

XtremeSat Media Content Receiver

MCR10x/20x

Professional DVB Satellite Receiver



User Manual

August 2012

Content

1.	Symbols in this manual	5
1.1.	Tags and their meaning	5
1.2.	Warning signs and their meaning	5
2.	Introduction	6
3.	Safety Instructions.....	9
4.	Supplied Parts	11
5.	Manufacturer.....	12
6.	Installation	13
6.1.	Best setup location	13
6.2.	Power supply	13
7.	First steps.....	14
7.1.	Power supply	14
7.2.	Network configuration.....	14
7.3.	Web interface	15
7.4.	Adjust volume levels.....	15
7.5.	Connect satellite antenna cable.....	15
7.6.	Tuning	16
7.7.	Configure input source for audio outputs	17
7.8.	Connect audio and/or data cables.....	18
7.9.	Use station presets.....	18
8.	Control elements and connectors	19
8.1.	Front Panel.....	19
8.2.	Rear Side	20
9.	Operation via Web Interface.....	21
10.	Audio and data processing flow	23
10.1.	Audio processing	23
10.1.1.	Primary inputs.....	23
10.1.2.	Secondary inputs.....	23
10.1.3.	Audio outputs.....	24
10.2.	Data processing	25
11.	Description of the web interface	26
11.1.	System: system information page	26
11.2.	Input Source	27
11.2.1.	Audio Output 1	28

11.2.1.1.	Main source settings	28
11.2.1.2.	Backup source settings	37
11.2.1.3.	Activate Monitoring Function.....	40
11.2.2.	Audio Output 2.....	40
11.2.3.	Switch Criteria.....	41
11.2.3.1.	Switch Criteria for SAT Tuner.....	41
11.2.3.2.	Switch criteria for Audio over IP (Icecast)	43
11.2.3.3.	Switch criteria for Internal Storage.....	43
11.3.	Interface Settings.....	44
11.3.1.	XLR: configuration of audio level and 15kHz low pass filter	44
11.3.2.	Headphone: adjusting headphone audio volume	44
11.3.3.	DTE: configuration of the serial RS-232 interfaces	45
11.3.4.	Relay: relay configuration	45
11.3.5.	Optical Coupler: optical coupler configuration.....	47
11.4.	Network Settings.....	47
11.4.1.	TCP/IP: configuration of the Control Interface (10/100).....	47
11.4.2.	SNTP: date and time setup	48
11.4.3.	SNMP: SNMP configuration	49
11.4.4.	FTP.....	51
11.5.	System Settings.....	52
11.5.1.	Global settings: device parameters and settings	52
11.5.1.1.	System parameter – device identification	52
11.5.1.2.	System information	52
11.5.1.3.	Upload Settings – restore device settings	53
11.5.1.4.	Firmware Update.....	53
11.5.1.5.	Download Settings	53
11.5.1.6.	Reboot and Factory Settings.....	54
11.5.2.	Time: date and time setup.....	54
11.5.3.	User.....	55
11.5.4.	Preset station preset configuration, activation, and copying	55
11.5.5.	Alarm.....	55
11.5.5.1.	Alarm Settings: Tuner (TS)	56
11.5.5.2.	Alarm Settings: Demuxed Data.....	58
11.5.5.3.	Audio over IP (Icecast)	59
11.5.5.4.	Audio silence detection	60

11.5.5.5. Case temperature	60
11.5.6. Remote Control	61
11.5.7. Crossfading.....	63
11.6. Status.....	65
11.6.1. SAT Tuner – Tuner Status.....	65
11.6.2. TS: display transport stream status	66
11.6.3. Audio: display MPEG status.....	66
11.6.4. RDS Data	66
11.6.5. FTP: External FTP server status	67
11.6.6. Scheduler	67
11.6.7. Error Log	69
12. Interfaces	70
12.1. RF Inputs	70
12.2. Audio Outputs.....	70
12.3. Ethernet Sockets.....	71
12.4. Optical Coupler Input.....	71
12.5. Relay Output	72
12.6. Relay Output controlled by QBIT Q561 inputs	74
13. Maintenance & Servicing.....	75
14. Troubleshooting.....	76

1. Symbols in this manual

1.1. Tags and their meaning

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



Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE

Describes precautions necessary to protect the equipment.



NOTE: Useful information for the user.

1.2. Warning signs and their meaning

The following warning signals are used in this user manual:



Warning of general danger location



Warning of electric shock



Warning of hot surface



Warning of fire hazard

2. Introduction

XtremeSat Media receiver MCR is a professional satellite receiver, developed by 2wcom Systems and Clear channel, for the reception of a MPEG2 transport stream via DVB-S/DVB-S2 Tuner, Ethernet interface and audio files uploaded to the Internal Storage for regional sport insertion or recording for delayed playback as well as decoding of included audio signals and auxiliary data. It receives the IF (L-band) output of a satellite receiving LNB with a frequency range of 950...2150 MHz. The received audio streams and data streams can be output on several different digital and analog interfaces.

MCR is available in different variants with varying functions: MCR101, MCR102, MCR201 and MCR202.

The last figure **"1"** in the variants MCR10**1** and MCR20**1** means that these devices are equipped only with **one** audio output (Audio Output 1).

The last figure **"2"** in the variants MCR10**2** and MCR20**2** means that these devices are equipped with **two** audio outputs.

The "Advanced" variants MCR**201** and MCR**202** (short: MCR**20x**), in contrast to "Basic" MCR**10x**, are supplied by the function "Scheduler" and by an Internal Storage.

The basic functionality of MCR10x and MCR20x is shown in the following table:

	Feature List / Model	MCR10x	MCR20x
Standard	Tuner module with DVB-S2 and low symbol rates (min 100k)	✓	✓
	Audio Input: UDP or UDP/RTP audio streaming input on 1000Base-T interface as alternate audio channel source		
	Audio Input: IP audio input on 10/100Base-T interface using an Icecast ¹ Server (backup audio)	✓	✓
	Headphone output	✓	✓
	2 x serial output for RDS	✓	✓
	XLR AES/EBU audio interface group (Analog L, Analog R and Digital)	✓	✓
	Audio decoding: MP2/4/AAC-LC/ AAC+ HE v1 & v2	✓	✓
	15 kHz low pass filter	✓	✓
	Adjustable audio delay	✓	✓
	10/100Base-T interface (control/monitoring)	✓	✓

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

1000Base-T interface (data)		
Display and jog dial		
Web interface (10/100Base-T interface)	✓	✓
SNMPv2c	✓	✓
SD Card for audio file storage (advertising and backup audio)		✓
Advanced Advertisement (Integrated Add Manager): Scheduler functionality, playback and upload of audio files and playlists via In-Band Remote Control and via FTP, Report management ...		✓
RDS/UECP decoder in web interface	✓	✓

Optional functionality is also available:

Options	Feature List / Model	MCR10x	MCR20x	
	Transport stream input			
	Tuner module with DVB-S2, 16APSK & 32APSK and advanced functionality (VCM/ACM, multi stream, ...)	✓	✓	
	DVB-ASI			
	Transport stream input over 1000Base-T interface			
	Transport stream output			
	DVB-ASI			
	Transport stream output over 1000Base-T interface			
	Audio output			
	second XLR AES/EBU audio interface group (Analog L, Analog R and Digital)	✓ ²	✓ ³	
	Data output			
	2 additional RS232 outputs			
	Low speed IP data output (i.e. RDS, DRM)	✓	✓	
	High speed IP data output (MPE IP data)			
	Monitoring			
	IP audio streaming server for monitoring	✓	✓	
	Remote Control			
	Control via satellite carrier (i.e. relay switching, firmware update, etc.)	✓	✓	

² Only in MCR102

³ Only in MCR202

	Hardware		
	DVB Common Interface (DVB-CI)		
	Additional relay outputs		
	Demultiplexing		
	MPE demux: IP data output of demultiplexed MPE data (IP datagrams) over 1000BASE-T interface		

Important notice



NOTE: Read this user manual carefully before attempting to operate the XtremeSat MCR. Save this user manual for future reference – it contains important safety and operating instructions for the device.

Further notices



NOTE: The graphics of the manual may differ from the supplied model or the actual appearance. Configurations, functions and specifications can be changed without prior notice. This manual does not cover basics about the transmission of audio and auxiliary data via DVB-S/DVB-S2/, nor does it cover basics about the usage of web browsers or IP networks. Thus, relating basic knowledge is required. Some functions described may not be applicable to the device ordered.

If you require further assistance please contact our support team.

3. Safety Instructions

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

WARNING

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

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

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

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

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

Keep the device away from unauthorized persons.

DANGER



DANGER of electrical shock

Plug the device into a grounded power socket only. Never remove the grounding wire/contact.

Never open the housing of the device by yourself. Never touch open electrical parts.

Dangerously high voltages are present inside the housing. Even after disconnecting the mains supply, dangerously high voltage levels may be present for a certain time.

Do not touch the device with wet hands.

Never expose the device to liquids. If any liquid comes inside the housing, immediately disconnect the device completely from the power supply. Do not continue operating the device.



FIRE HAZARD of overheating or electric shock

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

- non-ventilated environment, for example a narrow shelve or built-in wardrobe;
 - extremely warm or cold place;
 - direct sunlight exposure;
 - too high or too low temperature;
 - extremely wet or dusty environment.
- Do not operate the device in the presence of flammable gases.

	<p>Do not cover the ventilation openings of the device to avoid heat accumulation.</p> <p>Do not put objects with open flames such as burning candles on the device.</p> <p>Do not put heavy objects on the supply cord. A damaged cord can lead to fire or electric shock hazards.</p> <p>To disconnect the supply cord, drag always the plug and never the cable to avoid the cord damage.</p>
--	--

⚠ WARNING



WARNING of explosive atmosphere

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



WARNING of hot surface

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

Do not touch the surface of the device during operation.

NOTICE

CAUTION: Risk of equipment damage

Before the first operation:

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

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

All damaged components must be replaced immediately.

Installation:

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

If necessary, another than the supplied supply cord has to be used, in compliance with the regulations of the country where the device is operated.

Make sure that the AC power outlet is next to the device and readily accessible to the user.

Installation of other devices:

External devices which are connected to the device could be damaged by the device or damage the device itself, if the output levels exceed the specified limits.

Cleaning:

Do not use corrosive detergents on the device such as benzine, thinner, alcohol or acetone. Clean the surface of the device only with a soft dry cloth.

4. Supplied Parts

- MCR
- Power supply cord
- Patch cable
- CD with supplementing data (SNMP MIB files, handbook as PDF)



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

5. Manufacturer

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

contact@2wcom.com • www.2wcom.com

© 2012 • 2wcom and the 2wcom logo are registered trademarks of 2wcom in Germany and other countries.

6. Installation

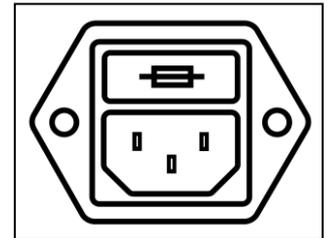
6.1. Best setup location

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

6.2. Power supply

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

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



⚠ WARNING



WARNING

Disconnect mains power plug before you open the housing.

Repair of the equipment must only be carried out by authorized and qualified personnel.

Read also the precautions on page 9 !

7. First steps

The following section contains instructions for quick start.

- ✓ You have already unpacked and installed the device in an appropriate place (see section 6.1).

7.1. Power supply

NOTICE

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

If the device is compatible, connect the power supply cord fully to the IEC power connector at the back panel of the device and a mains power outlet.

⇒ The "Power" LED will then turn on.

7.2. Network configuration

For delivery the device is configured with default settings for the first connection via the IP interface.

The default IP address / network mask of the 10/100-Base-T interface is "192.168.14.250" / "255.255.255.0".

To configure the IP settings, if these setting were changed but not documented and so you cannot access the web interface of the device:

1. Connect the "DTE Front" interface of the device with an RS-232 cross-over / null modem cable to an RS-232 interface of a computer.
2. Open a terminal software (e.g. Microsoft HyperTerminal).
3. Make a connect with the "DTE Front" baud rate as configured in the device (default: 9600 baud) and the parameter 8N1.
4. Use the following commands to setup the IP parameter: "set ipaddress=", "set gateway=", "set netmask=" (each without spaces and supplemented with the IP address to be set).
5. Enter `reboot` and hit <ENTER> to save the changes.

Example: "set ipaddress=192.168.14.250", set netmask=255.255.255.0", then `reboot`.

MCP is equipped with DHCP (Dynamic Host Configuration Protocol) which enables the device to get an IP Address automatically. You can configure this option via "DTE Front" or web interface **Network Settings**→**TCP/IP** (see section 11.4.1).

⇒ Your device is now connected to network.

7.3. Web interface

The device can be fully operated with an internet browser via the integrated web interface. To operate the device via the web interface:

1. Use a computer that is connected to the same IP network that the MCR device is connected to.
2. Start an internet browser (e.g. Firefox/Mozilla ≥ Version 3.0 or Microsoft Internet Explorer ≥ Version 7.0 (both with Java Script activated)).
3. Enter the configured IP address in the address bar of the browser. If the IP address has not been changed in step 7.2, please enter the default address in the address bar of the browser: 192.168.14.250.
4. A login screen with *Username/Password* appears. Use the default accounts:
 - for a read-only access use "guest"/"guest"
 - for a full access use "admin"/"admin"

⇒ After entering the correct login data (case sensitive), the main MCR page appears.



