device or for a loopback test.

7.6 Setting up the Automatic Config Mode

The automatic configuration mode is a function that allows you to define the setup of the MPX-1g depending on the type of the currently active input source.

For example, if the main source is an MPX signal, you can set up the device to work as an MPX decoder. If this input source fails and the device switches to the backup source, this backup source could be an audio source. To decode a complete MPX signal, you can set up the device to automatically generate the RDS/stereo signal for this input source.



The screenshot shows the 'Decoder' tab in the 'Codec Settings' window. Under 'Source Assignment', there are four columns for 'Main', 'Backup 1', 'Backup 2', and 'Backup 3'. Each column has a source selection dropdown, a configuration dropdown, and settings for 'RDS Encoder' and 'Stereo Encoder'. The 'Main' source is 'SC RF1, FM - 93.20 MHz' with an 'MPX Decoder' configuration. 'Backup 1' is 'Default 8-5004, Data 1' with an 'MPX Decoder'. 'Backup 2' is 'Audio Input 1' with an 'RDS/Stereo Encoder'. 'Backup 3' is 'None' with an 'MPX Decoder'. At the top right, 'Full automatic backup switching' and 'Automatic configuration mode' are both enabled.

To set up the automatic configuration mode:

- **Prerequisite:** You have already created input source configurations.
 - **Prerequisite:** You have already configured the settings for the stereo encoder and the RDS encoder.
1. Navigate to the **Codec** page.
 2. Under **Decoder**, assign main and backup sources.
 3. Enable the automatic configuration mode.
 4. For each source, select whether the device should be configured as an MPX decoder (for MPX sources) or as an RDS or stereo encoder (for audio sources).
 5. For MPX sources, select whether to replace the RDS signal with internally generated RDS data.
 6. For audio sources, select whether to generate RDS and/or a stereo signal.
 7. Select **Save**.
- ✓ The MPX-1g now changes its configuration depending on the currently active input source. Continue with defining switch criteria for each input source.

7.7 Kantar watermarking

The MPX-1g can detect watermarking which is based on Kantar's SNAP technology. Once the appropriate license agreement has been successfully acquired from Kantar Media and the watermarking detector has been activated, the MPX-1g enables the detection of audio watermarks provided by Kantar Media watermarking detectors.

7.7.1 Obtaining a Kantar watermarking license

The MPX-1g is delivered with the watermarking detector software disabled by default.

To request a license agreement for the watermarking detector software, please contact the Kantar Media Support at: www.kantarmedia.com/watermarkinghelpdesk

Once you have obtained a valid license agreement, you can request the activation right for the watermarking detector from 2wcom Systems GmbH.

For more information on how to activate rights, see 10.8 Activating rights.

7.7.2 Configuring the Kantar Watermarking detector

The Kantar watermarking detection function is available for various input sources. To activate the watermarking detector, configure the watermarking detector for the desired input source.

To configure the Kantar watermarking detector:

1. Navigate to the page **Codec**.
 2. Click on the tab **Input Sources**.
 3. To create a new input source, click **+** or choose an existing one.
 4. To set up the new configuration profile, click **Edit**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have configured the Kantar watermarking detector.

Parameters

- Enable**

Enable to activate the Kantar watermarking detector.
- Content ID**

Enter a Content ID to detect.

Kantar watermarking detector

Enable:

Content id:

ON

1

Save

Cancel

The status of the Kantar watermarking detector is displayed on the overview page under the details of the respective decoder. Information about the detected Content ID, the timestamp, and the respective confidence level is displayed.

Details - Decoder / Audio / MPX					
Main Source		Watermarking		File	
 Default Airshow-Snap.wav	Content ID		Confidence	Date	
	1		100 %	23. Jul 2025, 11:08:52	
Timestamp		Confidence		Size	Position
08.07.2025, 00:00:16		100 %		2.75 MB	00:17
				Length	00:30

You can also set up alarms for the Kantar watermarking detector. For more information on alarms, see 10.18 Setting Up Alarms.

7.8 Defining Switch Criteria

The MPX-1g decoder can automatically switch between alternative sources as a redundancy solution in case of failure. The decoder receives and processes all enabled input sources from the encoder but only outputs the audio signal of the highest priority that is error-free (main source – backup 1/2/3). Additionally to the global switch criteria, you can define switch criteria for individual sources that override the global switch criteria.

You can enable the following switch criteria for input sources. The availability of switch criteria depends on the selected input source.

AES/EBU no signal	The MPX-1g will switch the input source to the next backup source if no signal is detected in the active input.
Alarm receiver	The MPX-1g will switch automatically to the alarm receiver source if an alarm signal is detected.
No decoder input	The MPX-1g will switch to the next input source if the decoder does not receive any data.
No decoder output	The MPX-1g will switch to the next input source if the decoder does not output any data.
No input data	The MPX-1g will switch to the next input source if no signal is available in the activated IP input [Data].
Packet jitter	The MPX-1g will switch to the next input source if the packet jitter exceeds the set value.
Packet loss (PER)	The MPX-1g will switch to the next input source if packet errors are detected in the input signal over the activated IP input [Data].
RF Level	The MPX-1g will switch to the next input source if the frequency is below the set value.
Silence detection	The MPX-1g will switch the input source to the next backup source if silence is detected in the audio signal of the input stream.

To define global switch criteria for each audio input type:

1. Navigate to the page **Switch Criteria**.
 2. Click on the tab of the input source for which you want to define switch criteria.
 3. If any of the listed criteria should be monitored, enable the corresponding switch.
 4. In the field **Value**, enter the threshold above or below which the input source should be switched.
 5. For each enabled criterion, define the delay time **T1** for switching release. After this delay time, the input source switches to the next backup source.
 6. For each enabled criterion, define the delay time **T2** for switching end. After this delay time, the input source switches back to the previous source, if its signal is good.
 7. Click **Save**.
- ✓ The MPX-1g now automatically switches to the next good input source. For some switch criteria, you can set an alarm (see 10.18 Setting Up Alarms).

To define individual switch criteria for a specific input source:

1. Navigate to the page **Codec**.
 2. Click **Edit** on the input source for which you want to define individual switch criteria.
 3. Select the **Switch criteria** tab.
 4. Toggle the switch **Override global switch criteria**.
 5. Define the individual switch criteria.
 6. Click **Save**.
- ✓ The switch criteria for this input source now override the global switch criteria.



On the page **Codec**, the switch criteria scope (SCS) of an input source is indicated with  for global and with  for individual.

7.9 Configuring the Alarm Receiver



This option is only available if the right *Alarm Receiver* is enabled.

The Alarm Receiver is an additional switch criterion that enables the codec to switch to the alarm receiver source if an alarm signal is detected.

Note: The alarm receiver source has to be set as a superior source in relation to the other configured sources on the page **Codec** in the tab **Input Sources**. If the settings of other switch criteria interfere with the settings of the alarm receiver, the source will not be switched.

To enable the Alarm Receiver:

1. Navigate to the page **Switch Criteria**.
 2. To enable the alarm receiver, toggle the switch in the tab **Radio**.
 3. Click **Save**.
- ✓ You have enabled the Alarm Receiver.

After enabling the alarm receiver, you need to configure the alarm receiver. You can click the link *Configuration here* next to the switch **Enable** or follow the instructions below.

The alarm receiver monitors RDS signals, especially PTY. Depending on the mode it is set to, the source will be switched to the alarm receiver source if an alarm signal is detected. For example, if the mode is set to Auto PTY31 the source will be switched to the alarm receiver when an alarm signal with PTY31 is detected. When no alarm signal is detected, the source will be shown as red. If an alarm signal is detected the source will be shown as green.

To configure the Alarm Receiver:

1. Navigate to the page **Alarm Receiver**.
 2. Configure the parameters in the block **Settings**.
 3. Click **Save**.
- ✓ You have configured the Alarm Receiver.

Parameters

Mode	Select a mode to use for the alarm receiver. Available modes are Manual off, Manual alarm, Auto PTY31 and Auto PTY30.
Alarm delay	Enter a time in seconds as a delay before the alarm is triggered.
No alarm delay (timeout reset via PTY)	Enter a time in seconds as a delay before the alarm is deactivated. If the delay is greater than 0 seconds, PTY can be toggled within this time. This resets the timeout and retains the alarm.
Timeout	Enter a timeout in seconds. If the alarm is active longer than this timeout, it is withdrawn even if the alarm conditions are still fulfilled.
RDS sync lost timeout	Enter a timeout in case the RDS sync is lost. If RDS sync is lost longer than this timeout, the alarm is reset if it is active.

You can view the details on the page **Overview** in the tab **Spectrum** under the respective decoder.

Codec Settings
Alarm Receiver

Settings

Mode:	Auto PTY31
Alarm delay [0 ... 5]: ?	1 sec
No alarm delay (timeout reset via PTY) [0 ... 5]: ?	0 sec
Timeout [0 ... 3600]: ?	900 sec
RDS sync lost timeout [0 ... 5]: ?	5 sec

Save

7.10 Configuring network

network is 2wcom's web-based platform for remotely managing broadcast devices. Via the network interface you can manage all devices connected to network, create device groups and schedule tasks. network can be configured for the input sources TS/SAT, TS/IP and TS/SRT.

- **Prerequisite:** You have already set up the network platform via the network interface.
- **Prerequisite:** You have already configured at least one input source for TS/SAT, TS/IP or TS/SRT.

To configure network:

1. Navigate to the page **Codec**.
 2. Select the tab **Input Sources**.
 3. Click **Edit** on the input source for which you want to configure network.
 4. Select the tab **Network**.
 5. Configure the parameters.
 6. Click **Save**.
- ✓ You have configured network for the selected input source.

Parameters

Remote control via Network	Toggle the switch to enable the remote control via network.
Network PID	Enter the network PID to be used.

8 Interface Settings

8.1 Configuring input/output settings

For signal input and output, XLR and BNC interfaces are available. You must manually set the type of the signal input in the web interface to either analog or digital. If the *Audio Output* right is activated, you can also output analog audio.

BNC / XLR / Headphone	
Inputs BNC 1 & 2 BNC 1 Gain [-20.0 ... 6.0]: 2.0 dB BNC 2 Gain [-20.0 ... 6.0]: 2.0 dB XLR 1 & 2 Type: Digital Digital 1 Gain [-20.0 ... 6.0]: 0.0 dB Digital 2 Gain [-20.0 ... 6.0]: 0.0 dB	
Outputs BNC 1 & 2 BNC 1 Gain [-20.0 ... 6.0]: 0.0 dB BNC 2 Gain [-20.0 ... 6.0]: 0.0 dB XLR 1 & 2 Type: Digital Digital 1 Gain [-20.0 ... 6.0]: 0.5 dB Digital 2 Gain [-20.0 ... 6.0]: 0.0 dB	

To configure the signal inputs and outputs:

1. Navigate to the page **BNC / XLR / Headphone**.
 2. For the XLR inputs and outputs, select either analog or digital.
 3. Enter the gain for each input and output.
 4. Click **Save**.
- ✓ You have configured the signal inputs and outputs.

8.2 Setting the Critical Level Marker

The audio level of the inputs and outputs is displayed on the overview page. You can set the critical level marker to specify when the bar should turn orange.

Critical Level Marker	
Analog Threshold:	6.0 dBu
Digital Threshold:	-9.0 dBFS

To set the critical level marker:

1. Navigate to the page **BNC / XLR / Headphone**.
 2. In the block **Critical Level Marker**, define the threshold above which the bar should turn orange.
 3. Click **Save**.
- ✓ The bar indicating the audio level of the inputs and outputs now turns orange whenever the audio level is above the set value.

8.3 Changing the Headphone Volume

The input signal can be monitored via the headphone interface.