NOTE: Change the login data as soon as possible to avoid unauthorized access to the device and document the login data in a safe place.

7.4. Adjust volume levels

1. Select **Interface Settings**→**XLR** or →**Headphone** in the web interface menu.
2. Configure the audio volume for the XLR outputs and the headphone output.

7.5. Connect satellite antenna cable

1. Connect the antenna cable that has a connection to the receiving LNB of the satellite antenna to the RF-IN F-type jack.
2. (Only for tuner option 16PSK): Connect another antenna cable that has a connection to the second receiving LNB of the satellite antenna to the RF-IN F-type jack.



NOTE: A well aligned satellite antenna is required for signal reception.

7.6. Tuning

To activate and to configure the tuner for each audio output:

1. Select **Input Source**→**Audio Output 1/Audio Output 2** in the web interface menu. The dialog box *Input Source for Audio Output 1/2* appears.

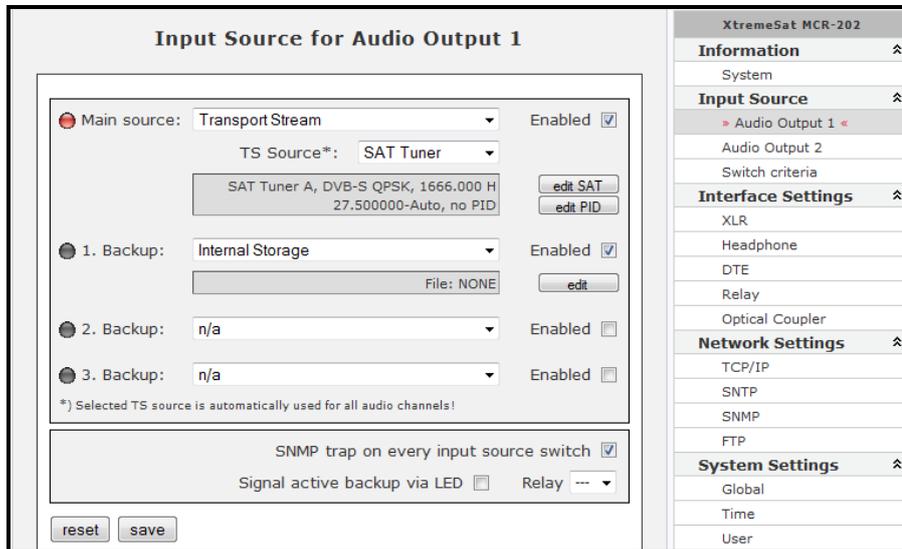


Fig. 1: MCR web interface: Audio Output 1/Audio Output 2 – Settings.

- Activate the **Main source** by ticking **Enabled**.
 - Choose “Transport Stream” in the dropdown list **Main source**.
 - Choose “SAT Tuner” in the dropdown list **TS Source**.
2. Open the dialog box *SAT Tuner settings–Main Source* by clicking the button.
 3. Configure satellite transponder signal reception:
 - Modulation type;
 - L-band (LNB IF) tuner frequency: LO frequency, LO e.g. 9.75GHz for lower band and 10.6GHz for upper band on universal LNBS;
 - symbol rate;
 - TS ID: only if symbol rate <1 MSym/s;
 - Polarization;
 - Frequency Range (22 kHz) signal;
 - Viterbi function (FEC).

EXAMPLE A: (satellite antenna is aligned to Astra 19.2° east):

Modulation:	DVB-S QPSK
L-band frequency:	2032 MHz,
Symbol rate:	22 MSym/s
Polarization:	horizontal
22 kHz:	on
Viterbi:	5/6 or Auto

4. Click on the button to save the changes.

⇒ The virtual "RF"-LED in the upper right corner and the real "RF"-LED (green color) of the device turns on to indicate the reception of a signal.

7.7. Configure input source for audio outputs

For manual or automatic configuration via SID (Service ID) of the PID settings that are necessary for decoding:

1. Select **Input Source**→**Audio Output 1/Audio Output 2** in the web interface menu. The dialog box *Input Source for Audio Output 1/2* appears (see Fig. 1).
2. Make sure that the **Main source** is activated in the box **Enabled**.
3. Open the dialog box *Demux – Audio Output 1/2* by clicking the button.
4. If you select the mode "PID (manual)", use the buttons to configure the processing (audio channel, audio decoding, data retrieval) of up to 3 PIDs out of the received transport stream.
5. If you select the mode "PID (manual)", use the buttons to configure the processing (audio decoding, data retrieval) of up to 8 PIDs out of the received transport stream.

EXAMPLE A: PID mode, configure the first three PIDs (only the listed functions are active):

Name: PCR1; PID Number:1035; Audio 1 Synchronisation: PCR1.

Name: AUDIO1; PID Number:1036; Output activated: Audio 1; , Delay: 10 ms.

Name: DATA1; PID Number:1037; DTE1: Data source - Private Data, Parameter: ES.

6. Click on the button to save the changes.

For more information about input source settings for different outputs see section 11.2

7.8. Connect audio and/or data cables

1. Make the connections to the output interfaces on the back panel of the device to use the signals as configured at step 7.7 (Digital Audio: AES/EBU 1; Analog Audio: Analog L-1 and Analog R-1, Analog Audio: Headphone; Data: DTE1).
2. With the outputs 1 and outputs 2 (Analog L/R + Digital) it is possible to output up to two individual audio signals (PIDs) of a single transponder signal simultaneously.



NOTE: The second audio interface group is only available with hardware option second XLR AES/EBU audio interface group enabled.

7.9. Use station presets

All previous settings 7.2-7.7 are automatically stored in the active preset.

To configure another station (see Fig. 2):

1. Select **System Settings**→**Preset** in the web interface menu.
2. Select the next unused preset memory.
3. Use "Preset name" to define a name for the active preset.

⇒ Save changes by clicking and you're done! MCR is ready to be used.



NOTE: These first steps are only intended for a quick first start and do not cover all device functions. Please read carefully the entire manual to be able to use all functions of the device.

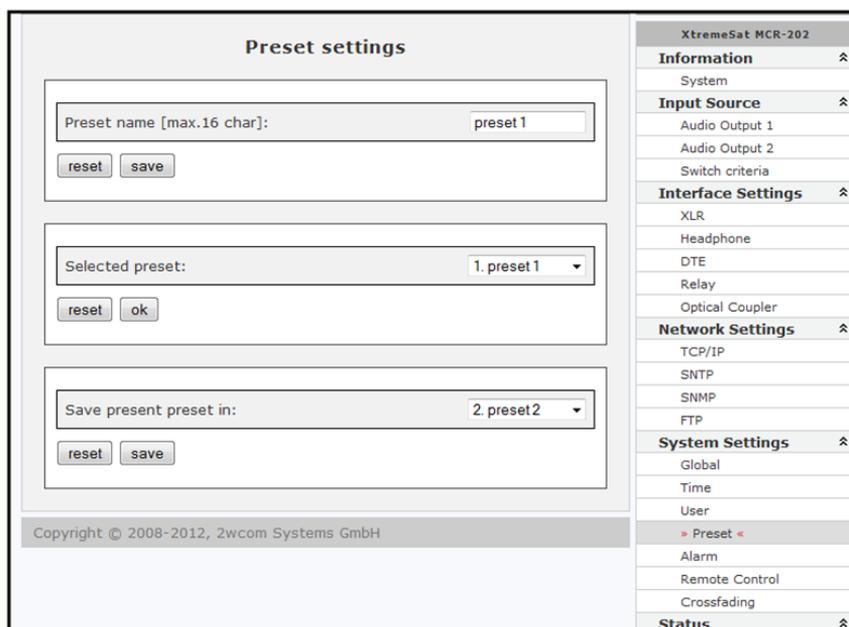


Fig. 2: MCR web interface: Preset memory settings.

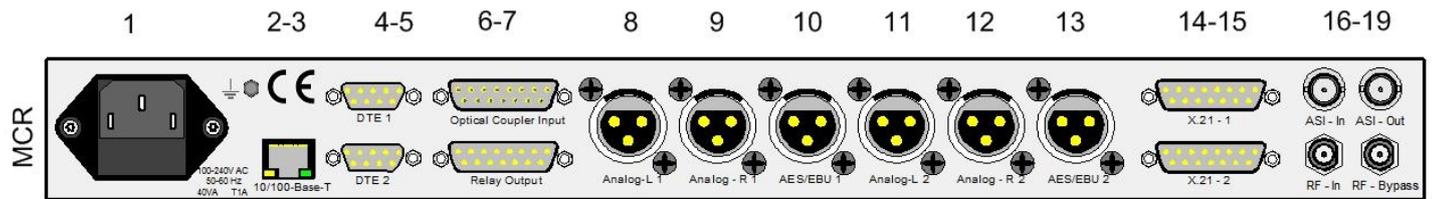
8. Control elements and connectors

8.1. Front Panel



- | | | |
|----|--|--|
| 1 | Headphones | 6.3 mm / 1/4" socket for the connection of headphones. The device can be configured to output the received audio data on this output. |
| 2 | [DTE Front] | 9 pole D-Sub male connector; only for device servicing purposes. |
| 3 | LCD screen | Display (LCD) is not available in MCR. |
| 4 | [Power] LED | Activated (green color) if the power supply is ok. |
| 5 | [RF] LED | Activated (green color) if the receiver detects a signal that can be decoded. |
| 6 | [Audio] LED | Activated (green color) if the receiver detects audio data that can be decoded. |
| 7 | [Data] LED | Activated (green color) if a data monitoring is activated for the DTE1 interface and data on this interface is detected. |
| 8 | [Warning] LED | Flashes (red color) if the monitoring function detected the triggering of a configured alarm. |
| 9 | [Status] LED | No function |
| 10 | [Remote] LED | No function |
| 11 | LED | LED to the right side of the DATA LED. Activated (green color) if a data monitoring is activated for the DTE2 interface and data on this interface is detected. |
| 12 |  button | Recessed  button for resetting the device in the case of malfunction. To activate the protected button, please use a metal pin or an unbent paper clip. |
| 13 | Jog dial | Jog dial is not available in MCR. |

8.2. Rear Side



- | | | |
|---|----------------------------|---|
| 1 | IEC power supply connector | Standardized IEC supply connector with integrated fuse holder.
Fuse ratings depending on mains supply voltage:
100-120V: T1.6A, time lag type, 5x20 mm, 250 V
220-240V: T1A, time lag type, 5x20 mm, 250 V |
| 2 | [Grounding stud] | The stud can be used to connect a grounding system if necessary.
Note that the required protection earth (PE) is accomplished via the 3-wire mains supply cord. |



NOTE: Die Schutzterdung des Gehäuses erfolgt bereits über den PE-Leiter der dreipoligen Stromnetzleitung.

- | | | |
|-------|-------------------------|--|
| 3 | [10/100-Base-T] | RJ-45 connector for control and monitoring the device via Ethernet. The device can communicate with the IP network and can be configured with an internet browser via the integrated web interface. The LED's at the socket show the link status (green; active if a physical network connection exists) and the activity status (yellow, active if data communication is active). |
| 4-5 | [DTE 1/2] | 9 pole D-Sub male connector for the serial RS-232 data communication, e.g. the output of application data of the received signal. |
| 6 | [Optical Coupler Input] | 15 pole D-Sub female connector; no function |
| 7 | [Relay Output] | 15 pole D-Sub male connector; Switch contacts of the integrated relays. The relays can be activated by the monitoring function in case of an alarm. |
| 8-9 | [Analog-L1/R1] | XLR male socket; Output of the left/right channel of the analog output number 1 with configurable signal level. |
| 10 | [AES/EBU 1] | XLR male socket; AES/EBU interface for the output of the digital audio signal number 1 in the "Professional Format". The sample rate of the signal depends on the received signal. |
| 11-12 | [Analog-L2/R2] | (Optional) XLR male socket; Output of the left/right channel of the analog output number 2 with configurable signal level.. |
| 13 | [AES/EBU 2] | (Optional) XLR male socket; AES/EBU interface for the output of the digital audio signal number 2 in the "Professional Format". The sample rate of the signal depends on the received signal. |
| 14-15 | [X.21-1] | not available in MCR. |
| 16 | [ASI-In] | not available in MCR. |
| 17 | [RF-In] | F-type jack; Input for the connection to the receiving LNB of the satellite antenna (IF: 950 MHz...2150 MHz, L-band). |
| 18 | [ASI-Out] | is not available in MCR. |
| 19 | [RF-Bypass] | F-type socket; no function |

9. Operation via Web Interface

The device has an integrated web interface. All configurations and operations can be made using a web browser.

To control MCR via web interface:

1. **Connection:** connect the Ethernet (10/100Base-T) port of the device and of the computer with installed internet browser to your existing IP network. See also sections 7.2-7.3.
2. **Browser:** use the web browser Firefox/Mozilla Mozilla \geq Version 3.0 or MS Internet Explorer \geq Version 7.0. Activate java-script within the browser.
3. **IP address:** enter the IP address of the device in the address bar of the browser. Upon delivery the default IP address is 192.168.14.250 and the network mask is on 255.255.255.0. To find the IP address of the device, see section 7.2).
4. **Access:** the device is protected by *username / password* against unauthorized access.
 - Upon delivery the read-only account is predefined to username: 'guest' and password: 'guest' (without the apostrophes).
 - For full-access it is 'admin/'admin'.

⇒ After the correct log-in (case sensitive) you can see the main page of the MCR web interface.



NOTE: to prevent unauthorized access and to document these data in a safe place, change the access accounts to individual *username / password*. To change the access data, select **System Settings**→**User**.

To maintain security, you are automatically logged-out after 15 minutes of no activity.

5. **Navigation:** to navigate through the web interface, use only the menu buttons of the web interface and not those of the web browser (i.e. forward and back).
6. **Buttons:**
 - if you want to save any changes made in the configuration of the device, press the button ;
 - if you don't want to save the changes, press the button in the input fields of the web interface. Saved changes cannot be reset by this button to a default.



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

7. **Numbers:** use a decimal point as the decimal separator in numbers in the input fields (i.e. "6.5" for six and a half).
8. **Input fields:** After entering a number or text in an input field, you must click on the corresponding or button to activate the changes. Alternatively you can use the ENTER-key of your computer keyboard.

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

10. Audio and data processing flow

The following pages will describe audio and data processing flows for the MCR devices. The MCRs data flow is straight forward, as there is only one input (the DVB-S/S2 tuner) and central audio and data processing.

10.1. Audio processing

MCR has two audio channels that each feed into dedicated analog and digital audio outputs or stream the raw audio data via IP network. Each channel can be fed from different primary and secondary (fallback) inputs.

10.1.1. Primary inputs

For the MCR there is only one input, the DVB-S/S2 tuner (see Fig. 3).

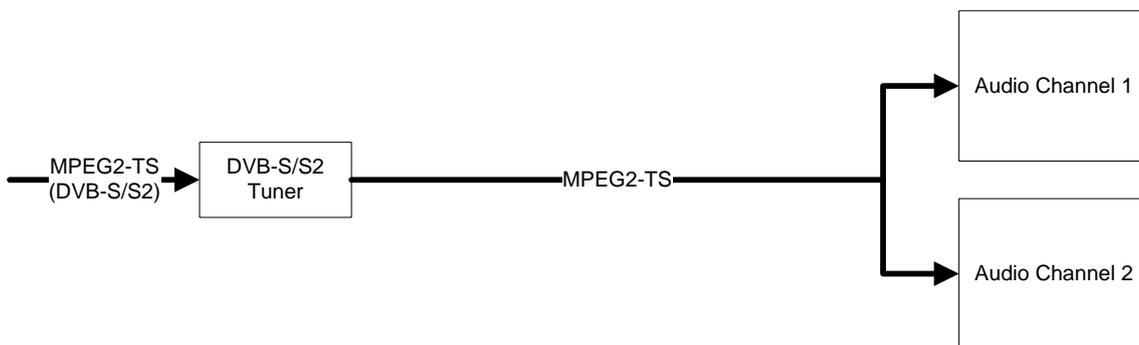


Fig. 3: Data processing flow via the primary input DVB-S/S2 Tuner in MCR.

Audio channels share the same MPEG2 TS input however, thus audio channel 2 has to use the same MPEG2-TS source as does channel 1.

10.1.2. Secondary inputs

There are scenarios where the need arises to fall back to an alternate input, for example bad or no satellite reception due to weather conditions. In this case, the MCR can be configured to use a fallback audio source, or secondary input. Secondary inputs are either audio files stored on an internal SD card or audio streams from an Icecast server in the local network or the internet (see Fig. 4). The MCR's alarm system can be used to configure the device for cases when secondary inputs should be used and when the receiver should return to normal operation.

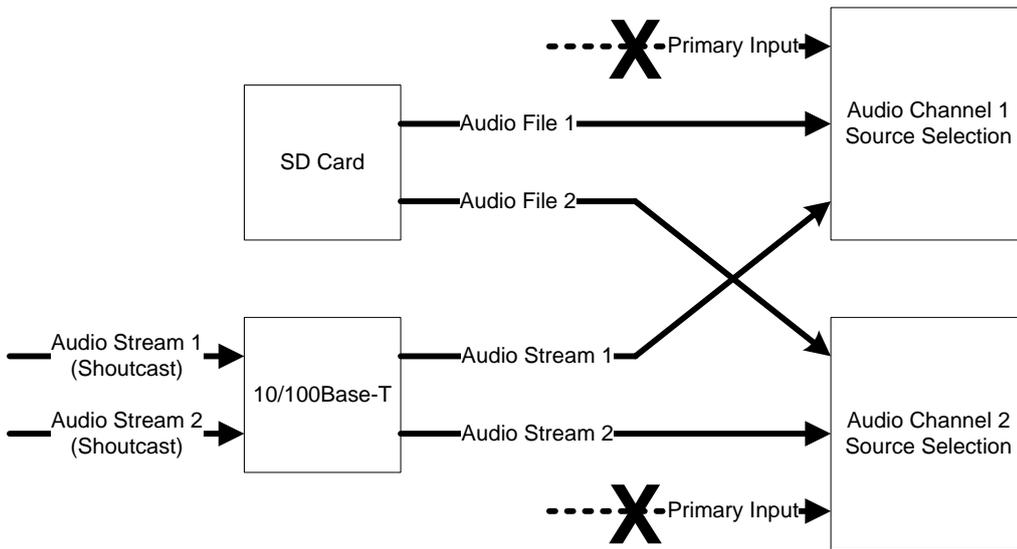
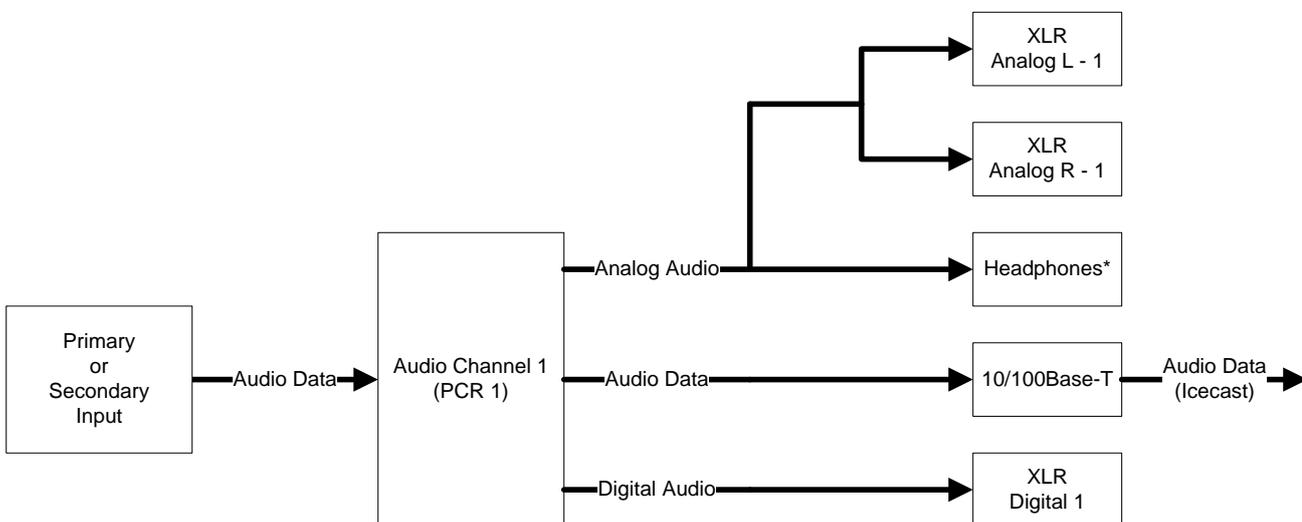


Fig. 4: Processing of the fallback data via the secondary inputs in the MCR.

10.1.3. Audio outputs

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



*Headphones can only be used by one audio channel at a time

Fig. 5: Possible outputs for audio data in one audio channel in the MCR.

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

10.2. Data processing

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

There is one typical scenario for data processing in the MCR: control or other data being transported in private or ancillary data sections in the MPEG2 TS, i.e. RDS data for radio transmission or satellite in-band control data to control, among other things, relays (see Fig. 6).

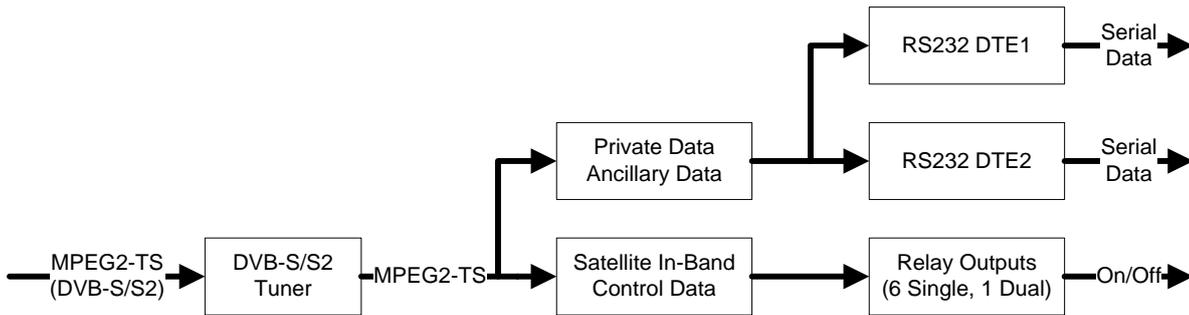


Fig. 6: Data processing in the MCR.

11. Description of the web interface

The following pages will describe all of the menu items of the web interface. Depending on the device configuration ordered, certain menu items might not be visible to the user. Menu items that depend on hardware or software options have references to the option. A complete list of available options can be found on page 6.



NOTE: The web interface of the device is dynamic, i.e. menu options are variable and can be hidden, depending on individual settings and activated options.

11.1. System: system information page

1. **Device identification:** In this field you can see the device name, location and description. You can change these parameters under **System Settings→Global**.
2. **Input Sources:** In this field you can see which input sources are currently active for the different outputs plus the settings and status for these inputs: the currently active input sources, audio codec, bit rate and sample rate (see Fig. 7).

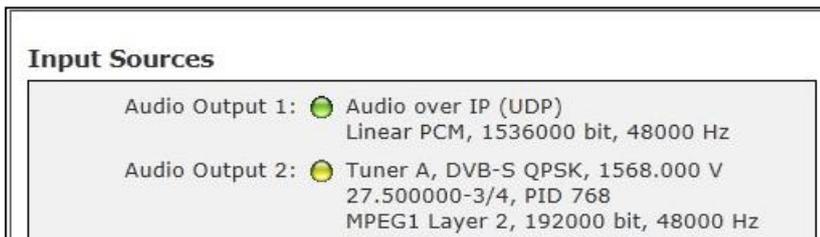


Fig. 7: System information page: the currently active input sources.

The color of the status LEDs will signal the following:

- - the main input source is active, everything OK
- - one of the backup sources is active; the state of the backup source is OK
- - input source failure; no available backup source

In case of tuner input the status page will also show the relevant tuner settings. You can change these parameters for each output in the main menu item **"Input Source"**.

3. **Audio Levels:** In this field you can see the audio levels of the two audio outputs. You can change volume levels for each output in the main menu item **Interface Settings→XLR** (see section 7.4).

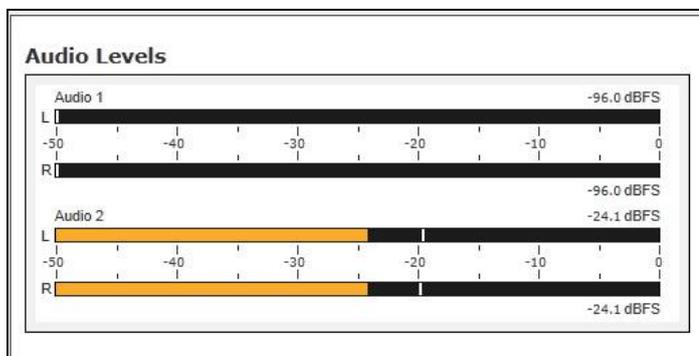


Fig. 8: System information page: Audio Levels.

4. **Tuner State:** In this field you can find the reception information. In case of the reception of a valid DVB-S/S2 signal, network ID (**NID**), tuner state (**State**) and signal bit error rate (**BER**) are shown here. The bar graphs underneath this block represent the channel to noise ratio (**C/N (dB)**) and level of the received signal.
5. **Device run time:** In this field you can find the device run time and date of last system startup.



NOTE: This menu shows only the status of parameters, outputs and inputs, only if they are activated.

11.2. Input Source

In this menu item you can activate and configure input sources for the different outputs (see Fig. 9). The settings for the audio input sources can be centrally controlled via this one separate menu option under **Input Source**→**Audio Output 1** or **Input Source**→**Audio Output 2**.

For each input source you can activate and configure one main source which serves as a primary input and several backup (secondary) input sources which should replace the original audio source when the original source does not work properly. If backup sources are enabled and configured, they will be automatically switched to in the order they are listed in the menu, also when the previous backup source fail. As soon as the primary input or the previous backup source is reestablished, the system switches automatically back to it. The criteria for switching to the alternative source (e.g. delay time and quality of the signal) and back to the main source can be configured manually via the same menu option under **Input Source**→**Switch criteria**.

11.2.1. Audio Output 1

This menu item is available under **Input Source**→**Audio Output 1** and is used to set up the primary as well as 3 secondary (backup) input sources for Audio Output 1.

The following sections describe these configuration options.