Headphone

Source: Stereo Encoder Input

Volume [-40.0 ... 0.0]: -20.0 dB

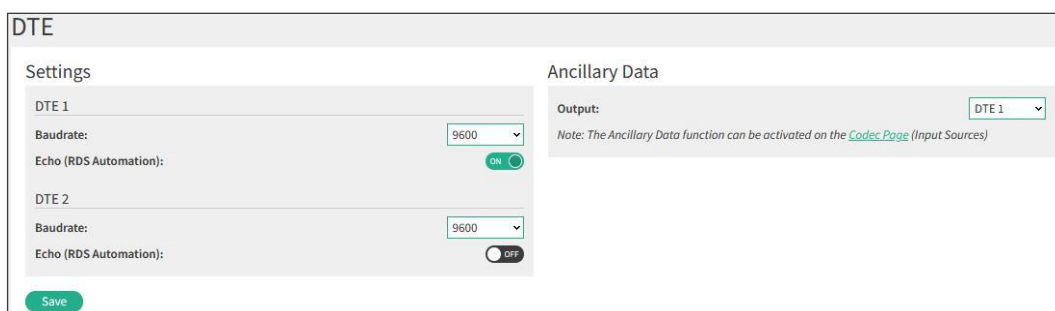
To change the volume of the headphone output:

1. Navigate to the page **BNC / XLR / Headphone**.
 2. In the block **Headphone**, select the source for the headphone output.
 3. Set the volume for the headphone output in a range from -40.0 to 0.0 dB.
 4. Click **Save**.
- ✓ The volume of the headphone output is now adjusted.

8.4 Configuring the DTE interface

The MPX-1g is equipped with two 9-pole D-Sub male connectors for serial RS-232C data communication. You can set the baud rate and activate an echo for the RDS automation function.

If the decoder receives ancillary data, the device can output them over DTE. These ancillary data can, for example, be fed to an external RDS encoder.



DTE

Settings

DTE 1

Baudrate: 9600

Echo (RDS Automation): ON

DTE 2

Baudrate: 9600

Echo (RDS Automation): OFF

Save

Ancillary Data

Output: DTE 1

Note: The Ancillary Data function can be activated on the [Codec Page](#) (Input Sources)

To configure the DTE interface:

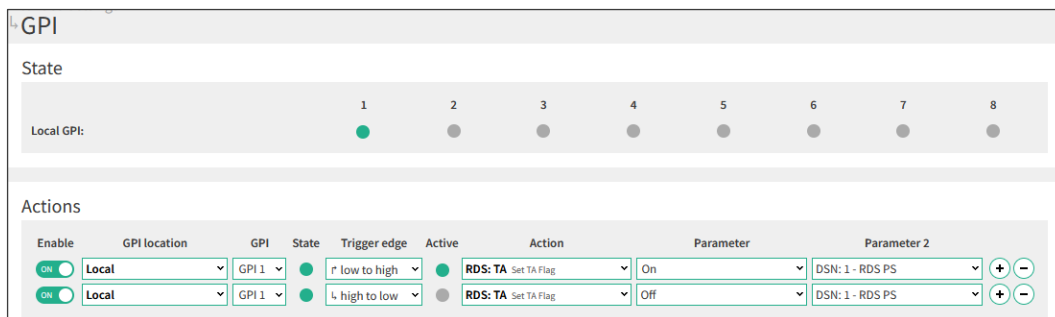
1. Navigate to the page **DTE**.
 2. Set the baud rate for each DTE.
 3. To receive feedback on the arrival of the data sent by the RDS automation function, activate the **Echo** switch.
 4. To output ancillary data over DTE, select the DTE interface. On the **Codec** page, enable **ancillary data decoding** in the input source settings.
 5. Click **Save**.
- ✓ You have configured the DTE interfaces.

To view the status of the DTE data, see 11.5 UECP Data Status.

For more information on the DTE pin layout, see 13.2 Interface Pin Layouts.

8.5 Configuring the GPI settings

The MPX-1g is equipped with 8 GPI contacts housed in the same 26-pole D-sub male connector as the GPOs. You can use the local inputs or GPI forwarding to trigger actions remotely. If you have enabled SNMP traps, a trap is sent every time a GPI switches.



Enable	GPI location	GPI	State	Trigger edge	Active	Action	Parameter	Parameter 2
☒	Local	GPI 1		↑ low to high		RDS: TA Set TA Flag	On	DSN: 1 - RDS PS
☒	Local	GPI 1		↓ high to low		RDS: TA Set TA Flag	Off	DSN: 1 - RDS PS

- To actuate a GPI, pull the corresponding control pin electrically to ground (pin 9). The resulting control current is less than 5 mA.
- To view the status of the GPIs, navigate to the page **GPI** in the section **Interface Settings**.
- For more information on the GPI pin layout, see 13.2 Interface Pin Layouts.

To configure GPI actions:

1. Enable **GPIO Tunneling** in the decoder's input source settings.
 - The forwarded GPIs are now listed on page **GPI** and on page **Overview**.
 2. Navigate to the page **GPI** in the section **Interface Settings**.
 3. In the block **Actions**, select .
 4. Configure the parameters.
- ✓ Select **Save**.

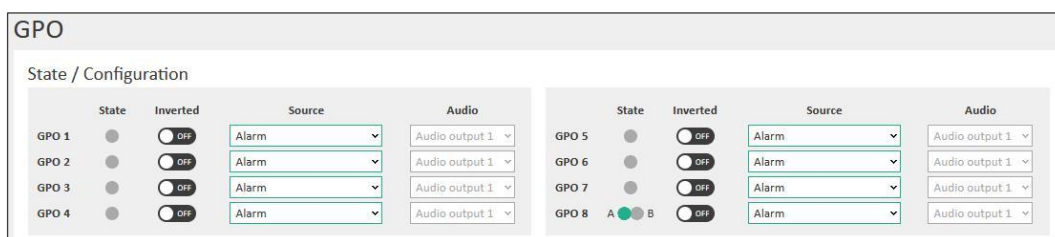
Parameters

GPI Location	Select whether to use a local or forwarded GPI.
GPI	Select the GPI to be used.
State	This virtual LED shows the state of the selected GPI: green = high, grey = low.
Trigger edge	Select when to trigger the action: either when the level is high and momentarily goes low for the trigger or when the level is low and momentarily goes high for the trigger.
Active	This virtual LED shows whether the action was last triggered and executed. The virtual LED does not show whether the device is still in the state it was set into by the action.
Action	Select the action to be executed if the GPI is triggered.
Parameter (2)	Specify the parameters for which the action should be executed.

8.6 Configuring the GPO settings

To configure the GPO settings and view the status of the GPOs:

1. Navigate to the page **GPO**.
 2. To invert a GPO, enable the corresponding switch.
 3. Select the source for the GPO switch in the field **Source**. Only GPOs that are selected for the source **Alarm** can be used to indicate a triggered alarm.
 4. If you set **Active SIP call signaling**, **SIP call ringing**, **SCTE-35** or **GPIO Tunneling** as the source, then select the audio to be used for this function in the field **Parameter**.
 5. Click **Save**.
- ✓ You have configured the GPO settings.



State / Configuration				
	State	Inverted	Source	Audio
GPO 1		☐ OFF	Alarm	Audio output 1
GPO 2		☐ OFF	Alarm	Audio output 1
GPO 3		☐ OFF	Alarm	Audio output 1
GPO 4		☐ OFF	Alarm	Audio output 1

	State	Inverted	Source	Audio
GPO 5		☐ OFF	Alarm	Audio output 1
GPO 6		☐ OFF	Alarm	Audio output 1
GPO 7		☐ OFF	Alarm	Audio output 1
GPO 8	A B	☐ OFF	Alarm	Audio output 1

The virtual LED **State** indicates the status of the GPOs (green: ON, grey: OFF). The state of a relay is ON if the alarm which is assigned to this relay is triggered.

For information on the GPO pin layout, see 13.2 Interface Pin Layouts.

8.7 Configuring the Scheduler

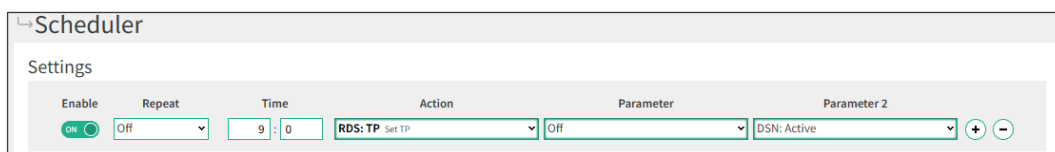
The MPX-1g offers the option to enable a scheduler to execute various actions at defined times.

To configure the scheduler:

1. Navigate to the page **Scheduler** in the section **Interface Settings**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have configured the Scheduler.

Parameters

Enable	Toggle the switch to enable the scheduler.
Repeat	Choose a repetition cycle from the drop-down menu.
Time	Choose the time.
Action	Choose an action from the drop-down menu.
Parameter/Parameter 2	Choose 1 or 2 parameters depending on the selected action.



Scheduler
 Settings

Enable	Repeat	Time	Action	Parameter	Parameter 2
☒ ON	Off	9 : 0	RDS: TP Set TP	Off	DSN: Active

9 Network Settings

9.1 Configuring the Interface Services

For each ethernet interface, you can select the services by which the interface can receive and send data.

Services

Interface services

Ctrl:

Data 1:

Data 2:

HTTP (Web)

HTTPS (Web)

SSH (SFTP)

SNMP

Ember+

Streaming Data

☒

☒

☒

☒

☒

☒

☐

☐

☐

☐

☐

☐

SNMP: Only affects get and set commands, traps are not affected

Save

To select the supported services:

1. Navigate to the page **Services**.
 2. For each individual interface, define which data can be received and sent.
 3. Click **Save**.
- ✓ The interfaces now only support the selected services.

9.2 TCP/IP: Configuring the Ethernet Interfaces

The MPX-1g has several Ethernet interfaces: 1 for configuration and the others for data exchange. Configure the interfaces for data transmission.

NOTICE

False connection of the Ethernet interfaces will lead to incorrect operation!

- Use the [Data] interfaces only for data transfer.
- Use the [Ctrl] interface only for the access to the device via the web interface and for SNMP.

To change the supported services per interface, see 9.1 Configuring the Interface Services.

TCP/IP

DNS Server

Primary:

Secondary:

Routing:

Routing Interface:

0.0.0.0

0.0.0.0

☐ OFF

Data 1

Save

Interface Settings

Link	Interface Name	Mac Address	VLAN	DHCP	IP Address	Subnetmask	Gateway	DNS Server	Speed
☒	Ctrl	00:11:99:01:13:39	☒ ON	☒ ON	192.168.100.183	255.255.240.0	192.168.96.1	0.0.0.0	Auto
☐	Data 1	00:11:99:01:13:3A	☐ OFF	☐ OFF	192.168.18.250	255.255.255.0	0.0.0.0	0.0.0.0	Auto
☐	Data 2	00:11:99:01:13:3B	☐ OFF	☐ OFF	192.168.170.183	255.255.255.0	192.168.170.1	0.0.0.0	Auto

Save

To configure the ethernet interfaces:

1. Navigate to the page **TCP/IP**.
2. Configure the parameters for the DNS Server, Ctrl and Data interfaces.



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

3. Click **Save**.

✓ The ethernet interfaces are now configured.

Parameters

DNS Server

Primary Enter the IP address of the primary domain name server (DNS).

Secondary Enter the IP address of the secondary domain name server (DNS).

Proxy Server

Enable proxy To enable the proxy server, toggle the switch.

Note: The proxy server will only be used for Icecast and MPEG DASH / HLS input streams.

Host

Port Enter the port of the proxy server.

Interface Settings

Routing Enable the Routing, which enables the DNS server to send and answer the requests over different [Data] interfaces.

VLAN Enable VLAN and enter a VLAN ID (1-4095).

Priority Assign a priority (1-7) to this stream to add a priority code point (PCP) according to the IEEE 802.1Q specification. Select 0 to disable the priority and use best-effort delivery.

DHCP Enable dynamic host configuration protocol (DHCP) which enables the device to get an IP address automatically.

IP Address If DHCP is disabled, then assign an IP address to the interface.

Subnetmask Enter the subnetmask for the IP address.

Gateway Enter the address of the local system that is used for the internet access (for example the router).

DNS Server Enter the IP address of the DNS server used.

Speed Set the network connection speed in Mbps or select **Auto**.