11.2.1.1. Main source settings

To activate and to set up the main input source for Audio Output 1 use the following menu options:

1. Activate the **Main source** by ticking the box **Enabled**.
2. Choose one of the following input source options in the dropdown list **Main source**:
 - [Transport Stream as a main input source](#)
 - [Audio over IP \(Icecast\). 1. Server as a main input source](#)
 - [Internal Storage as a main input source](#) (only MCR20x)
 - n/a – not available

11.2.1.1.1. Transport Stream as an input source

If you choose “Transport Stream” as a main input source for Audio Output 1 and want to set up this input, you can select only SAT Tuner in the dropdown list **TS Source**.

To set up SNMP monitoring functions for Transport Stream see section 11.2.1.3.

If you choose „SAT Tuner” as an input source for the transport stream, the following menu will appear:

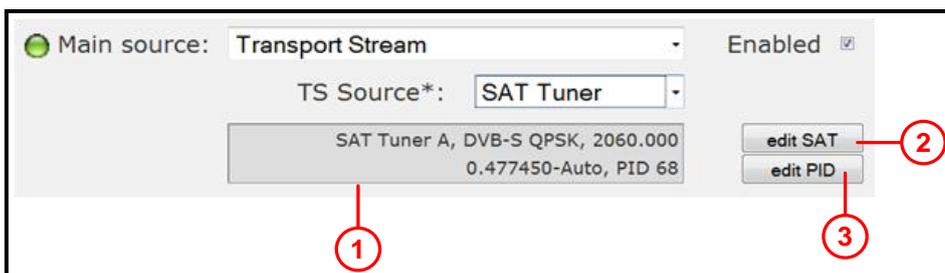


Fig. 10: TS Source for Audio Output: SAT Tuner.

(1) – Current setting of the SAT Tuner

(2) – Satellite Tuner Settings

(3) – Configuration of the individual PIDs containing MPE data to be processed

In this menu you can:

- [set up tuner by clicking](#)  (2)

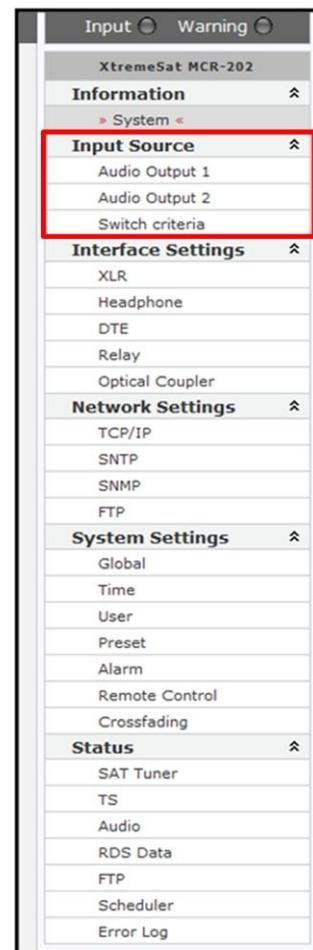


Fig. 9: Input source settings menu.

- [set up PIDs by clicking](#) (3)

Set up SAT Tuner Input

This menu item is used to configure all necessary parameters for satellite signal reception.

To open the tuner settings:

1. Select **Input-Source**→**Audio Output 1**.
2. Choose **Transport Stream** as a main input source.
3. Choose **SAT Tuner** as a TS Source.
4. Click the button (see Fig. 10 (2)).

⇒ The window *SAT Tuner Settings – Main Source* appears (see Fig. 11).

SAT Tuner settings
Main Source

Tuner A | Tuner B

Modulation: DVB-S QPSK
Frequency L-Band [950-2150 MHz]: 1314.000
Symbol rate: 27.500000
TS ID*: 0
Roll-Off: 35
Polarization: Horizontal
Frequency Range (22 kHz): High Band
FEC: Auto

*) only if symbol rate < 1 MSym/s

Active Tuner: Tuner A

reset save

Fig. 11: SAT Tuner settings for TS.

To set up the SAT Tuner for MPEG-TS, enter the following data in the menu fields:

Tuner A/B:	Choose between Tuner A and Tuner B on twin tuner boards. (This menu item is only available when device is equipped with a 16APSK tuner board).
Activation:	Activate or deactivate tuner in the bottom field by choosing the tuner in the dropdown list (see red box in Fig. 11).



NOTE: You can set up both tuners and save the settings, if the option is available in your device.

Note, that you can activate only one tuner as a main input source at the same time.

However, you can activate the second tuner as a backup input (see 11.2.1.2).

Modulation:

Select a modulation type of the signal to be received in this dropdown list: DVB-S BPSK, DVB-S QPSK or DVB-S2 XPSK.

Frequency L-Band:

Enter the frequency of the signal after it leaves the low noise block converter (LNB) ranging from 950-2150MHz.



NOTE: For standard universal LNBs the frequency is typically 9750MHz lower than the sending frequency for lower band transponders (10700-11750MHz) and 10600MHz lower for upper band transponders (11800-12750MHz), i.e. if the sending frequency of a transponder is 12600, then the frequency L-Band value is 2000MHz, assuming that a universal LNB is used.

Symbol rate:

Enter the symbol rate used by the transponder in mega symbols per second (MSym/s).

TS ID:

You can enter Transport Stream ID for low symbol rate transponders with symbol rates below 1MSym/s.

Roll-Off:

Roll-Off factor used by the receiver filter.

Polarization:

Choose either horizontal or vertical polarization used by the transponder or deactivate it in this dropdown list.

Frequency Range:

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

S2 Frame Type and Pilot Mode:

You can use these settings, in order to speed up tuning.

Viterbi (FEC):

Viterbi code puncture rate used by the transponder, if unknown the option "Auto" can be used, resulting in slightly increased tuning

times.

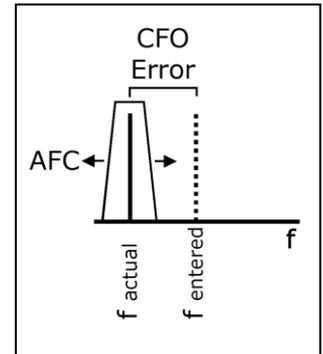
PLS:

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

⇒ Save the settings by clicking the button.

- ✓ The RF-LED in the upper right corner and the RF-LED on the front plate, lit up. In case of low symbol rate signals, this can take up to a few seconds to happen.

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



Edit PIDs

In MCR you can manually define the PIDs to be decoded the TS Input:

To open the PID settings for SAT Tuner:

1. Select **Input-Source→Audio Output 1**.
2. Choose **Transport Stream** as a main input source.
3. Choose **SAT Tuner** as a TS Source.
4. Click the button (see Fig. 10 **(3)**).

⇒ The window *Demux – Main Source* appears.

This menu item is used to make the necessary settings for distributing and processing of up to three PIDs.

To configure PID settings choose the **mode** of operation:

- [SID \(automatic\)](#)
- [PID \(manual\)](#)



NOTE: You can choose only one mode because the modes are mutually exclusive.

i. Configure SID (automatic)

If you select the automatic mode of operation by service ID (SID) and activate the option button **SID (automatic)**, the following window will appear:

- You can configure one SID for automatic processing. PIDs to be decoded are chosen automatically using the service ID number.
- "1.SID" is associated with the first audio interface group (Analog L1/R1, AES/EBU1).
- Settings take effect only when SID mode is enabled.

ii. Configure PID (manual)

If you select the manual mode of operation and activate the option button **PID (manual)**, the following window will appear:

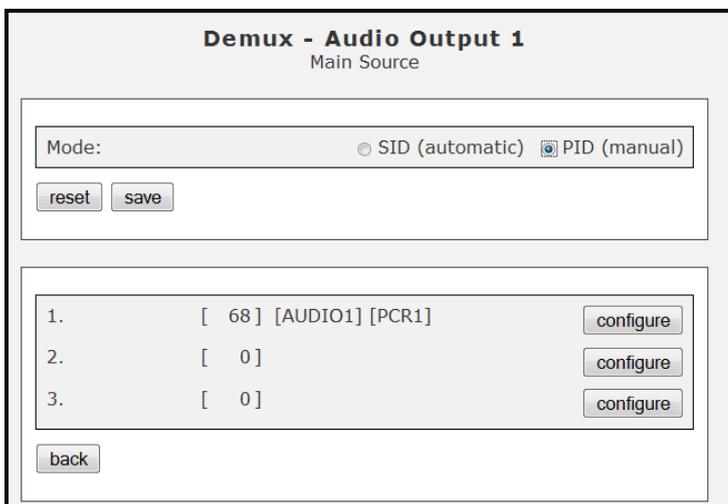


Fig. 12: Demux – Main Source: manual mode of operation for PID configuration.

- Settings take effect only when the **PID (manual)** mode is enabled (see Fig. 12) and saved by clicking the **save** button.
- You can configure up to three individual PIDs manually for further processing instead of selecting them by a service ID. Manual PID configuration offers advanced and special decoding options.
- To configure PIDs manually, click the **configure** button.

⇒ The window *Configure* appears (see Fig. 13).

To set up PIDs to be decoded, enter the following data in the menu fields (see Fig. 13):

Configure Audio Output 1 - PID1
Main Source

Name [max. 12 char]:

Number [0 - 8191]:

Audio

Output:

Audio Synchronization:

Audio Output Stream

Output Format:

DTE1

Data source:

DTE2

Data source:

In-Band Control Data

Data source:

Fig. 13: Manual configuration of PIDs

General Data

Prerequisite for MPE: MCR with MPE option

This field is used to define the PID to be decoded. For MCR with MPE option this menu also allows to extract data from a MPEG TS stream encapsulated within MPE.

Name:	Associate a PID with a name using this field.
Number:	PID number to be processed.
Mode:	Choose between packetized elementary stream (PES) for standard audio and data decoding or multi protocol encapsulation (MPE) decoding when the PID is containing multiprotocol encapsulated IP data (if available).
IP:	Destination IP address of MPE IP audio stream to be decoded.
Port:	Destination Port of MPE IP audio stream to be decoded.

Audio

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

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

Output:	Assign outputs to the decoded audio signal. Note that each output can only be assigned once and has to be reassigned by first unchecking the box in the currently assigned PID first, before being able to assign it to a new PID. Note also that you choose the correct outputs, if a PCR is used (see Audio 1-2 Synchronisation above).
Decoder:	Choose the audio decoder to be used in case there is more than one option.
Delay:	Choose an audio delay that is applied to the output signal.
Audio 1-2 Synchronisation:	Choose the type of synchronization for the audio data within the first and the second audio interface group. You can assign a PCR (Program Clock Reference) to a PID or disable this option by choosing „off“. Note that each PCR can only be assigned once and has to be reassigned by first unchecking the box in the currently assigned PID first, before being able to assign it to a new PID. There is no explicit need to assign a PCR, however in doing so the time before processing starts can be decreased and stability is increased. Note also that PCR 1 is associated only with the first audio interface group (Analog L1/R1, AES/EBU1 and X21.1), PCR 2 with the second group (provided hardware option was ordered).

Audio Output Stream

Prerequisite: IP audio streaming server for monitoring

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

Output Format	Enable audio streaming for current PID by choosing "Icecast" or disable it by choosing "None". The streaming protocol used by Icecast is TCP.
Streaming Port:	Choose port for audio streaming server.

DTE1 and DTE2

Prerequisite for RDS over IP: IP data output

These two fields can be used to configure DTEs 1 and 2 to output data extracted from the PID.

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

In-Band Control Data

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

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

⇒ Save the settings by clicking the  button.

11.2.1.1.2. Audio over IP (Icecast) as an input source

Prerequisite for second client: second audio interface group

In this menu item you can define one Icecast compatible audio streaming server per a corresponding channel.

To configure the 10/100Base-T input for Audio over IP (Icecast) output:

1. Select **Input Source**→**Audio Output 1**.
2. Choose **Audio over IP (Icecast). 1. Server** as a main input source for Audio Output 1 as described in section 11.2.1.1. The following menu appears:

Input Source for Audio Output 1	
 Main source: <input type="text" value="Audio over IP (Iccast), 1. Server"/>	<input type="checkbox"/> Enabled
<input type="text" value="Port 0"/>	<input type="button" value="edit"/>

Fig. 14: Main source for Audio Output 1: Audio over IP (UDP).



NOTE: It is necessary to configure a gateway under **Network Settings**→**TCP/IP** in order for the clients to reach the servers. Clients use the 10/100-Base-T Ethernet interface (control and monitoring). If an URL is chosen instead of an IP address at least one DNS server needs to be configured (**Network Settings**→**TCP/IP**).

- Click the button.
- Enter the following data in the menu fields:

Name:	Assign a name to the Icecast server for better reference.
IP or URL:	Icecast server IP address or URL, i.e. "247.56.38.14" or "www.backup-audio.com"
Port:	Icecast server port, i.e. "8080".
Ignore First Streaming data:	Ignore the first 0 to 20 seconds of audio data. Can be used to ignore burst audio data transfers that usually start each new audio data transmission from Icecast servers, after a few seconds, the incoming data is more streamlined, resulting in better and especially synchronized audio playback.
Delay:	Delay time from 10 to 2000ms before playback is started. Note that the delay timer is started after the "ignore first streaming data timer" has expired.

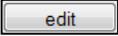
To set up SNMP monitoring functions for Audio over IP Output see section 11.2.1.3.

11.2.1.1.3. Internal Storage as an input source

Prerequisite: MCR20x

The internal storage can be used as a primary source to store audio files to be played back to the correspondent audio channel. Audio files can be uploaded to the internal storage using a FTP client connecting to the 10/100Base-T interface (same as web interface) using the login data of the web interface. Alternatively, the 2wcom Satellite In-Band Control System can be used to download files via satellite onto the internal storage. For further information on 2wcom's Satellite In-Band Control System contact us.

To configure a file for an audio slot:

1. Select **Input Source**→**Audio Output 1**.
2. Choose **Internal Storage** as a main input source for Audio Output 1 as described in section 11.2.1.1.
3. Click the  button.
4. Select the audio file to be played back from the dropdown list **File**.
5. Save the settings by clicking .



NOTE: Upload a file to the internal storage directory, in order to make a file visible in the dropdown list.

To set up SNMP monitoring functions for internal storage see section 11.2.1.3.

11.2.1.2. Backup source settings

Additionally to the main source it is possible to define up to three backup sources in case of an input source failure. All possible main input sources can be used as backup sources (see section 11.2.1.2): Tuner Transport Stream (TS), Audio over IP (Icecast) and audio files uploaded to the Internal Storage.

There are some examples for different setting combinations, which have to be regarded:

1. Different sources (see Fig. 15):

Input Source for Audio Output 1

<input checked="" type="radio"/>	Main source: Transport Stream	Enabled <input checked="" type="checkbox"/>
	TS Source*: SAT Tuner	
	SAT Tuner A, DVB-S QPSK, 1666.000 H 27.500000-Auto, no PID	<input type="button" value="edit SAT"/> <input type="button" value="edit PID"/>
<input checked="" type="radio"/>	1. Backup: Audio over IP (Iccast), 1. Server	Enabled <input checked="" type="checkbox"/>
	Port 0	<input type="button" value="edit"/>
<input checked="" type="radio"/>	2. Backup: Internal Storage	Enabled <input checked="" type="checkbox"/>
	File: NONE	<input type="button" value="edit"/>
<input type="radio"/>	3. Backup: n/a	Enabled <input type="checkbox"/>

*) Selected TS source is automatically used for all audio channels!

SNMP trap on every input source switch

Signal active backup via LED Relay ---

Fig. 15: Example for different backup source settings.

For example, "Transport Stream" is chosen as the main source for Audio Output 1 and "Audio over IP (Icecast)" used as the first backup source. If even the Icecast Server does fail, the internal storage is configured as an additional backup. It is possible to temporarily disable a chosen input source without the need to alter the source order; when e.g. disabling the main source in the above example (Fig. 15), the MCR will immediately switch to the backup source so that you are able to check the corresponding settings.

If you have configured different main and backup sources, the system will be continuously checking for all available prior sources and switches automatically back as soon as the signal is good again.



NOTE: The device will only switch, if the backup source is available.

2. Several identical sources (see Fig. 16):

For example, two identical input sources for Audio Output 1 are chosen, e.g. SAT Tuner as a main source and as the first backup with different frequencies. If the main source fails, the system switches to the first backup by tuning to the configured frequency.

Fig. 16: Example for identical main and backup input source.

But note (!), that the system is not checking, if the main source (also SAT Tuner) is again available, because there is only one tuner and it cannot tune on different frequencies at the same time. Therefore, the second SAT Tuner backup remains active, till it fails. The system does not switch back automatically to the main source.

This applies to all other identical input sources: the system switches further to the next or prior source automatically only if the active backup source fails.

You can only switch back to the main source, if you re-enable the active backup source manually.

3. Two identical backup sources and one different/distinguishing backup source (Fig. 17):

If you set up two identical sources as well as one different backup source and both inputs fail, the system switches to the different backup and continues checking the prior sources.

The red blinking lamp near the source means, that this source is now being checked for the signal quality.

Fig. 17: Example for two identical and one different input source.

If one of the identically configured prior sources is again available, the system switches to it automatically.

You can configure backup sources in a similar way as the main source because all sources can be used also as secondary inputs.

To configure the backup sources:

1. Select **Input Source**→**Audio Output 1**.
2. In the red box in Fig. 18 you can activate and configure up to three backup sources.
3. Follow the same steps as in the main source settings in section 11.2.1.1.

Input Source for Audio Output 1

Main source: n/a Enabled

1. Backup: n/a Enabled

2. Backup: n/a Enabled

3. Backup: n/a Enabled

SNMP trap on every input source switch

Signal active backup via LED Relay ---

reset save

Fig. 18: Backup source settings for Audio Output 1.

For each source you can set up the monitoring functions via SNMP manager (see section 11.2.1.3).

11.2.1.3. Activate Monitoring Function

In every settings menu for Input Sources there is a field (e.g. under the red frame in Fig. 18), in which you can activate monitoring function of the SNMP manager for the current input source and enable the signal for active backup via LED which will be blinking red, if a backup source is active. You can also set up the relays' number for alarm signal. Note that you can choose only the relay, which is activated under **Interface Settings** → **Relay** for alarm.

SNMP trap on every input source switch

Signal active backup via LED Relay ---

Fig. 19: Monitoring activation menu.

11.2.2. Audio Output 2

Prerequisite: MCR102 or MCR202



NOTE: If the main input source for audio outputs is Transport Stream, both audio outputs can use only one input except for the internal storage (see section 11.2.1.1).
It means that you can only set up the same TS Source for Audio Output 1 and Audio Output 2: SAT Tuner.

You can set the primary and secondary Input Sources for the Audio Output 2 in a similarly way as for Audio Output 1. Follow the analog steps for the configuration of the Audio Output 1 in section 11.2.1 and apply the instructions correspondently for the Audio Channel 2 and IP Server 2.

11.2.3. Switch Criteria

This menu item is available under **Input Source**→**Switch criteria** and is used to define the criteria for switching between the main and different backup input sources:

11.2.3.1. Switch Criteria for SAT Tuner

To define the switch criteria for SAT Tuner input source:

1. Select **Input Source**→**Switch criteria**.

⇒ The following menu for **Tuner (TS)** appears (see Fig. 20):

Input source switch criteria	
Tuner (TS)	
RF power	Enabled <input type="checkbox"/>
-40 dBm +/- 10 dBm	T1 60 s T2 30 s
C/N	Enabled <input type="checkbox"/>
< 10 dB	T1 30 s T2 10 s
Vit./LDPC BER	Enabled <input type="checkbox"/>
> 1.00E-4	T1 60 s T2 30 s
TS Sync	Enabled <input checked="" type="checkbox"/>
	T1 30 s T2 30 s

Fig. 20: Switch criteria for main and backup input source - SAT Tuner

2. Enter the following data in the menu field **Tuner (TS)**:

- | | |
|----------|--|
| RF power | – Activate the criteria by ticking Enabled . |
| | – Enter the acceptable interval “good” for radio frequency |

(minimum/maximum). If the signal does not match to this interval, the system will regard it as "bad" and will switch to the backup source.

- Define the delay time T1 (in seconds) when the system should switch to the backup source, if the RF signal is "bad".
- Define the time T2 (in seconds), how long a "good" RF signal should be available, before the system switches back to the main source.

C/N

- Activate the criteria by ticking **Enabled**.
- Enter the minimal "good" value for the Channel to Noise Ratio. The signal under this defined value will be regarded by the system as "bad", so that after the delay time T1 it will switch to the backup source.
- Define the time T2 (in seconds), how long a "good" C/N signal should be available, before the system switches back to the main source.

Vit./LDPC BER

- Activate the criteria by ticking **Enabled**.
- Enter the maximal "good" value for the Bit Error Rate, e.g. $1,00 \cdot e^{-4}$. The received signal above this defined value will be regarded by the system as "bad", so that after the delay time T1 it will switch to the backup source.
- Define the time T2 (in seconds), how long a "good" BER signal should be available, before the system switches back to the main source.

TS Sync

- Activate the criteria by ticking **Enabled**.
- Define the delay time T1 (in seconds), when the system should switch to the backup source, if TS synchronization fails.
- Define the time T2 (in seconds), how long TS synchronization should be available, before the system switches back to the main source.

3. Save the settings by clicking the  button on the bottom of the page.



NOTE: If you define several switching criteria for SAT Tuner, the system will switch to the backup source, as soon as at least one enabled function is applied. However, the system will switch back to the main source, only when all defined criteria for switching back are again fulfilled.

11.2.3.2. Switch criteria for Audio over IP (Icecast)

To define the switch criteria for Audio over IP (Icecast):

1. Select **Input Source**→**Switch criteria**.

⇒ The following menu for **Audio over IP Input (Icecast)** appears (see Fig. 21):

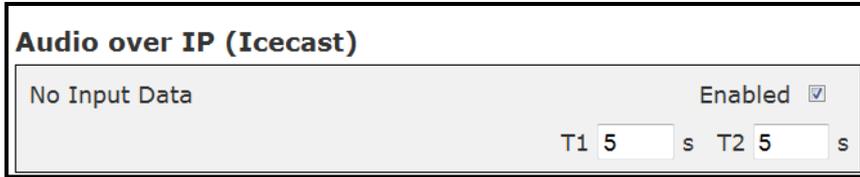


Fig. 21: Switching criteria for main and backup input source – Audio over IP Input (Icecast)

2. Enter the following data in the menu field **Audio over IP (Icecast)**:

- | | |
|---------------|---|
| No Input Data | <ul style="list-style-type: none">– Activate the criteria by ticking Enabled.– Define the delay time T1 (in seconds), when the system should switch to the backup source, if no input data is being received.– Define the time T2 (in seconds), how long the input data should be available, before the system switches back to the main source. |
|---------------|---|

3. Save the settings by clicking the button on the bottom of the page.

11.2.3.3. Switch criteria for Internal Storage

Prerequisite: MCR20x

To define the switch criteria for Internal Storage:

1. Select **Input Source**→**Switch criteria**.

The following menu for **Internal Storage** appears (see Fig. 22).

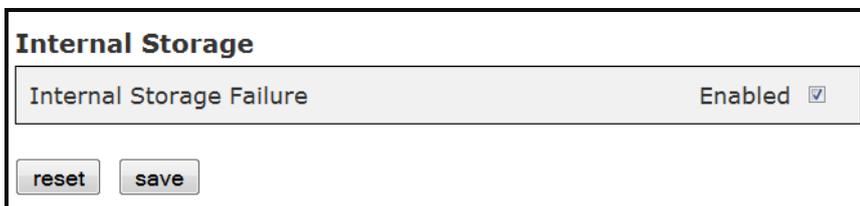


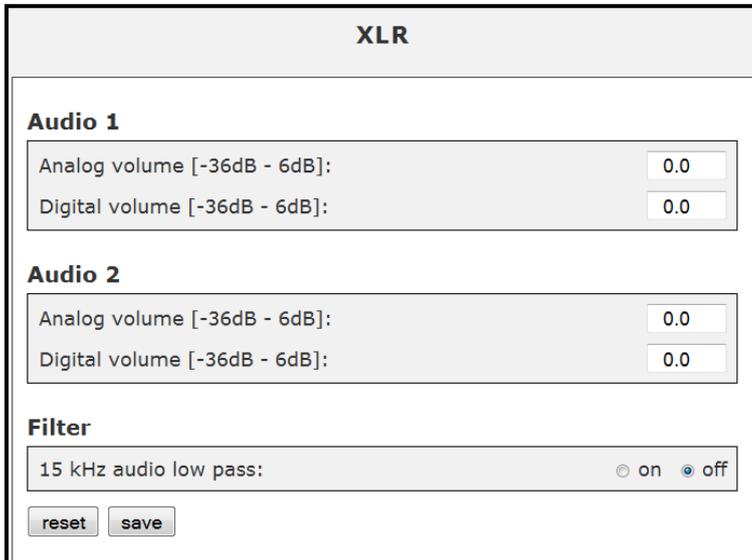
Fig. 22: Switching criteria for main and backup input source – Internal Storage.

2. Activate the criteria by ticking **Enabled** in the menu field **Internal Storage**, and the system will switch to the backup source as soon as internal storage fails.
3. Save the settings by clicking the button on the bottom of the page.

11.3. Interface Settings

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

This menu item is available under **Interface Settings**→**XLR** and is used to adjust the output level of the XLR outputs, separately for the analog outputs and digital AES/EBU outputs. Adjustable range: -36...+6 dB (related to the received signal) (see **Fig. 23**):



XLR	
Audio 1	
Analog volume [-36dB - 6dB]:	0.0
Digital volume [-36dB - 6dB]:	0.0
Audio 2	
Analog volume [-36dB - 6dB]:	0.0
Digital volume [-36dB - 6dB]:	0.0
Filter	
15 kHz audio low pass:	<input type="radio"/> on <input checked="" type="radio"/> off
<input type="button" value="reset"/> <input type="button" value="save"/>	

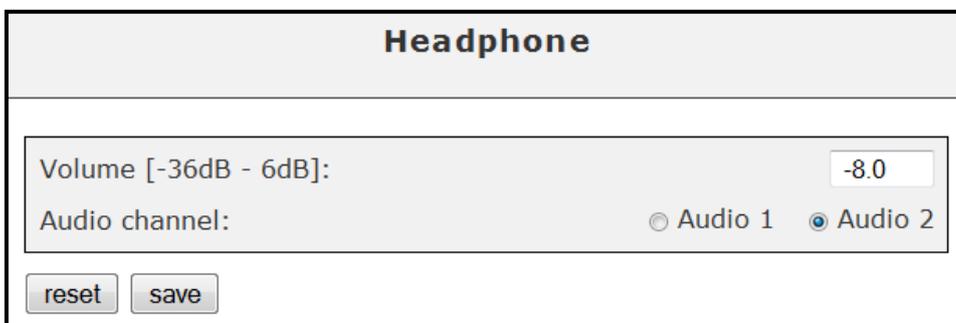
Fig. 23: Interface Settings Menu - XLR

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

⇒ Save the settings by clicking the button.