9.3 Using TCP/IP Tools for Network Testing

The MPX-1g features built-in TCP/IP tools for testing and diagnosing network connections. Use the ping tool for quick connectivity checks and basic latency measurements. Use the traceroute tool for a detailed analysis of the network path and to diagnose routing issues.



The screenshot shows the 'TCP/IP' configuration page with the 'Tools' tab selected. It contains two main sections: 'Ping' and 'Traceroute'.

Ping Section:

- Settings:**
 - Destination:
 - Interface:
 - Count:
 - TTL:
 - Data size (0=default):
- Buttons:** 'Start' and 'Stop' buttons.
- Output:**

```
1000 bytes from 193.99.144.85: seq=3 ttl=248 time=9.929 ms
1008 bytes from 193.99.144.85: seq=4 ttl=248 time=9.748 ms
1008 bytes from 193.99.144.85: seq=5 ttl=248 time=10.099 ms
1008 bytes from 193.99.144.85: seq=6 ttl=248 time=9.746 ms
1008 bytes from 193.99.144.85: seq=7 ttl=248 time=10.223 ms
1008 bytes from 193.99.144.85: seq=8 ttl=248 time=10.048 ms
1008 bytes from 193.99.144.85: seq=9 ttl=248 time=10.048 ms

--- www.heise.de ping statistics ---
10 packets transmitted, 10 packets received, 0% packet loss
round-trip min/avg/max = 9.746/9.986/10.223 ms
```

Traceroute Section:

- Settings:**
 - Destination:
 - Interface:
 - Max. hops:
 - Time to wait:
- Buttons:** 'Start' and 'Stop' buttons.
- Output:**

```
traceroute to www.heise.de (193.99.144.85), 20 hops max, 38 byte packets
1 192.168.96.1 (192.168.96.1) 0.220 ms (64) 0.209 ms (64) 0.164 ms (64)
2 mx204-2.ham.purtei.com (189.39.84.9) 3.393 ms (254) 3.451 ms (254) 3.515 ms (254)
3 * * *
4 100.83.140.3 (100.83.140.3) 3.457 ms (252) 4.195 ms (252) 100.83.140.11 (100.83.140.11) 3.6
5 ipv4.de-cix.fra.de.as12306.plusline.net (80.81.192.132) 10.957 ms (251) 10.632 ms (251) 9.4
6 82.98.102.7 (82.98.102.7) 10.271 ms (250) 10.882 ms (250) 11.714 ms (250)
7 * * *
8 * * *
9 * * *
10 * * *
** * * *
```

Using the Ping Tool

The ping tool helps you determine the connectivity status and latency between the MPX-1g and a specified network destination.

1. Navigate to the **TCP/IP** page and select the **Tools** tab.
2. Configure the parameters in the **Ping** block:

Destination	Enter the hostname or IP address of the destination you want to ping.
Interface	Select the network interface to use for the ping request
Count	Specify the number of ping requests to send. The default is 10.
TTL	Set the maximum number of hops (routers) the ping request can pass through. The default is 255.
Data size	Define the size of the ping packet in bytes. Enter 0 to use the default size.

3. Select **Start** to initiate the ping test.
 4. Select **Stop** to end the ping test at any time.
- ✓ The results are displayed in the **Output** block. The ping results show each packet's response time and any packet loss, indicating the connection quality and latency.

Using the Traceroute Tool

The Traceroute tool helps you trace the path that data packets take from the MPX-1g to a specified network destination. This helps identify any delays or issues occurring along the path.

1. Navigate to the **TCP/IP** page and select the **Tools** tab.
2. Configure the parameters in the **Traceroute** block:

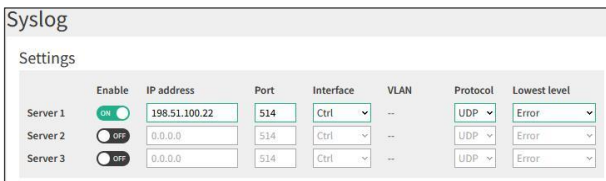
Destination	Enter the hostname or IP address of the destination you want to trace.
Interface	Select the network interface to use for the traceroute.
Max. hops	Specify the maximum number of hops (routers) the traceroute should attempt.

Time to wait Set the maximum time (in seconds) to wait for each hop's response.

3. Select **Start** to initiate the traceroute test.
 4. Select **Stop** to end the traceroute test at any time.
- ✓ The results are displayed in the **Output** block. The traceroute results list each hop's IP address and response time.

9.4 Monitoring the Device via Syslog

In addition to saving information about events in the log, you can also send them to a syslog server. Syslog eases monitoring the MPX-1g.



Settings	Enable	IP address	Port	Interface	VLAN	Protocol	Lowest level
Server 1	☒	198.51.100.22	514	Ctrl	--	UDP	Error
Server 2	☐	0.0.0.0	514	Ctrl	--	UDP	Error
Server 3	☐	0.0.0.0	514	Ctrl	--	UDP	Error

To send event information to a syslog server:

1. Navigate to the page **Syslog**.
 2. Enable at least one of the servers.
 3. Configure the parameters.
 4. Click **Save**.
- ✓ The MPX-1g now sends event information to the syslog server(s).

Parameters

IP address	Enter the IP address of the syslog server.
Port	Enter the port number.
Interface	Select the [Data] interface to be used.
VLAN	If the selected [Data] interface is an interface with VLAN, then select the VLAN to be used.
Protocol	Select the protocol to be used.
Lowest level	Select the lowest level of a message that will be sent to the syslog server. For more information see 11.9 Priority of Alarm Messages.

9.5 Setting Up SAP



This function is only available if the *Ravenna* right is activated.

The MPX-1g supports SAP (Session Announcement Protocol) for stream announcement.

Prerequisite: You are logged in as an admin.

To set up the SAP connection:

1. Navigate to the page **SAP**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have set up the SAP connection.

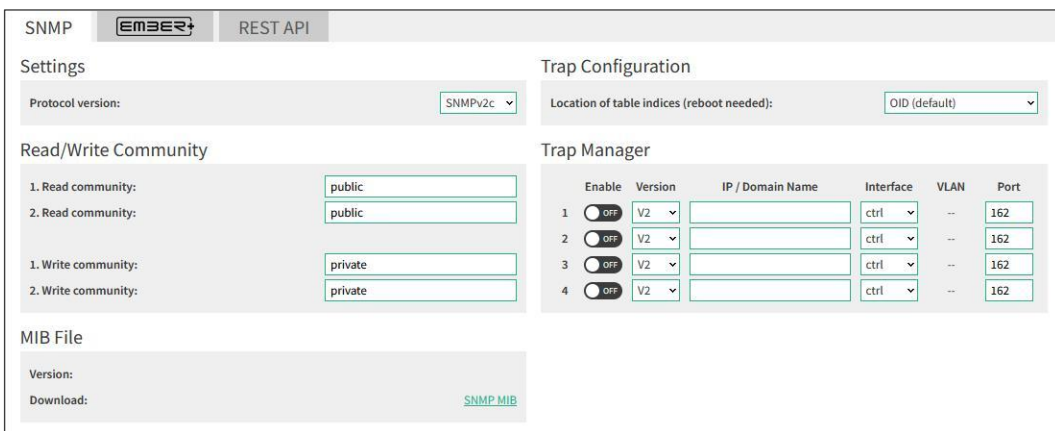
Parameters

Mode	To enable SAP, select the service mode. "Client/Server" is recommended.
Announce interval	Enter the time interval between sending SAP announcement.
Multicast loop	Multicast loop to make the MPX-1g receive its own SAP announcements. The default setting is OFF.
Receive address and port	Set the multicast address and port to receive SAP announcements.
Ethernet port	Select the [Data] interface for transmission of SAP announcements in the dropdown menu.
Bandwidth limit	To avoid overhead, set a bandwidth limit for SAP announcements.
Destination address and port	Set the destination multicast address and port for SAP announcements.

9.6 SNMP: Configuring Access Data for External Requests

You can configure access data (read community/write community) that is necessary for external SNMP requests to the MPX-1g.

SNMP (Simple Network Management Protocol) is a protocol used for managing and monitoring network devices. SNMP requests can be used to retrieve information such as the MPX-1g's current settings and performance metrics. This information can be used to diagnose problems and optimize network performance. SNMP requests can also be used to configure the MPX-1g remotely, allowing administrators to adjust settings.




For the SNMP manager tool to operate correctly, it requires the specific MIB files. These MIB files must be compiled by your SNMP manager tool. You can save the MIB files in the block **MIB File**.

1. Navigate to the page **External APIs**.
 2. Click on the tab **SNMP**.
 3. Select the protocol version in the block **Settings**.
 4. Configure the parameters in the block **Read/Write Community** or **SNMPv3 User / Security**. The parameters differ depending on the selected protocol version.
 5. Click **Save**.
- ✓ You have configured the access data for external SNMP requests.

Parameters

Read/Write Community

Read Community Enter SNMP access data for the external read-only SNMP access to the device.

Write Community Enter SNMP access data for the external write SNMP access to the device.

SNMPv3 User/Security

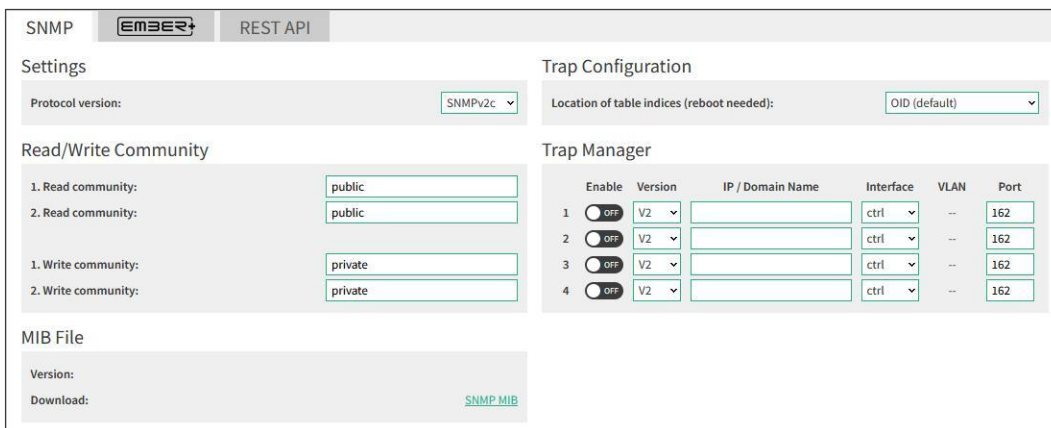
Read/Write user Enter username and password for the external write SNMP access to the device.

ReadOnly user Enter username and password for the external read-only SNMP access to the device.

Security protocols Select an authentication protocol and a privacy protocol.

9.7 SNMP: Configuring Trap Managers

As part of the monitoring function, the device can send SNMP traps to the defined IP addresses of the SNMP managers. SNMP traps are messages that are sent from a network device to a central management system when a specific event or condition occurs. SNMP traps are used as a means of notifying network administrators of important events, such as errors or performance issues, allowing them to take corrective action as needed. You can also read out the settings via SNMP Get.



The screenshot shows the SNMP configuration page with the following sections:

- Settings:** Protocol version: SNMPv2c.
- Trap Configuration:** Location of table indices (reboot needed): OID (default).
- Read/Write Community:**
 - 1. Read community: public
 - 2. Read community: public
 - 1. Write community: private
 - 2. Write community: private
- Trap Manager:**

	Enable	Version	IP / Domain Name	Interface	VLAN	Port
1	☐ OFF	V2		ctrl	--	162
2	☐ OFF	V2		ctrl	--	162
3	☐ OFF	V2		ctrl	--	162
4	☐ OFF	V2		ctrl	--	162
- MIB File:**
 - Version:
 - Download: [SNMP MIB](#)



For the SNMP manager tool to operate correctly, it requires the specific MIB files. These MIB files must be compiled by your SNMP manager tool. You can save the MIB files in the block **MIB File**.

1. Navigate to the page **External APIs**.
 2. Click on the tab **SNMP**.
 3. Select the protocol version in the block **Settings**.
 4. Select the location of the table indices in the block **Trap Configuration**: OID or OID plus additional index.
 5. Configure the parameters in the block **Trap Manager**.
 6. Click **Save**.
- ✓ You have configured the trap managers. If you change the location of table indices, the MPX-1g must reboot. Each enabled trap is sent once at startup for initialization.

Parameters

Version Select the format version of the SNMP traps.

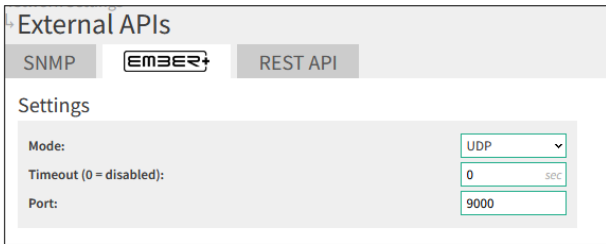
IP or Domain Name Enter the IP address or domain name of the trap receiver.

Interface Select the [Data] interface to be used.

VLAN	If the selected [Data] interface is an interface with VLAN, then select the VLAN to be used.
Port	Enter the port number.

9.8 Ember+: Configuring Access for Monitoring

As part of the monitoring and remote-control function, the device is capable to be controlled via the Ember+ protocol.



1. Navigate to the page **External APIs**.
 2. Click on the tab **Ember+**.
 3. Configure the parameters in the block **Settings**.
 4. Click **Save**.
- ✓ You have configured the Ember+ access.

Parameters

Mode	Select the mode from the dropdown menu.
Timeout	Enter the value for interval in seconds for a timeout.
Port	Enter the port number for the connection.

9.9 Enabling the REST API

A REST API is a standardized method for software applications to communicate over the internet. It operates based on REST principles, using HTTP requests and responses. The REST API enables seamless integration with other applications. It simplifies control through familiar HTTP methods, offers remote management, and facilitates automation, real-time monitoring, scalability, and extensibility. With help of the REST API, you can automate tasks and efficiently manage your audio codec system.

2wcom's REST API is compliant to Open API 3.0. For more information on Open API 3.0, refer to the official documentation: <https://swagger.io/specification/>

To enable the REST API:

1. Navigate to the page **External API**.
 2. Select the tab **REST API**.
 3. Set the switch **Enabled** to **ON**.
 4. Click **Save**.
 5. Download the file **openapi.json** from the page.
- ✓ You have now access to the REST API of the MPX-1g. For detailed information for developers, refer to the API documentation: https://download.2wcom.com/general/2WCOM_REST_API.pdf

9.10 Monitoring Audio via Live Listening

Live Listening is a function for audio monitoring via web interface or any web stream client. Live Listening enables you to listen "live" to any of the audio input sources as well as the audio outputs directly over the web interface. The MPX-1g is equipped with an adjustable bit rate encoder that can encode the input audio signal in five different formats. You can manually set up the parameters for audio encoding depending on the bandwidth available for data distribution.

Prerequisite: You have already configured the input sources and assigned them to the encoder and decoder.

10 System Settings

10.1 Entering Device Information

For better identification of the MPX-1g, you can enter device-specific data.

1. Navigate to the page **Global**.
 2. Configure the parameters in the block **System Info**.
 3. Click **Save**.
- ✓ The saved information is now displayed in the banner.

Parameters

Name	Enter the name of the device for better reference.
Location	Enter the location of the device.
Description	Enter further important information on the device.

10.2 Setting Up Session Timeout

Session timeout is a security feature that automatically logs out the user after a period of inactivity. You can define the period of inactivity or disable session timeout.

1. Navigate to the page **Global**.
 2. In the field **Session timeout**, enter the value in minutes for the period of inactivity necessary to automatically log out the user. Enter "0" to disable this function.
 3. Click **Save**.
- ✓ You will now be automatically logged out after the set period of inactivity.

10.3 Changing the Title of the Browser Tab

You can change the title of the browser tab to display the information you need for better reference.

1. Navigate to the page **Global**.
 2. Configure the parameters in the field **Browser tab config**.
 3. Click **Save**.
- ✓ The title of the browser now displays the configured information.

Parameters

Favicon	Set the look of the favicon (tab icon). Some favicons dynamically display the sum status of the status LEDs. If there is a red status LED, the favicon status also turns red. If there is no red status LED but an orange one, the favicon status turns orange. Otherwise, the favicon remains blue.
Title	Enter the information you want to display. You can use variables for specific information. Variables will update automatically if the corresponding information changes. View the possible variables by hovering over the input field.

10.4 Generating and Downloading a Diagnostic Report

In case of any problems or failures, you can generate and download a diagnostic report to send to 2wcom.

To generate and download a diagnostic report:

1. Navigate to the page **Global**.
 2. In the block **Diagnostic Report**, select the time period for which the device captures all activities.
 3. Click **Generate**. A file is being created. This may take a while. Do not interrupt this process.
 - The download option with the time and date of file creation appears.
 4. Click **Download**.
 5. Save the file to a location of your choice.
- ✓ You have generated and downloaded a diagnostic report.

10.5 Rebooting the Device

To reboot the device:

1. Navigate to the page **Global**.
 2. In the block **Control**, click **Now** in the field **Reboot Device**.
- ✓ The device restarts. After the restart, you will have to log in again.

10.6 Restoring Factory Settings

Restoring the factory settings will delete all configurations that were made by a user except for the IP address of the CTRL interface. This also applies to the access accounts.

To reset the device to factory settings:

1. Navigate to the page **Global**.
 2. In the block **Control**, click **Now** in the field **Load Factory Settings**.
- ✓ You have restored the factory settings.



10.7 Updating the Firmware with a File

There are different ways to update the firmware of your 2wcom device.

You can update the firmware directly via the web interface. For more information see 12.3.1 Checking for Updates.

Alternatively, you can upload ARM firmware stored locally and activate it via the web interface or load a firmware file from a USB stick.

To install a firmware file via the web interface:

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop** and select the firmware file you want to upload. Alternatively, you can select a firmware file that was previously uploaded to the **Storage** page.
 3. Click **Upload / Activate** to install the firmware file. This may take a while. Do not interrupt this process.
 4. After a successful activation, follow the prompt to restart the device.
- ✓ After the reboot, the new firmware is active.

To manually install firmware from a USB stick via the LCD menu:

1. Insert a USB stick with the firmware file into the [USB] port.
 2. Use the jog wheel to select **Config menu** → **System** → **Global** → **Update firmware from USB**.
 3. Select the firmware file you want to upload.
 4. Select **Update**. The installation may take a while. Do not interrupt this process.
 5. Select **OK** to reboot the device.
 6. Remove the USB stick from the device.
- ✓ After the reboot, the new firmware is active.

To automatically install firmware from a USB stick:

1. Create a folder named "autoupdate" on the USB stick.
 2. Place the firmware file in the "autoupdate" folder. Make sure that the folder only contains one firmware file.
 3. Insert the USB stick into the [USB] port.
 - The device automatically finds the firmware file on the USB stick. If the firmware version of the file differs from the currently installed one, the device automatically installs the new firmware. The installation may take a while. Do not interrupt this process.
 4. Select **OK** to reboot the device.
 5. Remove the USB stick from the device.
- ✓ After the reboot, the new firmware is active.

10.8 Activating rights

Some functions of the MPX-1g are optional and licensed. To use these functions, you must activate additional rights by uploading a rights file. To receive rights files, please contact your 2wcom sales representative. For more information see 3.2 Software Rights.

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop**.
 3. Select the rights file (*.2wcom_key) that you want to upload.
 4. Click **Upload**. The upload may take a while. Do not interrupt this process.
 5. After a successful upload, follow the prompt to restart the device.
- ✓ The new rights will be active after restart. You can view the current rights in the block **System information**.

10.9 Uploading and Activating an SSL Certificate

An SSL certificate is a digital certificate that provides authentication for a website and enables an encrypted connection.

To upload and activate an SSL certificate:

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop**.
 3. Select the SSL certificate file (*.pem) you want to upload.
 4. Click **Upload**. The upload may take a while. Do not interrupt this process.
- ✓ You have uploaded an SSL certificate.

10.10 Generating and Saving a Settings File

You can download the current settings and save them as a file either to your local storage or to the internal storage of the MPX-1g. You can use this file later to restore the settings or upload it to another device to copy the settings.

1. Navigate to the page **Global**.
 2. In the block **Settings Download**, enter a file name and click **Generate**.
 - A file is being created. This may take a few seconds.
 - The download option with the time and date of file creation appears.
 3. Click **Download**.
 4. Save the file to a location of your choice.
 5. Click **Save**.
- ✓ You have saved settings to a local file. To upload and activate the settings stored locally, see 10.11 Loading Settings from a File.

10.11 Loading Settings from a File

You can upload a settings file to restore previous settings or copy the settings from another device. You can do this either via the web interface or the LCD menu. You can load the settings either without or including IP settings such as IP addresses and VLANs. This enables you to easily swap out a device. Note that if you load settings including IP via the web interface, you will lose the connection to the device due to the new IP address. For information on how to generate a settings file, see 10.10 Generating and Saving a Settings File.

To load a settings file via the web interface:

1. Navigate to the page **Global**.
 2. In the block **Upload / Activate**, click **Browse/Drop** and select the settings file you want to upload. Alternatively, you can select a previously uploaded or saved file from the internal storage of the device.
 3. Click **Upload / Activate** to install the settings file. The file upload may take a while. Do not interrupt this process.
- ✓ The new settings are now active. If you chose to also load the IP settings, the device now has a new IP address.

To load a settings file via the LCD menu:

1. Insert a USB stick with the settings file into the [USB] port.
2. Use the jog wheel to select **Config menu** → **System** → **Settings** → **Load from USB** or **Load from USB (incl. IP)**.
3. Select the settings file you want to upload.
4. Select **Upload**. The file upload may take a while. Do not interrupt this process.
- ✓ The new settings are now active. If you chose to also load the IP settings, the device now has a new IP address.

10.12 Uploading a Debug Script

To identify a specific error, you can upload a debug script that you have received from 2wcom. Depending on the expected error, the debug script monitors extra status information and records the incoming data. When the error occurs, the recording stops and a debug.log file is generated which contains all information that 2wcom needs to fix it.

To upload a debug script:

1. Navigate to the page **Global**.
2. In the block **Debug Report**, click **Browse/Drop file**.
3. Select the debug script file (*.upd) you want to upload.
4. Click **Upload**. The upload may take a while. Do not interrupt this process.
5. To start the debugging process, click **Start**. This may take a while. Do not interrupt this process.
 - When an error occurs, the script is automatically stopped. A download link for the debug.log file appears.
6. To download the debug.log file, click on the link.
7. Send the file to your 2wcom contact person.
- ✓ 2wcom can now identify the error and determine further action.

10.13 Configuring Time / Clock settings

The page **Time / Clock** lets you set the time and date, configure settings for GPS, PTP, NTP, 1PPS and External Clock, and define Switch Criteria. You can view the status of these options in the section **Status** on the page **Time / Clock** (see 11.4 Time / Clock Status).

Time

To change time zone, time and date:

1. Navigate to the tab **Time**.
2. Set the preferred time zone in the block **Local time**.
3. To change the time and date, enter new time and date in the block **Time and date settings**.
Note: This setting might not be available when PTP or NTP synchronization is enabled.
- ✓ You have changed the time zone and time and date.

PTP

The MPX-1g can use a PTP (Precision Time Protocol) server as an external clock source. PTP is used to synchronize the internal clock of the device and to manage transmission delays for SFN (Single Frequency Network).



This function is only available if the right *Ravenna* is enabled.

To configure a PTP server as an external clock source:

1. Navigate to the tab **PTP**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have configured a PTP server as an external clock source.