11.3.2. Headphone: adjusting headphone audio volume

This menu item is available under **Interface Settings**→**Headphone** and is used to adjust the volume at the headphone output (see Fig. 24).



Headphone	
Volume [-36dB - 6dB]:	-8.0
Audio channel:	<input type="radio"/> Audio 1 <input checked="" type="radio"/> Audio 2
<input type="button" value="reset"/> <input type="button" value="save"/>	

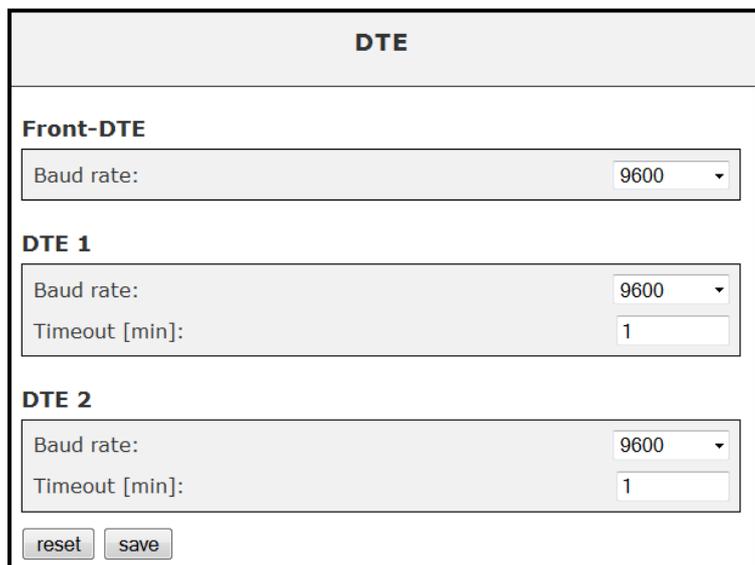
Fig. 24: Interface Settings Menu - Headphone.

Adjustable range: -36...+6 dB (related to the received signal).

⇒ Save the settings by clicking the button.

11.3.3. DTE: configuration of the serial RS-232 interfaces

This menu item is available under **Interface Settings→DTE** and is used to configure the serial RS-232 interfaces Front-DTE, DTE1 and DTE2 of the device.



The screenshot shows a web-based configuration interface for DTE settings. At the top, there is a header labeled "DTE". Below this, there are three sections: "Front-DTE", "DTE 1", and "DTE 2". Each section contains a "Baud rate" dropdown menu set to "9600" and a "Timeout [min]" input field set to "1". At the bottom of the interface, there are two buttons: "reset" and "save".

Fig. 25: Interface Settings Menu - DTE.

Configurable settings are the baud rate and the data activity timeout (DTE1 and DTE2 only).

Possible baud rates: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud.

⇒ Save the settings by clicking the button.

11.3.4. Relay: relay configuration

This menu item is available under **Interface Settings→Relay** and is used to configure the relay outputs of the device (see Fig. 26).

Relay			
State			
Relay 1 (1.1)	OFF	Relay 5	OFF
Relay 2 (1.2)	OFF	Relay 6	OFF
Relay 3 (1.3)	OFF	Relay 7	Pos.A
Relay 4 (1.4)	OFF		
Settings			
Name	Source	inverted	latch limit [0=off, min:500ms]
Relay 1 (1.1)	Alarm	no	0 00 ms
Relay 2 (1.2)	Alarm	no	0 00 ms
Relay 3 (1.3)	Alarm	no	0 00 ms
Relay 4 (1.4)	Alarm	no	0 00 ms
Relay 5	Alarm	no	0 00 ms
Relay 6	Alarm	no	0 00 ms
Relay 7	Alarm	no	0 00 ms
Power failed relay:		none	
Remote command relay pulse time:		500	ms
Relay command debounce period:		8053719	ms
<input type="button" value="reset"/> <input type="button" value="save"/>			

Fig. 26: Interface Settings Menu - Relay.

State:

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

Settings:

Source:	<p>In this drop menu choose the source which should switch the correspondent relay:</p> <ul style="list-style-type: none"> • Alarm <ul style="list-style-type: none"> ○ see section 11.2.1.3 to activate monitoring functions for different sources ○ see section 11.5.5 to set up alarm • Q561 input – the corresponding GPIO Input of a Q561 MPEG encoder drives the relay. • Remote command – the commands via the remote control function.
inverted:	<p>Relays functions can be inverted here. Also the brownout function (typically assigned to relay 7) can be assigned to another relay. This will override its original function though.</p>
Latch limit:	<p>Enter the time, how long the relay should be on. 0 ms means that the relay will be switched of as soon as the alarm is off.</p>

Power failed relay:	Define the relay which will be responsible for indicating power failure.
Remote command relay pulse time:	If necessary, define pulse time for switching the relay via remote command.
Relay command debounce period:	Define the period, in which the switching commands received via the remote control should be executed, for example to ignore the same commands being sent several times in a short period of time. 0 ms means that all commands will be executed.

⇒ Save the settings by clicking the button.

11.3.5. Optical Coupler: optical coupler configuration

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

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

Settings: Each coupler input can be assigned to switch audio playback from satellite audio, to redundant audio streaming server 1, server 2 or to both (see 11.2.1.2 Backup source settings).

⇒ Save the settings by clicking the button.

11.4. Network Settings

11.4.1. TCP/IP: configuration of the Control Interface (10/100)

This menu item is available under **Network Settings→TCP/IP** and is used to configure the Ethernet interface (control/monitoring) of the device (see Fig. 27).

The screenshot shows a web-based configuration page titled "TCP/IP". Under the heading "Control Interface (10/100Base-T)", there are several settings:

- DHCP: on off
- MAC address: 00:11:99:00:1D:37
- IP address: 192.168.14.73
- Subnet mask: 255.255.255.0
- Gateway: 0.0.0.0
- Primary DNS: 0.0.0.0
- Secondary DNS: 0.0.0.0
- MTU: 1500
- Http port: 80

At the bottom of the form, there are two buttons: "reset" and "save".

Fig. 27: Network Settings: TCP/IP – Control Interface.

Configurable settings are the IP-address, subnet mask, gateway, and the http port.

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

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

⇒ Save the settings by clicking the button.

11.4.2. SNTP: date and time setup

This menu item is available under **Network Settings**→**SNTP** and is used to enable the synchronization of the devices date and time with an external SNTP server (see Fig. 28).

Fig. 28: Network Settings - SNTP.

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

⇒ Save the settings by clicking the button.

11.4.3. SNMP: SNMP configuration

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

This menu item is available under **Network Settings**→**SNMP** and is used to setup the IP addresses of the SNMP managers (see Fig. 29).

SNMP

First manager

1. IP Address: 0.0.0.0
Send trap: on off

Second manager

2. IP Address: 0.0.0.0
Send trap: on off

Read community

1. read community: public
2. read community: public

Write community

1. write community: private
2. write community: private

Fig. 29: Network Settings – SNMP.

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

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

⇒ Save the settings by clicking the button.



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

SNMP traps used by the monitoring function:

Trap No.	Trap Name	Monitoring Function
1	tunerRfPowerEvent	Signals the status of the SAT tuner RF power
2	tunerCnEvent	Signals the status of the SAT tuner C/N value
3	tunerBerEvent	Signals the status of the SAT tuner Viterbi/LDPC value
4	tunerTsSyncEvent	Signals the SYNC status of the TS received via the SAT tune
7	etr290ConformityEvent	Signals the ETR 290 conformity of the currently active TS
9	aoipIcecastInputDataEvent	Signals the input data status for Audio over IP (Icecast)
10	audioEvent	Signals the audio data status (presence/absence of audio data)
11	audioLevelEvent	Signals the status of the audio level (silence detection)
12	dteEvent	Signals the status of the DTE (ancillary) data
13	internalStorageEvent	Signals the status of the internal storage
14	caseTemperatureEvent	Signals the case temperature status
15	inputSourceEvent	Signals the current input source for the different outputs



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

1) audioEvent 1 and 2

11.4.4. FTP

This menu item is available under **Network Settings**→**FTP** and is used to setup the IP addresses of two FTP external servers for downloading files to the internal storage of the device and uploading health reports about the status of the device as well as other files to the server (see Fig. 30).

The screenshot shows a web-based configuration interface for FTP. The title bar says 'FTP'. There are three main sections:

- 1. External FTP Server:** Includes fields for 'IP Address or URL:', 'Login name:', 'Login password:', and 'Login password (repeat):'. Below these is a dropdown menu for 'FTP Mode:' currently set to 'active'.
- 2. External FTP Server (for report copies):** Includes the same fields as section 1.
- FTP Client behavior:** Includes two dropdown menus: 'Health report upload interval:' and 'Synchronization interval:', both currently set to 'Never'.

At the bottom of the form are two buttons: 'reset' and 'save'.

Fig. 30: Network Settings – FTP.

Enter the following data in the menu field in Fig. 30:

1. External FTP Server:	The device can get files from an external FTP server and save them in the internal storage and send health reports to the FTP server with information about the status of the device. Enter the access data to the 1. FTP server such as the IP Address or URL, login name and password. Choose an active or passive FTP mode in the drop list.
2. External FTP Server:	It can be used only for uploading copies of the health reports additional to 1. External FTP Server. Configure the access data for the 2. External FTP server in the same way as the 1. FTP server above.
FTP Client behavior:	Health report upload interval - Choose the period of time, how often the device should upload the health reports with the status to the external FTP servers. Synchronization interval – Choose the period of time, how often the device should access to the server.

⇒ Save the settings by clicking the  button.

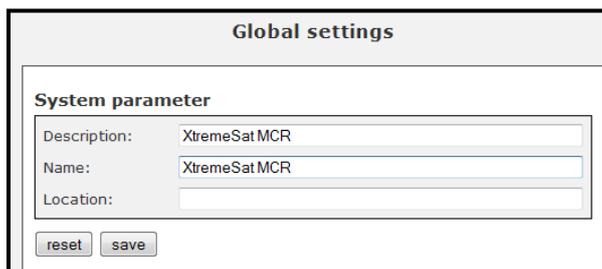
11.5. System Settings

11.5.1. Global settings: device parameters and settings

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

11.5.1.1. System parameter – device identification

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



The screenshot shows a web interface titled "Global settings". Inside, there is a section titled "System parameter". This section contains three text input fields: "Description:" with the value "XtremeSat MCR", "Name:" with the value "XtremeSat MCR", and "Location:" which is currently empty. Below these fields are two buttons: "reset" and "save".

Fig. 31: Global settings – System parameter

⇒ Save the settings by clicking the button.

11.5.1.2. System information

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

System information	
Last reboot [dd.mm.yyyy hh:mm:ss]:	30.07.2012 12:04:12
Uptime [days, hh:mm:ss]:	0 days, 22:34:04
Serial number:	430.000185
Device type:	XtremeSat MCR-202
ARM firmware version:	2.76 (CF)
DSP firmware version:	3.11
FPGA firmware version:	---
MIB version:	1.00
Customer:	Default
Rights:	Analog-1 Digital-1 Analog-2 Digital-2 Tuner Audio over IP (out) RDS over IP AAC apt-X Monitor RDS Data Audio over IP (in) Display Audio fading Remote Control Internal Storage FlexSource Advanced Regionalization
Device temperature:	35.5 °C

Fig. 32: System settings - System information

11.5.1.3. Upload Settings – restore device settings

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

11.5.1.4. Firmware Update

This dialog can be used to update a devices firmware. To upload a firmware setting file, click “Browse...” locate and select the firmware file and click . Note that upload times can vary and must not be interrupted. After a successful upload the user is prompted to reboot the device. Accidental interruption (user or network) of the upload has no impact on the device’s functioning. It can simply be restarted. Firmware uploads are protected by CRC.

11.5.1.5. Download Settings

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

11.5.1.6. Reboot and Factory Settings

These two dialogs can be used to manually reboot the device (click the **reboot** button) and to reset the user configurable device parameters to factory settings (click the **load factory settings** button). Note that in the latter case **all** user configurable data, with the exception of the device's control interface IP address data (web interface), is deleted! This also includes the user accounts, which will be reset to the default described in this manual.

11.5.2. Time: date and time setup

This menu item is available under **System Settings**→**Time** and is used to configure the time zone and the date of the device clock (see Fig. 33).

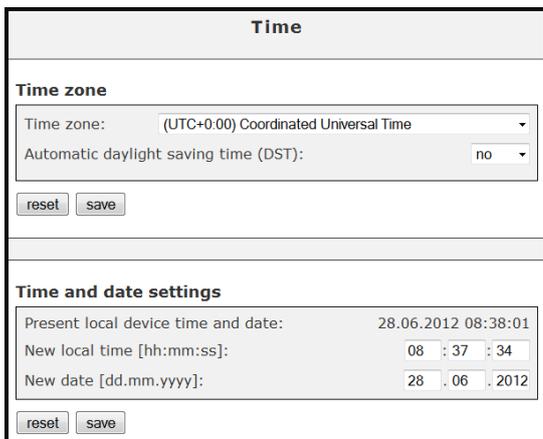


Fig. 33: System settings – Time

Time zone:	
Time zone:	Choose the present time zone of the device clock from the drop list.
Automatic daylight saving time (DST):	You can activate a city-based time zone system separately for this device, which automatically detects daylight saving time (summer time) periods and adjusts corresponding dates' outputs accordingly.

⇒ Save the settings by clicking the **save** button.

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

⇒ Save the settings by clicking the **save** button.

11.5.3. User

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

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

⇒ Save the settings for each account by clicking the button.

11.5.4. Preset station preset configuration, activation, and copying

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

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

Preset name:	Assign a name to the current preset.
Selected preset:	Select the desired station preset.
Save present preset in:	This can be used to copy the current preset select into another preset, overwriting it in the process.

⇒ Save the settings for each field individually by clicking the button.



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

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

11.5.5. Alarm

This menu item is available under **System Settings→Alarm** and is used to configure a monitoring of RF parameter, PID parameter, as well as the RS-232 DTE interfaces. If monitoring triggers an alarm, the device can send SNMP traps, can switch one of the seven

integrated relays and can activate the "Warning" LED on the web interface and the front panel of the device.

The monitoring functions have an alarm activation delay time (T1) and some also have an alarm reset delay time (T2) in seconds (see 11.2.3 "Switch Criteria", page 41).

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

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

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

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

11.5.5.1. Alarm Settings: Tuner (TS)

This menu item is available under **System Settings**→**Alarm** (see Fig. 34).

Alarm settings

Tuner (TS)

<input checked="" type="radio"/> RF power	Enabled <input type="checkbox"/>
-40 dBm +/- 10 dBm T1 60 sec T2 30 sec	
SNMP <input checked="" type="checkbox"/> LED <input type="checkbox"/> Relay ---	

<input checked="" type="radio"/> C/N	Enabled <input type="checkbox"/>
< 10 dB T1 30 sec T2 10 sec	
SNMP <input checked="" type="checkbox"/> LED <input type="checkbox"/> Relay ---	

<input checked="" type="radio"/> Vit./LDPC BER	Enabled <input type="checkbox"/>
> 1.00E-4 T1 60 sec T2 30 sec	
SNMP <input checked="" type="checkbox"/> LED <input type="checkbox"/> Relay ---	

<input checked="" type="radio"/> TS Sync	Enabled <input type="checkbox"/>
T1 30 sec T2 30 sec	
SNMP <input checked="" type="checkbox"/> LED <input type="checkbox"/> Relay ---	

Fig. 34: Alarm settings – Tuner (TS)

Enter the following data in the menu field shown in Fig. 34:

RF power:	<p>Monitors the RF level at the RF-IN input for significant variations. It is possible to define a reference level and a tolerance range. Unit: dBm</p> <ul style="list-style-type: none"> – Activate the monitoring parameter by ticking Enabled. – Enter the acceptable interval "good" for radio frequency (minimum/maximum). If the signal does not match to this interval, the system will regard it as "bad" and will trigger the alarm. – Define the delay time T1 (in seconds) when the system should trigger the alarm, if the RF signal is "bad". – Define the time T2 (in seconds), how long a "good" RF signal should be available, before the system switches off the alarm. – Activate the warning signal by ticking LED or/and SNMP and choose a responsible relay.
C/N:	<p>Monitors the calculated signal carrier/noise ratio. Unit: dB</p> <ul style="list-style-type: none"> – Activate the criteria by ticking Enabled. – Enter the minimal "good" value for the Channel to Noise Ratio. The signal under this defined value will be regarded by the system as "bad", so that after the delay time T1 it will trigger the alarm. – Define the time T2 (in seconds), how long a "good" C/N signal should be available, before the system switches off the alarm. – Activate the warning signal by ticking LED or/and SNMP and choose a responsible relay.
Vit./LDPC BER:	<p>Monitors the detected bit error rate (BER) in front of the Viterbi decoder of the decoded signal.</p> <ul style="list-style-type: none"> – Activate the criteria by ticking Enabled. – Enter the maximal "good" value for the Bit Error Rate, e.g. $1,00 \cdot e^{-4}$. The received signal above this defined value will be regarded by the system as "bad", so that after the delay time T1 it will trigger the alarm. – Define the time T2 (in seconds), how long a "good" BER signal should be available, before the system switches off the alarm. – Activate the warning signal by ticking LED or/and SNMP and choose a responsible relay.
TS Sync:	<p>Monitors for a loss of the positive transport stream (TS) detection.</p> <ul style="list-style-type: none"> – Activate the criteria by ticking Enabled.

- Define the delay time T1 (in seconds), when the system should trigger the alarm, if TS synchronization fails.
- Define the time T2 (in seconds), how long TS synchronization should be available, before the system switches off the alarm.
- Activate the warning signal by ticking **LED** or/and **SNMP** and choose a responsible relay.

⇒ Save the settings by clicking the button.

11.5.5.2. Alarm Settings: Demuxed Data

This menu item is available under **System Settings**→**Alarm** (see Fig. 35).

The screenshot shows the 'Demuxed Data' configuration page. It contains four rows of settings:

- Audio 1:** Enabled . T1: 10 sec, T2: 5 sec. SNMP , LED , Relay: ---
- Audio 2:** Enabled . T1: 10 sec, T2: 5 sec. SNMP , LED , Relay: ---
- DTE 1:** Enabled . T1: 1 min, T2: 1 min. SNMP , LED , Relay: ---
- DTE 2:** Enabled . T1: 1 min, T2: 1 min. SNMP , LED , Relay: ---

Fig. 35: Alarm settings: Demuxed Data.

You can set up alarm for the following criteria:

Audio 1:	Monitors the signal for a loss of the positive audio stream 1 detection.
Audio 2:	Monitors the signal for a loss of the positive audio stream 2 detection.
DTE 1:	Monitors the DTE 1 interface for data inactivity. If the monitoring is activated and active data is detected, the green LED "data" on the front panel of device is activated.
DTE 2:	Monitors the DTE 2 interface for data inactivity. If the monitoring is activated and active data is detected, the green LED to the right side of the "Data" LED on the front panel of device is activated.

Enter the following data in the menu field for each function shown in Fig. 35:

1. Activate the monitoring parameter by ticking **Enabled**.
 2. Define the delay time T1 (in seconds), when the system should trigger the alarm, if data processing fails.
 3. Define the time T2 (in seconds), how long data processing should be available, before the system switches off the alarm.
 4. Activate the warning signal by ticking **LED** or/and **SNMP** and choose a responsible relay.
- ⇒ Save the settings by clicking the button.

11.5.5.3. Audio over IP (Icecast)

This menu item is available under **System Settings**→**Alarm** (see Fig. 36).

Fig. 36: Alarm settings: Audio over IP (Icecast).

You can set up alarm for the following criteria:

No Input Data Channel 1	Monitors the 10/100Base-T interface for inactive audio data input for audio channel 1.
No Input Data Channel 2	Monitors the 10/100Base-T interface for inactive audio data input for audio channel 2.

Enter the following data in the menu field for each function shown in Fig. 37:

1. Activate the monitoring parameter by ticking **Enabled**.
 2. Define the delay time T1 (in seconds), when the system should trigger the alarm, if data input is inactive.
 3. Define the time T2 (in seconds), how long data input should be available again, before the system switches off the alarm.
 4. Activate the warning signal by ticking **LED** or/and **SNMP** and choose a responsible relay.
- ⇒ Save the settings by clicking the button.

11.5.5.4. Audio silence detection

This menu item is available under **System Settings→Alarm** (see Fig. 37).

Audio silence detection

● Audio 1 Enabled

< -60 dBFS T1 30 sec T2 30 sec

SNMP LED Relay ---

● Audio 2 Enabled

< -60 dBFS T1 30 sec T2 30 sec

SNMP LED Relay ---

Fig. 37: Alarm settings: Audio silence detection

You can set up alarm for the following criteria:

Audio 1	Monitors the decibel amplitude level of audio output 1 for silence and inactivity.
Audio 2	Monitors the decibel amplitude level of audio output 2 for silence and inactivity.

Enter the following data in the menu field for each function shown in Fig. 37:

1. Activate the monitoring parameter by ticking **Enabled**.
2. Enter the minimal “good” value for the decibel amplitude level of the audio output. The signal under this defined value will be regarded by the system as “bad”, so that after the delay time T1 it will trigger the alarm.
3. Define the time T2 (in seconds), how long a “good” audio signal should be “good” again, before the system switches off the alarm
4. Activate the warning signal by ticking **LED** or/and **SNMP** and choose a responsible relay.

⇒ Save the settings by clicking the button.

11.5.5.5. Case temperature

This menu item is available under **System Settings→Alarm** (see Fig. 38).

Fig. 38: Alarm settings: Case temperature.

You can set up alarm for the following criteria:

System overheated	Monitors the device temperature for overheating.
-------------------	--

Enter the following data in the menu field for each function shown in Fig. 38:

1. Activate the monitoring parameter by ticking **Enabled**.
2. Enter the minimal "good" value for the decibel amplitude level of the audio output. The signal under this defined value will be regarded by the system as "bad", so that after the delay time T1 it will trigger the alarm.
3. Define the time T2 (in seconds), how long a "good" audio signal should be "good" again, before the system switches off the alarm.
4. Activate the warning signal by ticking **LED** or/and **SNMP** and choose a responsible relay.

⇒ Save the settings by clicking the button.

11.5.6. Remote Control

Prerequisite: Control via satellite carrier

Using remote control, it is possible to easily control and service a network of MCR devices from one single location. Remote control is primarily intended for servicing of remote locations, which often lack fast internet connections, via satellite. But it can also be used to service the entire network via IP. Of course, a mixture of satellite and IP connections is also possible.

Devices can be addressed by device type, serial number, group name or group number, allowing the controller (the embedded 2wcom Controller EC01) to apply individual updates, i.e. change a devices preset, or target groups of devices, i.e. update the firmware of all tuned in MCR receivers.

Remote control can be used to do the following:

Firmware updates: New device firmware can be uploaded using remote control and is stored until the controller sends an activation command, enabling the controller to precisely time the update process in the network. All

uploads are CRC protected and updates only take place if CRC check passes.

Change presets: Presets can be changed using remote control.

Switch relays: Relay states can be changed using remote control.

Device configurations: A new device configuration file can be uploaded using remote control and is stored until the controller sends an activation command, enabling the controller to precisely time the update process in the network. All uploads are CRC protected and updates only take place if CRC check passes.

Upload files: Different Files can be uploaded using remote control, for example audio files, playlists and audio scheduling files.

Switch programs: You can switch presets, play back audio files from the SD card, switch audio PID and switch the redundant audio source via remote control.

The remote control data can be transported via a special data channel with an own PID (in-band, when no IP connection is available).

If an IP connection to the device is available, it can also be transported via an UDP IP stream (out of band).

In order to use remote control, the remote control data web page needs to be configured (see [Edit PIDs](#) on page 31).

This menu item is available under **System Settings**→**Remote Control** and is used to configure the access control to the device via remote control (see Fig. 39).

Remote control settings	
Group assignment	
Group name (max. 8 char)	Assigned to
1. Group: NDR	Device [-] [+]
2. Group: RadioNW	Audio Output 1 [-] [+]
3. Group: East	Audio Output 1 [-] [+]
4. Group: Group1	Audio Output 2 [-] [+]
In-Band Control Data PIDs	
PID1 [0 - 8191]:	1254
PID2 [0 - 8191]:	2897
[reset] [save]	

Fig. 39: System settings: Remote control settings.

You can set up alarm for the following criteria:

Group assignment	You can assign the device or individual channel to up to twelve groups of devices.
------------------	--

In-Band Control Data
PIDs

In this field it is necessary to set the number of the PID containing the remote control data.

Enter the following data in the menu field shown in Fig. 39:

1. Enter the name of the device group which the device should be assigned to. Use max. 8 characters. Don't use such special characters as (/), (.), (§) etc.
2. Choose the device or an individual audio output in the drop list which should be assigned to the group for remote controlling.
3. Click the "+"-Button to add a new group.



NOTE: You can assign the same device or audio output to several groups.

4. Enter the numbers of max. two PIDs containing the remote control data.

⇒ Save the settings by clicking the button.

11.5.7. Crossfading

Prerequisite: Crossfading option

This menu item is available under **System Settings**→**Crossfading** and is used to configure the duration of a gradual increase or decrease in the level of an audio signal (**fading**) for both audio outputs (see Fig. 40). You can use this option, when the receiver switches from the main source to the internal storage for playing back the audio files. The function "Crossfading" enables parallel reduction (**fade-out**) of the previous audio signal and increase of the next audio signal from silence (**fade-in**) to the normal level, so that the crossing of two signals sounds equally.

Crossfading

Audio Output 1

Fade in mode: linear ▾

Fade out mode: linear ▾

Fade in time (0 - 5000 ms): 10⁰⁰ ms

Fade out time (0 - 5000 ms): 10⁰⁰ ms

Active level during cross-fade: 0 dB

Inactive level during cross-fade: -110 dB

Audio Output 2

Fade in mode: linear ▾

Fade out mode: linear ▾

Fade in time (0 - 5000 ms): 10⁰⁰ ms

Fade out time (0 - 5000 ms): 10⁰⁰ ms

Active level during cross-fade: 0 dB

Inactive level during cross-fade: -110 dB

Fig. 40: System settings: Crossfading.