Parameters

Enable	Toggle the switch next to the ethernet interface you want to use for PTP.
VLAN	If the selected interface is an interface with VLAN, then select the VLAN to be used.
Domain number	Enter the domain number.
Delay mechanism	The delay mechanisms measure the path delay between the PTP grandmaster, the internal clock of the device and all clocks along that path. The available mechanisms differ in accuracy of synchronization and supported networks. Select a delay mechanism to use: Auto: Depending on the signals the system receives the delay mechanism is automatically set. E2E: End-to-end delay mechanism measures the delay between the internal clock of the device and the PTP grandmaster directly, disregarding any other clocks along the path. P2P: Peer-to-peer delay mechanism measures the delay between directly connected peers along the path from the internal clock of the device to the PTP grandmaster. P2P is a very accurate delay mechanism but it only works if all clocks along the path support P2P. None: The delay mechanism Auto is automatically selected.
QoS DSCP general	Select a Differentiated Services Code Point (DSCP) to determine the Quality of Service (QoS) for general messages.
QoS DSCP event	Select a Differentiated Services Code Point (DSCP) to determine the Quality of Service (QoS) for event messages.
Unicast	Toggle the switch to enable Unicast. If PTP Unicast is enabled, enter the unicast URL or IP address.

NTP

The MPX-1g can use an external NTP (Network Time Protocol) server as an external clock source. NTP is used to synchronize the internal clock of the device and to manage transmission delays for SPN (Synchronous Playout Network). The configurable parameters on this page may differ depending on the activated rights.

To configure an external NTP server as an external clock source:

1. Navigate to the tab **NTP**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have configured an external NTP server as an external clock source.

Parameters

Enable	Select to enable NTP.
Bind to interface	To bind the NTP synchronization to a specific IP interface, set the switch to ON . Select the IP interface or VLAN.
QoS DSCP	Select a Differentiated Services Code Point (DSCP) to determine the Quality of Service (QoS). The selected packet will be prioritized.
NTP Quality rating	Select the quality of the NTP server. Low: Event logging, device time synchronization. Medium: For NTP servers that are accessed through the Internet and are used as External Clock source. High: For Stratum 1 NTP servers that are connected locally and are used as External Clock source. (SPN) Note: For Medium and High settings NTP will be rated as valid once the clock discipline algorithm has converged to acceptable RMS offset and skew values. For the Low setting, NTP becomes valid much quicker with reduced accuracy, however it will increase over time.
Expert settings	Set the switch to ON to show further parameters.
1.-4. Server URL / IP	Enter the URL or IP address of the NTP servers to be used.

External Clock

You can synchronize the MPX-1g with an external clock. Precise synchronization of time across devices on a network is critical to avoid audio distortion or loss of quality. By using an external clock source, audio codecs can ensure that they are operating with the same time base, allowing them to maintain a consistent audio stream. By keeping all devices synchronized to an external clock source, audio codecs can ensure that their output remains high-quality and reliable. You can configure 1 main and up to 2 backup clocks. Available external clock sources for the main and backup clock sources are **PTP**, **1PPS**, **NTP** and **GPS**. If you do not want to set any of the clock sources, select **None**. Note that if you want to set both **NTP** and **PTP** as external clock sources, **PTP** has to be set as the superior source.



The function PTP is only available when the right *Ravenna* is enabled.

The function 1PPS is only available when the right *SFN* is enabled.

The function GPS is only available when the correct expansion module is installed.

To configure the external clock sources:

1. Navigate to the tab **External Clock**.
 2. Select the main clock source.
 3. Select clock sources for Backup 1 and 2.
 4. Click **Save**.
- ✓ You have configured the external clock sources.

Switch Criteria

The MPX-1g can automatically switch between different clock sources in case of failure. The device receives data from all configured clock sources but only uses the source of the highest priority that is error-free. The source with the highest priority is the main source. As soon as an error is detected the clock source is changed to the source with the next highest priority. The switch criteria define how the clock sources are monitored, which values are considered faulty and when the sources are switched.

To define switch criteria:

1. Navigate to the tab **Switch Criteria**.
 2. Configure the parameters.
 3. Click **Save**.
- ✓ You have defined the switch criteria.

Parameters

Common

Fallback mode	Select the mode that the device should switch to in case all configured external clock sources fail. Select Holdover to use the last available clock source. Select Internal clock to use the internal clock of the system.
Expert settings	Select to enable expert settings.

Criteria(s)

State/Server	Shows the state of PTP, 1PPS and GPS and the NTP server availability.
Master offset	Time difference between the internal clock of the device and the PTP grandmaster clock in μ s.
RMS offset	The root-mean-square offset is a long-term average offset to the currently estimated time.
Initial skew	The frequency offset to the clock standard.

Time settings

T1	The T1 setting defines how long a sync source may be faulty before it is rated as bad and switched to a backup. Faulty means that one of the criteria must be met.
T2	If a source is rated as bad, no criterion must be fulfilled for the T2 time (everything is OK) until the source is rated as good again.

10.14 Changing Login Data

The default accounts are a read-only access (Guest account), a full access without a permission to manage the user accounts (Manager account), and a full access (Admin account). The user account SFTP service is used only for the access from an external SFTP client for uploading audio files and saving them in the internal storage.

Change the login data after the first login to the web interface.

The default login data for the first login are (case sensitive):

- Guest account: "guest"/ "guest"
- Manager account: "manager"/ "manager"
- Admin account: "admin"/ "admin"
- FTP service: "sftpuser"/ "sftpuser"

To change the login data:

1. Log in as an admin.
 2. Navigate to the page **User** in the section **System Settings**.
 3. In the tab **Login Data** change the login data for an account in the corresponding block and repeat the new password.
 4. Click **Save**.
- ✓ You have changed the login data.

10.15 Adapting the Access for User Accounts

You can configure the access to certain web interface pages for the manager and guest accounts.

Prerequisite: You are logged in as an admin.

To adapt the access for manager and guest accounts each individual MPX-1g menu:

1. Navigate to the page **User**.
 2. Click on the tab **Menu Access**.
 3. Enable or disable the access to the separate menus by setting the corresponding switch to either **ON** or **OFF**.
 4. Click **Save**.
- ✓ The new access configuration is now active.

10.16 Accessing the recovery mode via reset pin hole

If you cannot access the MPX-1g via the web interface, you can reboot the device using the reset pin hole. You can also use the reset pin hole to access the recovery mode in which you can flash the device or restore factory settings.

- To restart the device, press the reset button for a second.
1. To access the recovery mode, press the reset button for a few seconds until all LEDs on the front panel turn off and only power LED starts flashing quickly.
 - The device starts in recovery mode.
 2. Access the recovery web interface by entering the IP address of the device into a web browser. In recovery mode, you can upload and activate firmware, reset the system to factory settings or reboot the device.



3. After flashing or resetting the device, reboot the device by clicking **Reboot**.
- ✓ After a few seconds, the device will be ready for operation.

10.17 Setting a PIN Code for the LCD Menu

You can set a PIN code to ensure that only authorized personnel can change any settings through the LCD menu.

LCD Menu Access Settings

PIN lock enabled: ☒

PIN code:

Timeout (back to locked state): s

Hide IP addresses when locked: ☐

LCD Menu Access Status

Lock Status: Locked

[Unlock](#)

To set a PIN code:

1. Navigate to the page **User**.
 2. In the block **LCD Menu Access Settings** in the tab **Login Data**, enable the function **PIN lock enabled**.
 3. Enter a PIN code and the timeout duration after which the LCD menu locks.
 4. Determine whether the IP addresses should be hidden or shown when the LCD menu is locked.
 5. Select **Save**.
- ✓ The LCD menu is now secured by a PIN code. The status of the LCD menu is displayed in the block on the right. To unlock or lock the LCD menu through the web interface, select **Unlock/Lock**.

10.18 Setting Up Alarms

You can set several alarms that trigger in case of defined events. You can monitor the following:

1PPS clock status	Alarm is triggered if 1PPS signal is not present.
AES/EBU No Signal	Alarm is triggered if no decoded digital audio is available in the audio input.
Audio error count	Alarm is triggered if the error counter increases by one. The alarm ends if the error counter stops increasing for a set period of time.
Buffer level	Alarm is triggered if there will soon be not enough retained data to play out as buffer.
Watermarking present	Alarm is triggered if the Kantar watermarking detector detects no audio watermark.
Watermarking content ID	Alarm is triggered if the detected watermark content ID does not match the specific content ID configured in the input source.
LAN link	Alarm is triggered in case of an error in Ethernet data communication.
No input data	Alarm is triggered if no input data is detected.
NTP clock status	Alarm is triggered if no NTP server is available.
Primary power supply (left)	Alarm is triggered in case of an error in the primary power supply unit. Note: If two power supply units are installed but only one is used, the LED for power will always toggle between red and green. To avoid this, enable the alarm of the power supply unit that is in use.
Secondary power supply (right)	Alarm is triggered in case of an error in the secondary power supply unit. Note: If two power supply units are installed but only one is used, the LED for power will always toggle between red and green. To avoid this, enable the alarm of the power supply unit that is in use.
SFN accuracy	Alarm is triggered if SFN accuracy exceeds the set value for a set amount of time.
Silence Detection	Alarm is triggered if the device detects silence in the left and/or right channel of the audio output.
Temperature	Alarm is triggered if the device temperature exceeds the configured value.
UECP Data sources	Alarm is triggered if no data is received via the UECP data source.

UECP MECs	An alarm is triggered if a specific MEC has not been received for a set duration. This alarm can be set for all DSNs or just a specific one.
-----------	--

To set up alarms:

1. Navigate to the page **Alarm**.
 2. For each alarm, configure the corresponding parameters.
 3. Click **Save**.
- ✓ Enabled alarms will now be saved in a log entry and signaled over SNMP, LED or GPO if triggered.

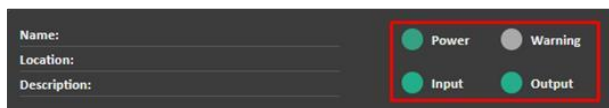
Parameters

Enable	Enable or disable an alarm.
Priority	Select the priority of the alarm message. (see 11.9 Priority of Alarm Messages)
Values	Enter the value below or above which the alarm triggers.
T1	Set the delay time for alarm trigger.
T2	Set the delay time for alarm end.
SNMP, LED, GPO	Enable the corresponding switch if the alarm should be signaled by SNMP traps, an LED or GPO switch. The corresponding GPO must be activated for the source "Alarm" (see 8.6 Configuring the GPO settings).

11 Status Information

11.1 Status LEDs

The MPX-1g is equipped with 4 status LEDs on the banner of the web interface that display the status of the inputs, outputs, power supply and alarms.



The following table displays the meaning of each LED:

LED	Color	Meaning
Power		All supply cords are connected and the power supply is OK.
		Toggles (green/red) if only one power supply is connected or OK. Note: If two power supply units are installed but only one is used, the LED for power will always toggle between red and green. To avoid this, enable the alarm of the power supply unit that is in use. For more information see 10.18 Setting Up Alarms.
Warning		LED is off if no alarms are triggered.
		At least one alarm is triggered.
Input		The decoder chain output is not used as an input source.
		The highest-priority source in the decoder chain is ok.
		The highest-priority source in the decoder chain is bad but at least one backup source is OK.
		All sources in the decoder chain are bad.
Output		No signal output over the physical interfaces.
		A signal is output over the physical interfaces.