The following functions are available in the setting menu Fig. 40 for each audio output:

Fade in mode:	Temporally only linear mode of fade-in is available, it means that the level of the audio signal is decreasing steadily during the configured time.
Fade out mode:	Temporally only linear mode of fade-out is available, it means that the level of the audio signal is increasing steadily during the configured time.
Fade in time:	Duration of the fade-in.
Fade out time:	Duration of the fade-out.
Active level during cross-fade	This function indicates the loudness of the active audio signal during crossfading. Temporally only one default level is available: 0dB (normal loudness).
Inactive level during cross-fade:	This function indicates the level of the inactive signal during crossfading. Temporally only one default level is available: -110dB (silent).

Enter the following data in the menu field shown in Fig. 40 for both audio outputs:

1. Enter the fade-in time in Milliseconds, i.e. the duration of the signal decreasing.
2. Enter the fade-out time in Milliseconds, i.e. the duration of the signal increasing.

⇒ Save the settings by clicking the button.

11.6. Status

11.6.1. SAT Tuner – Tuner Status

This menu item is available under **Status**→**SAT Tuner** and is used to display the status of the tuner. The parameter of the received RF signal and the contained station signals including a signal quality statement (bit error rate) are shown in this menu (see Fig. 41).

SAT Tuner	
C/N:	0dB
CFO Error:	0.0 MHz
Input:	-99 dBm
AGC:	BAD
CE:	BAD
Sym. Time:	BAD
Carr:	BAD
FEC:	BAD
System:	BAD
Puncture Rate:	--
Viterbi/LDPC BER:	--
RS/BCH BER:	--

Fig. 41: Status – SAT Tuner

The following parameters are displayed in this status menu in Fig. 41

C/N:	Calculated carrier/noise ratio of the signal. To avoid data errors, the decoding of a received signal requires a minimum C/N ratio that depends on the FEC rate. Unit: dB
CFO Error:	Carrier Frequency Offset – shows the frequency offset in respect to the current tuner frequency. Unit: MHz
Input:	Level of the RF signal at the "RF-In" input. Unit: dBm
AGC:	Tuner status AGC (Automatic Gain Control). "Bad" or "OK".
CE:	Tuner status CE (Carrier Frequency Offset Estimation). "Bad" or "OK".
Sym. Time:	Tuner status Symbol Timing. "Bad" or "OK" (configured symbol rate is detected).
Carr.:	Tuner status Carrier. "Bad" or "OK" (Phase & Frequency loop locked).

Viterbi (FEC):	Tuner status of the Viterbi error correction. "Bad" or "OK".
System:	Tuner status "Bad" or "OK" (all preceding OK).
Puncture Rate:	Ratio of protection bits and data bits of the Viterbi error correction.
Viterbi/LDPC BER:	Present bit error rate in front of the Viterbi error correction.
RS/BCH BER:	Present bit error rate in front of the Reed Solomon error correction.

11.6.2. TS: display transport stream status

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

The following parameters are displayed in the status menu:

State:	Tuner detected the received data transport stream. "No" or "OK".
NID:	Network Identification: Identity string of the received satellite (e.g. "Astra 19,2E").
Data Rates:	This field shows the current rates of the transport stream over for different TS inputs: Tuner, ASI and IP 1000Base-T.

11.6.3. Audio: display MPEG status

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

The following parameters are displayed in the status menu for both audio channels:

Version:	MPEG version of the received signal.
Layer:	MPEG layer of the received signal or term "AAC".
Bit rate:	Bit rate of the received signal. Unit: bit/s
Sample rate:	Sample rate of the received MPEG signal. Unit: kHz

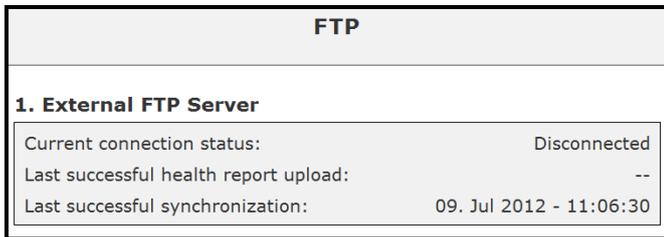
11.6.4. RDS Data

Prerequisite: RDS decoder via web interface

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

11.6.5. FTP: External FTP server status

This menu item is available under **Status→FTP** and is used to display the current connection with the first and the second external FTP server and the time of the last synchronization as well as the time of the last health report upload for each server (see Fig. 42).



FTP	
1. External FTP Server	
Current connection status:	Disconnected
Last successful health report upload:	--
Last successful synchronization:	09. Jul 2012 - 11:06:30

Fig. 42: Status: External FTP Server status.

To set up the connection with external FTP servers see Section 11.4.4.

11.6.6. Scheduler

Prerequisite: MCR20x

This menu item is available under **Status→Scheduler** and is used to display the schedule of the audio files which should be played back from the internal storage of the device (see Fig. 43).



Scheduler					
09. July 2012 - 11:08:06					
09. July 2012					
State	Start	End	Group	Filename	
Waiting	11:00:00	11:15:00	2WCOMA	Party Rock Anthem.mp3	
Waiting	11:30:00	11:45:00	2WCOMA	Fields of Gold.mp3	
10. July 2012					
State	Start	End	Group	Filename	
Waiting	11:44:00	---	2WCOMA	Englishman in New York.mp3	

Fig. 43: Status – Scheduler.

You can define the schedule commandos (destination, filename, start time, duration and event) for playing back audio files from the internal storage via a special MCR scheduling file. The file can consist of multiple lines. Each line refers to one audio file (see Fig. 44). Each commando is separated by the |-Symbol.



Fig. 44: Example of a scheduling file.

The following instructions will help you:

- [to create a scheduling file](#)
- [to upload the scheduling file to the internal storage](#)

To create a scheduling file:

1. Create a new text file, e.g. with Microsoft Editor.
2. Save the file with an extension .SHD
3. Write one of the following commando types for destination on the device:
 - APIDXXXX: will be played on output that is currently using PID XXXX
 - OUTPUT_X: will be played on output X
 - Groupname: will be played on assigned output by a group name
4. Write one of the following commando types for the file name which should be played back (suffix of filename indicates type of file):
 - mp2,mp3,mp4: audio files
 - plst: playlist file
5. Write the start time in the following format: DDMMYY-HHMMSS
6. Write the duration of valid time in seconds:
 - Files are only started when trigger is received within valid time frame.
 - Ignored for TIME event
7. Define the activation event:
 - RLXX: will be triggered by relay cue
 - TIME: will be automatically started at start time
 - PLAY: will be triggered by SIRC play command

You can upload a scheduling file to the internal storage of the device via the following three ways:

1. From an FTP server
2. Via synchronization of the internal audio folder with an external audio folder on the FTP server.
3. Via SIRC, i.e. remote control.

When an audio file from the schedule is being played back, the corresponding entry in the menu is marked green (Fig. 45).

Scheduler				
10. July 2012 - 11:44:42				
10. July 2012				
State	Start	End	Group	Filename
Playing	11:44:00	---	2WCOMA	Englishman in New York.mp3

Fig. 45: Status - Scheduler - active audio file.

11.6.7. Error Log

This menu item is available under **Status→Error Log** and is used to display a log with events that have occurred since the lists last reset. A printable list with a description and a timestamp is shown. You can print it out by clicking the -Button, save as a text file or delete it by clicking the -Button.

12. Interfaces

12.1. RF Inputs

RF - In F-type jack; Input for the connection of the receiving LNB of the satellite antenna. The LNB supply voltage can be set to 13 V, 18 V, or 0 V (off) to set the LNB polarization*. $Z=75 \Omega$.

Admissible RF signal input range -82...-10 dBm

* Depending on the hardware version, the LNB supply voltage may only be present if an LNB is connected.

RF - Bypass No function.

12.2. Audio Outputs

Analog - L 1 /
Analog - R 1 XLR male sockets; Outputs for the analog audio signal 1 with adjustable analog audio level, separately for the left (L) and the right (R) channel. ($Z<20 \Omega$ balanced)

AES/EBU 1 XLR male socket; Output for the digital audio signal 1 with adjustable digital audio level. ($Z=110 \Omega$ balanced)

The sample rate of the signal depends on the received signal. The device supports 8...96 kHz.

Analog - L 2 /
Analog - R 2 XLR male sockets; Outputs for the analog audio signal 2 with adjustable analog audio level, separately for the left (L) and the right (R) channel. ($Z<20 \Omega$ balanced)

AES/EBU 2 XLR male socket; Output for the digital audio signal 2 with adjustable digital audio level. ($Z=110 \Omega$ balanced)

The sample rate of the signal depends on the received signal. The device supports 8...96 kHz.

Headphone jack 6.3 mm / 1/4" jack for the output of the audio signal 1 or 2 with adjustable signal level to connected headphones. (L/R, $Z<10 \Omega$ unbalanced)

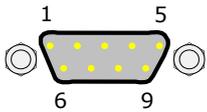
12.3. Ethernet Sockets

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

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

Serial RS-232 Interfaces

DTE 1 / DTE 2



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

Possible baud rates: 1200...115200 Baud.

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

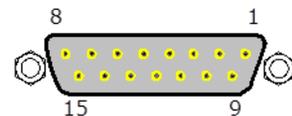
Pin configuration

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

Pin	Function
6	DSR
7	RTS
8	CTS
9	not connected

12.4. Optical Coupler Input

D-Sub female connector, 15 pole



Optical Coupler Input

Optical Coupler No.	Control Pin No.
1	1
2	2

3	3
4	4
5	5
6	6
7	7

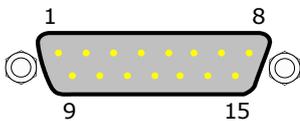
To actuate an optical coupler pull the corresponding control pin electrically to ground (pins 9,10,11,12,13,14,15). The control current is less than 5 mA.

NOTICE

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

12.5. Relay Output

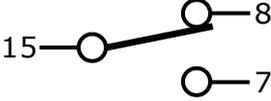
The MCR is either equipped with a D-Sub 15 pole male connector or a high density D-Sub 26 pole male connector on newer hardware revisions for more relay outputs ($\geq V1.22$). Additional relay outputs have to be ordered with the unit or the unit has to be sent back for servicing/upgrading at a later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



Relay Output

D-Sub male connector, 15 pole

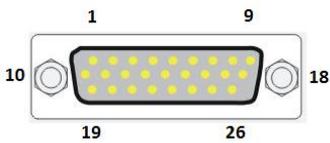
<i>Relay No.</i>	<i>Switch contacts</i>	<i>Switch type</i>
1	1,9	SPST, NO
2	2,10	SPST, NO
3	3,11	SPST, NO
4	4,12	SPST, NO
5	5,13	SPST, NO
6	6,14	SPST, NO

7		SPDT
---	---	------

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

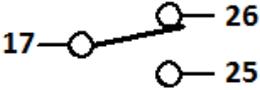
NOTICE

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



D-Sub male connector, high density, 26 pole

Relay Output

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

	12		SPDT
--	----	--	------

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

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

NOTICE

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

12.6. Relay Output controlled by QBIT Q561 inputs

The MCR Relay closures can be remotely controlled by the inputs of the QBIT Q561. To activate the processing of the relay switching commands of the QBIT Q561, the remote control function of the MCR/2 has to be enabled in PID 8190 with private data and elementary stream mode. See section 11.5.6.

13. Maintenance & Servicing

Maintenance

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

Servicing

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

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

Calibration

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

14. Troubleshooting

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

Problem	Possible Cause	Solution
Device does not turn on	<ul style="list-style-type: none"> • Power cable is improperly connected • Mains supply failure • Blown fuse 	<ul style="list-style-type: none"> • Check supply cord • Make sure that the power plug at the device is fully inserted • Check mains supply • Replace fuse by same type
No satellite reception	<ul style="list-style-type: none"> • Antenna cable improperly connected • Alignment of satellite antenna not correct • The LNB outputs an L-band signal with a high frequency offset. 	<ul style="list-style-type: none"> • Connect antenna cable with F-type plug to the RF-In jack of the device. • Precisely align the satellite antenna to satellite azimuth and elevation setting with the lobe area free of obstacles. • Try to alter the tuner frequency ± 250 kHz, use a high quality LNB.
Faulty reception	<ul style="list-style-type: none"> • L-Band signal interference 	<ul style="list-style-type: none"> • Use only high quality, double-shielded antenna cable to avoid coupling of other signals (e.g. DECT cordless phones, GSM1800/1900 mobile phones etc.).
Device cannot be operated via Ethernet	<ul style="list-style-type: none"> • Network cable not connected • IP address / TCP port is not known. • A device with the same IP address was connected a few minutes before. Then the ARP table still assigns the old MAC address to the IP address. 	<ul style="list-style-type: none"> • Connect the network cable. • Use the default address 192.168.14.250. If the address was changed and is not known please see page 71. • Usually the ARP table is refreshed automatically after a few minutes by the operation system. For an instant access to the device please reset the ARP table of your computer e.g. by entering "arp -d" in the Windows Command Prompt.