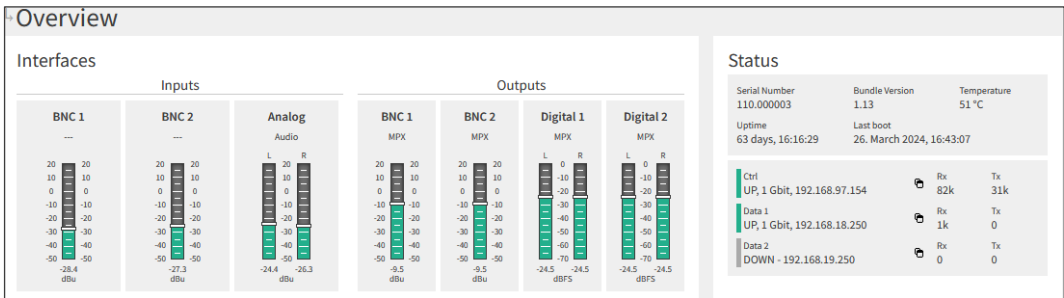
11.2 General Overview

Overview Page

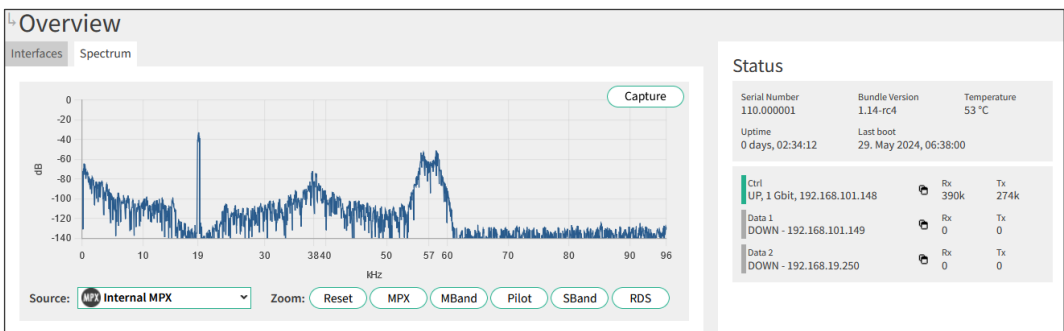
The **Overview** page gives you general information on the status of your MPX-1g. The appearance of this page may differ depending on the activated rights, built-in modules, and settings.

The levels of the inputs and outputs are displayed in the **Interfaces** block. To change the threshold above which the bar turns orange, see 8.2 Setting the Critical Level Marker.

The **Status** block gives general device-specific information as well as information on the Ethernet interfaces.

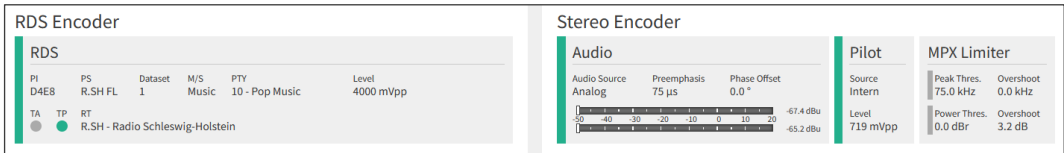


In the **Spectrum** block, select a source to be displayed. You can capture the spectrum or zoom in on specific parts.



RDS Encoder and Stereo Encoder

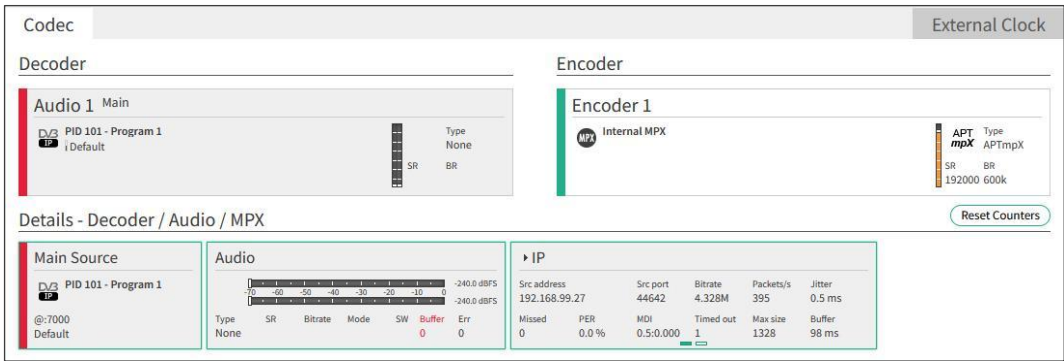
The **Overview** page also displays information on the status of the RDS encoder and stereo encoder. The **RDS Encoder** block displays the most important current RDS data. The **Stereo Encoder** block displays information on the audio, pilot tone, and the MPX limiter.



Codec

The **Overview** page displays information on the encoder and decoder status if the respective rights are activated.

To get a quick and detailed overview, you can view the current status of the encoder and decoder. To view the codec status, navigate to the **Overview** page and click on the **Codec** tab.



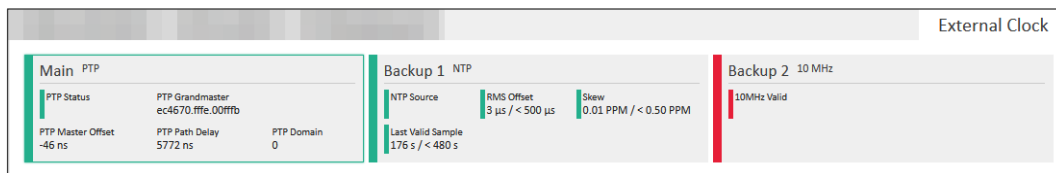
- To view more details of an encoder or decoder, click on the corresponding panel.
- To reset the counters in the status fields, click **Reset Counters**.

The following abbreviations may appear in the codec status overview:

SR	Sampling rate
SW	Sampling width
FEC	Forward error correction
Err	The number of errors in the decoder (e.g. failed samples, no audio, PER)
PER	Packet error rate of the input stream

External Clock Status

If an external clock is used, then it is displayed as  on the page **Overview**. The tab **External Clock** gives quick status information on the external clock. This block shows the active clock source and the configured backup sources as well as their status information. For more information on the NTP servers, see 11.4 Time / Clock Status.



11.3 Device Status

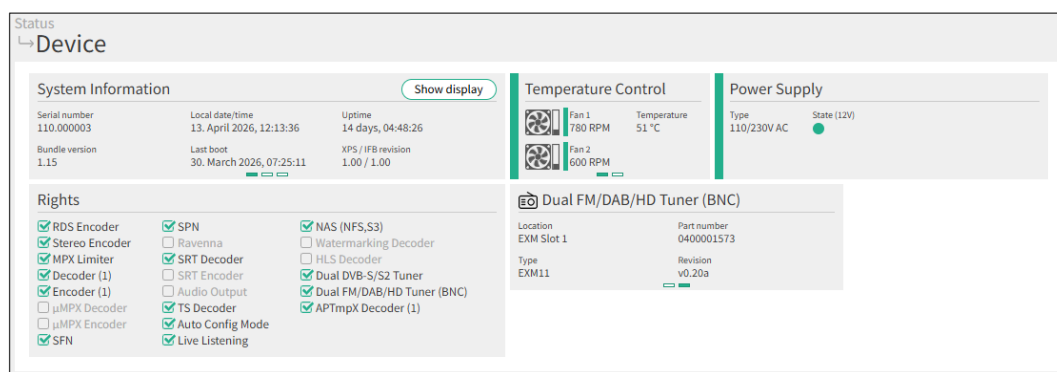
The page **Device** displays information about the software and hardware of the device as well as a list of all currently activated and available rights. Furthermore, the status of the temperature control, voltages and the power supply of the device are displayed.

To show the LCD display of the device, click on **Show display** in the block **System Information**. This view mirrors the current display on the front of the device exactly. For remote control, the jog dial can be rotated using the mouse wheel. A left click simulates a click on the jog dial.

To show the Open Source Acknowledgement, click on **Show OSA** in the block **Bundle Versions**.

- The first block displays the **System Information**, information about the **Bundle Versions** and information about the **Codec Versions**.
- The block **Rights** lists all available rights for the device. The rights with the green checkmark next to them are the activated rights. The rights that are grayed out are available but currently inactive. For more information on activating rights see 10.8 Activating rights.
- The block **Temperature Control** displays the speed of the fans in rpm and the temperature of the device in Celsius. The colored bar indicates the status: green - ok, red - there is a problem with one of the fans.
- The block **Voltages** displays the voltages of various parts of the device and mainboard. The green bars next to the voltages indicate that the voltages are in an acceptable range.

- The block **Power Supply** displays the status and type of the power supply units installed in the device. The colored bar indicates the status: green – ok, red – no power. If only one power supply module is built in, only one block is displayed on this page.
- The block **network** displays information about the last received heartbeat, the interval of the heartbeat and the configured group memberships. If network is not enabled for the device, this block is not shown.
- The block next to the rights or network displays built-in hardware options. If no hardware options modules are built in, this block is not shown.



11.4 Time / Clock Status

The page **Time / Clock** gives information on the status of 1PPS, GPS, PTP, NTP and External Clock. In the tab **PTP / NTP**:



Depending on the activated rights, the tab might only say NTP.

- The block **Present Date / Time** displays the current set date, time and time zone.
- The block **Leap Second Status** displays information about the leap second.
The table below explains the data that is displayed in this block:

TAI-UTC Offset	Shows the time difference between the atomic time (TAI) and the coordinated universal time (UTC).
Data valid until	Shows the end of validation of the current leap second file.
Next Offset	Shows the next leap second offset if already announced.
Next Leap Second	Shows the date of the next leap second if already announced.

- The block **Synchronization Status** displays information about the synchronization source.
The table below explains the data that is displayed in this block:

Sync source	Displays the source that is currently used for synchronization.
Last reference time (UTC)	The time (UTC) at which the last measurement from the reference source was processed.
Stratum	The stratum value indicates how many levels away the NTP server is from the primary reference source. Lower stratum values indicate a closer and more accurate clock source.
Frequency	The rate by which the clock would be wrong if it were not corrected.
Skew	The frequency offset to the clock standard.

RMS offset

The root-mean-square offset is a long-term average offset to the currently estimated time.

- The block **Clock Sources** displays the configured NTP or PTP clock sources. If no NTP or PTP clock source is configured, this block is not shown.
The table below explains the data that is displayed in this block:

Source state

Current best: the best source which is currently selected for synchronization
Combined: other sources selected for synchronization which are combined with the best source.
Not combined: any other source.

Stratum

The stratum value indicates how many levels away the server is from the primary reference source. Lower stratum values indicate a closer and more accurate clock source.

Frequency

This is the estimated residual frequency for the server.

Freq. skew

The frequency offset to the clock standard.

Measured offset

The measured time difference between the local clock and the server's clock at the time of synchronization.

Estimated error

The total worst-case timing error accumulated between the stratum 1 server and the client.

Poll

Polling interval, which is the frequency at which the device queries the server for time updates.

Reach

Indicates the reachability of the server. This is a bitmask value that shows how successfully the device has been able to reach and communicate with the server.

Last RX

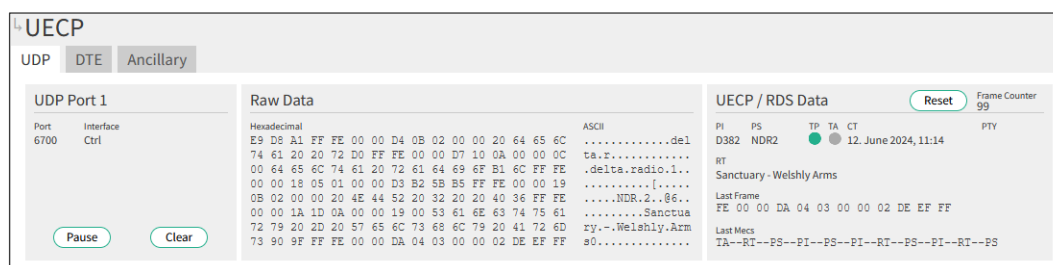
Shows how long ago the last good sample was received from the source.

In the tab **External Clock**:

- The block **Main** displays information about the external clock source that is set as the main source.
- The blocks **Backup 1** and **Backup 2** display information about the external clock sources that are set as backup sources.

11.5 UECP Data Status

If the MPX-1g receives UDP, DTE, or ancillary data, their status is displayed on the **UECP** status page.



The screenshot shows the UECP status page with three tabs: UDP, DTE, and Ancillary. The UDP tab is selected, showing 'UDP Port 1' with Port 6700 and Interface Ctrl. Below this are 'Pause' and 'Clear' buttons. The 'Raw Data' section displays hexadecimal and ASCII data. The 'UECP / RDS Data' section shows a 'Reset' button, 'Frame Counter 99', and various status indicators (PI, PS, TP, TA, CT, PTY) with values like D382, NDR2, and 12. June 2024, 11:14. It also lists 'Sanctuary - Welsh Arms' and 'Last Frame' data.

- The **Raw Data** block displays the data in hexadecimal and ASCII code.
- The **RDS/UECP Data** block displays the information on the active RDS/UECP data as well as the total frames.
- To pause the data recording, click **Pause**.
- To clear the log, click **Clear**.

11.6 UECP Log

The **UECP Log** page displays the received UECP data. You can search for specific entries, view statistics, download the log, or upload a previously downloaded log file (*.uecplog) to be displayed.

If the device dropped any MEC/UECP commands due to the UECP settings, the log entry is displayed with a bin  icon. To not save dropped commands to the log, disable this function in the **Settings** block.

UECP Log

Load from device

UECP Source: All Sources

Load Count: (max: 100000) 10000

RAW Data: OFF

Load from device

Load from file

UECP log file (*.uecplog): Browse / Drop file

File: No file selected

Load from file

Settings

Save dropped MEC / UECP commands: ON

Save

10000 log entries loaded!

View statistics

Download as *.csv

Download as *.uecplog

Log details:

Date: 2024.06.19 - 09:50:12 | Source: All Sources

Filter: Example: [MEC=RT]]Radio

Operations: "&i" for AND, "|" for OR
Column filter: "[COL=Search Text]" ("COL"-Tag list)

No.	Date	Time	Source	Site	Enc.	Seq.	DSN	PSN	MEC	Content
1	2024-06-19	01:41:21	ANC		0	0	67	0	0	PS NDR 2
2	2024-06-19	01:41:25	ANC		0	0	68	0	0	PS NDR 2
3	2024-06-19	01:41:29	ANC		0	0	69	0	0	PS NDR 2
4	2024-06-19	01:41:30	ANC		0	0	70	0	0	RT A/B Flag 0 Transmission 0 Configuration Flush RT Radio Text Shadow Of The Day - Linkin Park

11.7 Internal Storage

You can upload audio files to the internal storage to use them e.g. as a backup input source. You can also upload settings files and firmware files to install later. Generated settings files also appear on the **Storage** page.

If the *Ravenna* right is activated, the **Storage** page also lists downloadable SDP files that contain vital information on the stream.

Storage

Data storage

5811.1 MB free of 6282.7 MB

Audio files

Settings files

Upload file

Note: Only for file size < 100MB (for bigger files use SFTP)

Supported file types: Audio Firmware Settings

Browse / Drop file

No file selected

Upload

Filename	Date (UTC)	Size	
20HeyNow.wav	21.08.2025 12:42:22	57 MB	 
airshow.wav	10.04.2024 10:48:12	16.5 MB	 

- Prerequisite: You are logged in as an admin.

To upload a file to the internal storage:

1. Navigate to the **Storage** page.
 2. In the **Upload file** block, select **Browse/Drop file**.
 3. Select the audio file, firmware file, or settings file that you want to upload.
 4. Click **Upload**. The upload may take a while. Do not interrupt this process.
 - The uploaded file is now displayed in the corresponding tab.
- ✓ You have uploaded a file to the internal storage. The percentage of used storage is displayed in the block **Data storage** and color coded according to the colors of the corresponding tabs. You can delete and download files on this page and install uploaded settings or firmware files on the page **Global**.

11.8 Log

Event Log

The event log is a record of significant system events, such as system restarts and error messages, which are crucial for monitoring the performance of the device. These events have an alarm priority and may require immediate attention or action to resolve issues or ensure proper operation (see also 10.18 Setting Up Alarms).

Event Log		Extended Log volatile	
Filter: Example: Cold Start OK		Operations: '&' for AND, ' ' for OR States: OK, FAIL	
		Auto Refresh ☒ Download Clear	
No	Time	Priority	State- Message
887	2023-09-07 11:06:03	Informational	Successful login as Admin from 192.168.96.90
886	2023-09-06 13:15:14	Informational	Successful login as Admin from 192.168.99.120
885	2023-09-06 08:16:55	Informational	Successful login as Admin from 192.168.99.120
884	2023-09-05 14:07:24	Informational	Successful login as Admin from 192.168.96.90
883	2023-09-05 12:40:30	Informational	BNC Input 1: Silence Detection (Ref: 0.0, Level: 5.0 [dBu])
882	2023-09-05 12:40:02	Emergency	BNC Input 1: Silence Detection (Ref: 0.0, Level: -11.9 [dBu])

Extended Log

The extended log contains less critical information compared to the event log, and is primarily intended to provide insights into general events. The log entries in the extended log are informational and do not carry alarm priorities, they are volatile and do not persist over restarts.

Event Log		Extended Log volatile	
Filter: Example: RtpMissedPkt&SSRC:0x7ee9fcd		Operations: '&' for AND, ' ' for OR States: OK, FAIL	
		Auto Refresh ☒ Download	
No	Time	Source	Type - Message
54	2023-09-05 16:33:50	Default	RtpRxTimedOut RTP Rx stream timed out from IP 192.168.101.72:52238, SSRC:0x00000000
53	2023-09-05 16:00:09	Default	RtpUnrecoveredPkt RTP Rx 1 packet(s) unrecovered (eq. 3ms), 1st missed SEQ:36339
52	2023-09-05 16:00:09	Default	RtpMissedPkt RTP Rx 1 packet(s) missed, 1st missed SEQ:36339 (from 192.168.101.72:52238)
51	2023-09-05 15:21:27	Default	RtpRxStart Start RTP Rx from IP 192.168.101.72:52238, SSRC:0x00000000
50	2023-09-05 15:21:27	Default	RtpRxStart Start RTP Rx from IP , SSRC:0x65ebd7cc
49	2023-09-05 15:21:11	Default	RtpRxTimedOut RTP Rx stream timed out from IP 192.168.101.72:52238, SSRC:0x00000000
48	2023-09-05 15:21:00	Default	RtpRxStart Start RTP Rx from IP 192.168.101.72:52238, SSRC:0x00000000

Nettwork Log

The nettwork log is a record of events connected to nettwork, such as executed commands, file uploads and reception of new group membership information. The log displays the number of the event, the timestamp, the group that was involved and the message describing the event.

Event Log Extended Log volatile Nettwork Log			
Filter:		Operations: '&' for AND, ' ' for OR	
		Auto Refresh ☒	Download Clear
No	Time	Group	Message
401	2025-11-12 14:17:59	Flensburg	Command executed: "set:csl.device.sysSettings.devName":"MPX2DS-LiveFL"
400	2025-11-12 11:56:50	Flensburg	Command executed: "set:csl.device.sysSettings.devName":"MPX2DS-FL"
399	2025-11-12 11:39:43	AnyDevice	New group membership information received, groups:"Flensburg"
398	2025-11-12 11:37:37	Flensburg	Command executed: "set:csl.device.sysSettings.devName":"MPX2D-HH"
397	2025-11-12 11:26:49	AnyDevice	New group membership information received, groups:"NDR All, Flensburg"
396	2025-11-12 10:07:24	AnyDevice	Command executed: "set:csl.device.sysSettings.devName":"MPX2DS-LiveMC"
395	2025-11-10 09:48:44	AnyDevice	New group membership information received, groups:"LocalTestDevice"
394	2025-11-10 11:25:18	AnyDevice	Command executed: "set:csl.device.sysSettings.devName":"MPX2DS-LiveMC"

- To automatically refresh the page and immediately see new entries, toggle the switch **Auto Refresh**.
- To sort the log entries, click on the column header of the parameter by which you want to sort the entries. To reverse the order, click the same header again.
- To search for a specific entry, enter a term into the search bar.
- To save the list to a log file, click **Download**.
- To delete all log entries, click **Clear**. Confirm your decision in the dialog window.

11.9 Priority of Alarm Messages

In case of an alarm, an error report with the priority of the error will be sent to the Network Operations Center (NOC). The responsible second-level support will decide by means of this information how urgent the alarming case is and what measures are necessary. The event will be recorded in a log entry.

Priority	ID/Code	Definition
Emergency	0	System is unusable
Alert	1	Actions must be taken immediately
Critical	2	Critical condition
Error	3	Error condition
Warning	4	Warning condition
Notice	5	Normal but significant condition
Informational	6	Informative message
Debug	7	Debug-level message

12 Maintenance and Support

12.1 Maintenance and Disposal

No special maintenance is necessary on the device. Do not use corrosive detergents on the device such as benzene, thinner, alcohol or acetone.

Remove dust on the housing of the device with a soft, dry cloth.

Electrical appliances do not belong in domestic waste. Dispose of the device in an environmentally friendly manner via suitable collection systems in accordance with the local regulations.

12.2 Troubleshooting and Warranty

More often than not, it is only a small detail that has been overlooked and leads to a problem. Therefore, read the user manual carefully, as this will help you to understand, prevent and eliminate typical problems. Use the following table to self-check common error sources prior to contacting our support.

For information on the warranty of 2wcom products, visit <https://www.2wcom.com/terms-and-conditions/>.

Problem	Possible Causes	Solution
Device does not turn on	- Power cable is connected improperly - Mains supply failure - Blown fuse	- Check power supply cord. - Make sure that the power plug is fully inserted. - Check mains supply. - Replace fuse by same type.
Device is not accessible via Ethernet	- Network cable is not connected - IP address/TCP port is unknown - A device with the same IP address was connected a few minutes before. Thus, the ARP table still assigns the old MAC address to the IP address.	- Connect the network cable. - Check IP address obtained from DHCP via LCD menu. - The operation system refreshes the ARP table every few minutes. For instant access to the device, reset the ARP table of your computer, e.g. by entering <code>arp-d</code> in the Windows command prompt.
Device does not respond		- Reboot the device. - Update the software.

12.3 Support

The section **Support** is located in the lower left corner of the web interface. In this section you can check for updates, manuals and documents and access the 2wcom support center.

Alternatively, you can go to the [2wcom Download Center](#) to check for manuals, documents and firmware bundles of every 2wcom device.

12.3.1 Checking for Updates

You can check for updates and install them, if available. You can also view the release notes and details about the available updates. Additionally, it is possible to download the firmware file to install at a later point in time.

Alternatively, you can upload ARM firmware stored locally and activate it via the web interface or load a firmware file from a USB stick to update the firmware. For more information see 10.7 Updating the Firmware with a File.

To install an available update:

1. In the menu **Support**, click **Check for updates**.
 - The window **Available Firmware Versions** opens.
 2. Select the update you want to install.
 - The dialog window **Firmware Update** opens.
 3. Click **Yes, update now**. The update may take a while. Do not interrupt this process. Since the device reboots during this process, you will be logged out.
- ✓ The firmware is now updated.



In the window **Available Firmware Versions**, firmware bundles that are newer than the currently installed one are marked with ★. Important updates are marked with !. Click **Open** to view the change notes and details about a bundle version. To download a firmware bundle for later installation, click .



In the window **Available Firmware Versions**, you can enable an **automatic update check** every 24 hours. If a new update is available, it will be indicated by the ★ icon next to the **Check for Updates** menu item. You can also enable a notification dialog that informs you of any new updates.

12.3.2 Checking for manuals and documents

You can check which manuals and documents are available for your device.

To show the current version of the manual and other available documents:

1. Click on **Manuals / Documents** in the section **Support**.
 - The window **Manuals / Documents** opens.
 2. Choose a manual or document you want to view.
 - ① The list shows the language the document is written in, the name, date, version and type of the document.
 3. Click **Open** to open the manual or document.
- ✓ You have opened the current version of the manual or another document.

12.3.3 Accessing the support center

Report failures and request support via the 2wcom support center.

For a support request to 2wcom, please have the serial number of the device ready. You can find the serial number of your device on the page **Global** and on the sticker on the rear side of the device: "S/N xxx.xxxxxx".

To access the support center:

1. Click on **Support Center** in the section **Support**.
 - The page **Support** of the 2wcom website opens as a new browser tab.
 2. Click on **2wcom Support Center**.
 - The 2wcom support center opens as a new browser tab.
- ✓ You have accessed the 2wcom support center.

12.4 Manufacturer

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13 Technical Details

13.1 Specifications

13.1.1 Formats and Protocols

13.1.1.1 RDS Signal

Standards	UECP 7.05, CENELEC, EN 50067, IEC 62106, (RDS 2.0 ready)
Coding	Differential and biphase
Modulation	double-sideband amplitude modulation (DSSC) with suppressed carrier
Center frequency	57 kHz $\pm$ 6 Hz
Bandwidth	$\pm$ 2.4 kHz
RDS level	0 – 8191 mVpp
RDS phase offset	-180° – 180°
Linear distortion	< 0.5 dB between upper and lower sidebands
SNR	> 80 dB
Carrier suppression	> 85 dB

13.1.1.2 RDS Synchronization

Mode	Synchronized to external pilot or internal stereo encoder
Fallback	Automatic switchover to internal oscillator
Frequency	19 kHz $\pm$ 2 Hz
Level external	< 9 Vpp

13.1.1.3 RDS Features

RDS functions	PS, PI, TP, TA, PTY, PTYN, MS, DI, RT, CT, AF 64 lists, EON, EWS, ODA, TMC, TDC, IH, RP, PIN, SLC, LINKAGE, EPP, ECC, FFG, SPS
Data sets	16

13.1.1.4 Stereo MPX Signal

Channel separation	L/R > 70 dB at 1 kHz; L/R > 60 dB at 20 Hz – 15 kHz; M/S > 60 dB
Frequency response	20 Hz – 15 kHz < 0.15 dB
Pilot rejection	> 70 dB
SNR	> 80 dB
THD	< 0.05 %
Pilot frequency	19 kHz $\pm$ 1 Hz
Pilot magnitude	2.5 kHz – 10 kHz
Pilot phase	-5 – +5° in steps of 0.1° – adjustable to 38 kHz-subcarrier
Preemphasis	off, 50 μ s, 75 μ s
Limiter	Peak: 50 – 100 kHz; Power: -3 – +3 dBr according to BS.412-9

13.1.1.5 MPX

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

13.1.1.6 FM MPX Signal

Signal	FM MPX digital or analog
Frequency response	20 Hz – 90 kHz: < 0.05 dB
Stereo separation	> 55 dB
Harmonic distortion	< 0.0025 %
SNR (CCIR-weighted)	> 75 dB
SNR (A-weighted)	> 90 dB

13.1.1.7 μ MPX (optional)

Bitrates	320, 384, 448, 576, 800 kbit/s (without FEC) Note: 800 kbit/s only possible with μ MPX v4
Sample rates	192 kHz

13.1.1.8 FM μ MPX Signal

Signal	FM MPX digital or analog
Frequency response	40 Hz – 15 kHz: < 0.15 dB
Stereo separation	> 36 dB at 500 Hz > 50 dB
Harmonic distortion	> 56 dB or < 0.16 % at 500 Hz > 70 dB or < 0.035 %
SNR (CCIR-weighted)	> 69 dB
SNR (A-weighted)	> 78 dB

13.1.1.9 Audio (optional)

Codecs (included)	Linear PCM, G.711, G.722 Linear PCM (AES67) Opus, Ogg Vorbis MPEG 1/2 Layer 2, 3 MPEG-2/MPEG-4 AAC-LC, MPEG-4 HE-AAC v1 & v2, MPEG-4/MPEG-D xHE-AAC MPEG-4 AAC-LD/ELD/ELdv2 Enhanced aptX (E-aptX)
Bit depth	16, 20, 24 bit
Sample rates	16, 22.05, 24, 32, 44.1, 48, 132, 192 kHz

13.1.1.10 Streaming

IP protocols	TCP, UDP unicast, multiple unicast & multicast
Audio over IP formats (optional)	RTP (RFC 3550, RFC 3551, RFC 3640, RFC 2250) SMPTE ST 2110 (optional) MPEG-TS
Web streaming (optional)	Icecast/Shoutcast Client
Transmission robustness	SRT, RIST Pro-MPEG FEC #3 release 2 Dual Streaming µMPX FEC Adaptive bitrate switching, source switching concept, management of packet size, buffers, QoS

13.1.1.11 Synchronization

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

13.1.2 Interfaces

13.1.2.1 Audio/MPX

Digital (in)	2x AES/EBU, 110 Ω balanced integrated XLR female, shared with analog in (configurable) up to 192 kHz sampling rate for MPX
Digital (out)	2x AES/EBU, 110 Ω balanced integrated XLR male, shared with analog out (configurable) up to 192 kHz sampling rate for MPX
Analog (in)	1x L/R, > 10 k Ω balanced integrated XLR female, shared with digital in (configurable)
Analog (out)	1x L/R, < 20 Ω balanced integrated XLR male, shared with digital out (configurable)
Analog MPX (in)	2x integrated 50 Ω BNC socket
Analog MPX (out)	2x integrated 50 Ω BNC socket
Analog reference level	+6 dBu max. +18 dBu (input/output)
Digital reference level	-9 dBFS
Adjustable gain	20 – +6 dB
Harmonic distortion	< 0.05 % / < -66 dB (40 Hz – 10 kHz)
Dynamic range	16 Bit: > 89 dB; 24 Bit: > 130 dB
Frequency response	Depends on sample rate. For example: 48 kHz: 0.1 dB; 20 Hz – 22.5 kHz

13.1.2.2 Interface Extensions

FM/DAB/HD Radio® tuner (optional)	2x 75 Ω F-type
FM/DAB/HD Radio® tuner (optional)	50 Ω BNC socket
SAT tuner (optional)	2x 75 Ω F-type

13.1.2.3 Ethernet

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

13.1.2.4 Synchronization

1PPS input	50 Ω SMA socket
------------	------------------------

13.1.2.5 Serial and GPIO

DTE 1+2	2x 9 pole D-Sub male connector for serial RS-232C data communication
USB	USB 2.0 interface for service, configuration, and firmware updates
GPIO	26 pole D-Sub male; combined connector for inputs (GPI) and outputs (GPO)

13.1.2.6 Front Panel

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

13.1.3 General Data

13.1.3.1 Integrated Web GUI

Languages	English
Web technologies	HTML5, Java Script

13.1.3.2 Device

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

13.1.3.3 Power Supply

Standard AC	1x internal IEC power connector voltage range 90 – 260 VAC (nominal 100 – 240 VAC) frequency range 47 – 63 Hz (nominal 50 – 60 Hz)
Dual internal (optional)	2x internal redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz) DC: -40 – -60 VDC (nominal -48 VDC)
Dual hot-plug (optional)	2x hot-swappable redundant power supplies (AC or DC) automatic switchover and prioritization AC: 90 – 260 VAC (nominal 100 – 240 VAC), 47 – 63 Hz (nominal 50 – 60 Hz) DC: -40 – -60 VDC (nominal -48 VDC)

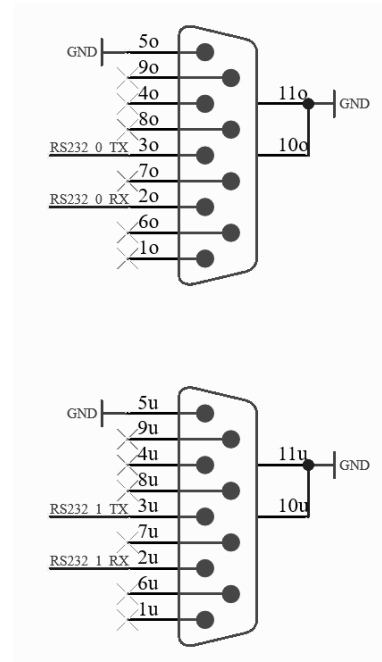
13.2 Interface Pin Layouts

13.2.1 DTE

The device features 2 9-pole D-Sub male interfaces for DTE data communication.

The pin layout for DTE is as follows:

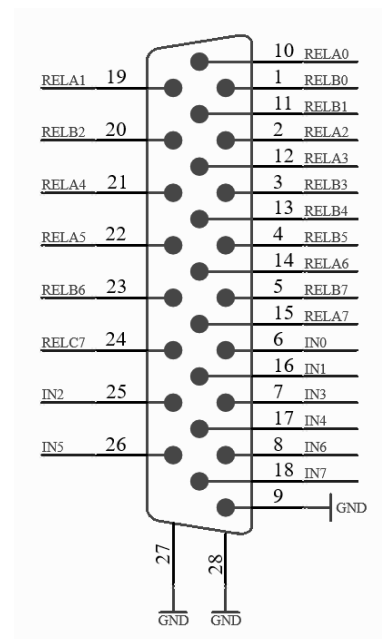
Sub-D	RS232
2o	0 RX
3o	0 TX
2u	1 RX
3u	1 TX



13.2.2 GPIO

The pin layout for GPI is as follows:

GPI No.	Sub-D pin name (pin no.)
1	IN0 (6)
2	IN1 (16)
3	IN2 (25)
4	IN3 (7)
5	IN4 (17)
6	IN5 (26)
7	IN6 (8)
8	IN7 (18)
—	GND (9)



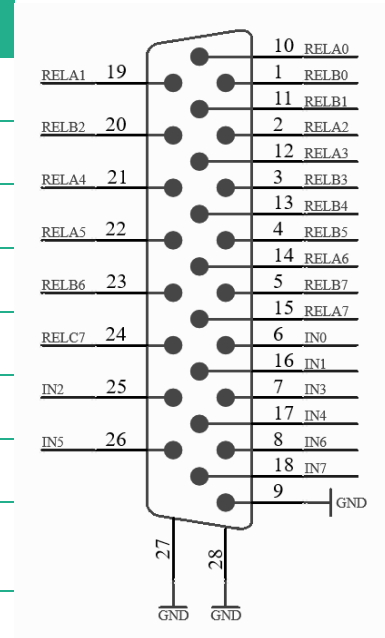
- To actuate a GPI, pull the corresponding control pin electrically to ground (pin 9). The resulting control current is less than 5 mA.

NOTICE Risk of equipment damage!

- The voltage on GPI contacts must not be negative or exceed +0.7 V.

The pin layout for **GPO** is as follows:

GPO No.	Sub-D pin name (pin no.)	Switch type
1	RELA0 (10), RELB0 (1)	SPST, NO 
2	RELA1 (19), RELB1 (11)	SPST, NO 
3	RELA2 (2), RELB2 (20)	SPST, NO 
4	RELA3 (12), RELB3 (3)	SPST, NO 
5	RELA4 (21), RELB4 (13)	SPST, NO 
6	RELA5 (22), RELB5 (4)	SPST, NO 
7	RELA6 (14), RELB6 (23)	SPST, NO 
8	RELA7 (15), RELB7 (5), RELC7 (24)	SPDT 
–	GND (9)	–



SPST: a simple on/off switch: single pole, single throw

SPDT: single pole, double throw

NO: normally open

NOTICE Risk of equipment damage!

- The relay contacts have a maximum load of 0.5 A at 30 V DC. Do not exceed these values.

13.3 Certificates and Declarations



EC declaration of conformity

The manufacturer

2wcom Systems GmbH
Am Sophienhof 8
24941 Flensburg
Germany

hereby confirms that the product:

MPX-1g

in its conception, construction and form put into circulation is in accordance with all the relevant essential health and safety requirements of the following EC/EU directives as amended and the national laws and regulations adopting these directives:

- | | |
|---|---------------------|
| • Audio/video, information and communication technology equipment – Part 1: Safety requirements | EN IEC 62368-1:2021 |
| • Electromagnetic Compatibility (EMC) Directive | 2014/30/EU |
| • Low Voltage (LVD) Directive | 2014/35/EU |
| • Radio Equipment Directive (RED) | 2014/53/EU |
| • Restriction of Hazardous Substances (RoHS 2) Directive | 2011/65/EU |

This EC-declaration of conformity is the result of a test, which was accomplished in accordance with the standards EN 301489-1:2020-06, EN 300422-1:2022-05, EN 300422-2:2017-07, EN 55011:2023-10, EN 55035:2022-06, EN 55032:2022-08, EN IEC 61000-3-2:2023-10, EN 61000-3-3:2023-02, EN 61000-4-2:2009-12, EN 61000-4-3:2021-11, EN 61000-4-4:2013-04, EN 61000-4-5:2021-04, EN 61000-4-6:2014-08, EN 61000-4-11:2021-10, EN 61000-4-16:2016-10, EN 63000:2019-05.

This declaration is no longer valid if the machine is modified without our consent.

2wcom Systems GmbH

September 3, 2026