MAINTENANCE AND OPERATION
INSTRUCTION MANUAL

DB7008

Advanced FM and DAB/DAB+
Re-Broadcast Receiver
with IP Audio & MP3 Backup Players

DAB+

DEVA® BROADCAST

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Introduction

DEVA Broadcast Ltd. is an international communications and high-technology manufacturing organization, its corporate headquarters and facility located in Burgas, Bulgaria. The company serves the broadcast and corporate markets worldwide – from consumers and small businesses to the largest global organizations. It is dedicated to the research, design, development and provision of advanced products, systems and services. DEVA Broadcast launched its own brand back in 1997 and has nowadays evolved to become known as a market leader and internationally reputed manufacturer of user-friendly, cost-effective and innovative broadcast products.

Creativity and innovation are deeply woven into DEVA Broadcast corporate culture. Through successful engineering, marketing and management our team of dedicated professionals creates future-oriented solutions to improve customers' performance. You may rely that all issues communicated to our crew would be addressed accordingly. We pride ourselves on our pre and post-sales support and purchase services, which along with the outstanding quality of our radio gear have won us due respect and the market authority position.

DEVA Broadcast best-of-breed solutions have become the best sellers for our partners. The strategic partnerships which have been formed with industry leaders during all these years that we have been operating on the broadcasting market, have proved us a reliable business partner and a valuable asset, as our dealers worldwide would confirm. In constant pursuit of precision and long-term satisfaction, DEVA Broadcast enhances the reputation of our partners and clients alike. Furthermore, we have already a proven merit as a credible partner provider.

Our portfolio offers complete line of high quality and competitive products for FM and Digital Radio, Radio Networks, Telecommunication Operators and regulation authorities. For almost two decades of intensive software and hardware development, we have achieved a unique price-performance and endurance of our product lines. Our company's multitude of equipment and services is in line with the latest technologies and key trends. The most recognizable characteristics attributed to DEVA Broadcast products are their clear-cut, streamlined design, easiness of use and cost-effectiveness: simplicity of forms but multiplicity of functions.

For us there is no stage when we deem that we have reached the most satisfactory level in our work. Our engineers are in constant pursuit of new ideas and technologies to be captured in DEVA Broadcast solutions. Simultaneously, a strict control is being exercised at each step of any new development. Experience and hard work are our fundament but the continuous improving process is what we never leave aside. DEVA Broadcast participates on a regular basis in all landmark broadcasting events, not only to promote its products, but to exchange valuable know-how and experience. We are also engaged in international large-scale projects involving radio and audio solutions which makes us even more competitive on the global market.

All DEVA Broadcast products are developed and produced in accordance with the latest ISO 9001 quality control standards.

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Typographic conventions

The following table describes important conventions used in the manual.

Convention and Style	Description	Examples
Menu > Sub Menu > Menu Command	A menu item(s) and menu command that you need to click in sequence	Click ***Settings > General***
[Button]	Interface Interactive buttons	Press [OK] to save the changes
NOTE	Important notes and recommendations	**NOTE:** The notification will appear only once
"Reference Name" on Page XXX	References and links	refer to "New Connection" (see "Monitoring" on page 56)
`Example`	Used when example text is cited	Example for E-mail Notification: `Date: 04 Nov 2013, 07:31:11`

General Information

The DB7008 Rebroadcast Receiver is a next-generation solution engineered to deliver high-precision FM and DAB/DAB+ signal reception, monitoring and continuous rebroadcasting within a single professional platform. Built on a powerful DSP architecture and advanced RF front end, it ensures reliable operation even under demanding broadcast conditions.

Thanks to the built-in monitoring system, upon DAB/DAB+ audio loss at the inputs, DB7008 will not only notify the maintenance staff, but will also automatically switch to a back-up FM Station. In case a fail of the FM station is detected, DB7008 will shift to the incorporated IP Stream, MP3/AAC back-up audio source player. It is essential that the back-up sources priority is user-defined. The audio files and playlists can be uploaded in the device's internal memory directly from your PC, via any FTP client. When the signal at the default input is restored, the DB7008 will automatically switch back to it. Depending on your preferences, several types of alarm notifications are utilized - E-mail, SNMP and SMS (via the optional GSM modem).

Operation is straightforward thanks to the intuitive front-panel interface, sharp OLED display and bright LED level meters. Remote management is fully supported through a responsive web interface compatible with desktop and mobile devices. Integrated SNMP, e-mail and GPO alarms ensure immediate notification of signal issues, making the DB7008 a dependable component in any professional broadcast infrastructure.

Reliable, versatile and engineered for precision, the DB7008 is well suited for broadcasters requiring uninterrupted service, accurate monitoring and metadata consistency across FM and DAB/DAB+ platforms.

Product Features

- High-End Digital DAB/DAB+ Tuner
- ETSI EN 300 401 Compliant
- Program Associated Data (PAD) Support
- Full Component Information including Ensemble, Service, Subchannel, Metadata
- Automatic Display of Live PAD Information
- FM Band 87.1 - 108 MHz with Basic Spectrum Analyzer
- Up to 100 dBµV Direct RF Antenna Input
- Selectable Wide-Range IF Filter Bandwidth
- Fully DSP-Based Signal Processing
- Bright LED Bar Graph Meters for RF, MPX and Audio Levels
- Selectable De-emphasis
- Built-in Stereo Decoder
- RDS/RBDS Decoder with BER Meter
- Real-Time Audio Streaming for Remote Listening
- High-Stability RF Front End for Reliable Rebroadcasting
- Low-Noise, High-Quality Audio Output Paths for Re-Emission
- Configurable Backup Sources (FM ↔ DAB/DAB+)
- Automatic Source Switching with Adjustable Thresholds
- Protected Access to Device Settings
- Balanced Analog Audio Outputs (XLR) with Adjustable Level
- Professional AES/EBU Digital Output
- Headphone Output with Front-Panel Level Control
- SNTP for Automatic Clock Synchronization
- LAN Port for Full TCP/IP Remote Control and Monitoring
- Built-in Web and FTP Servers with no additional software required
- Easy-to-Use Web Interface with Apple and Android Device Support
- Adjustable MIN/MAX Alarms for RF, DAB, SNR, CNR, MPX, RDS, L/R Audio Levels.
- Alarm Dispatch via E-mail, SNMP v2C and Rear-Panel GPO Outputs
- Detailed Error and Status Logging
- Wide-Angle OLED Display for Instant Local Readout
- Intuitive Front-Panel Navigation with Soft Keys
- Accurate Front-Panel RF and Audio Metering
- Firmware Updates for Continuous Feature Improvements
- Restore Factory Parameters Option
- Easy Installation and Setup

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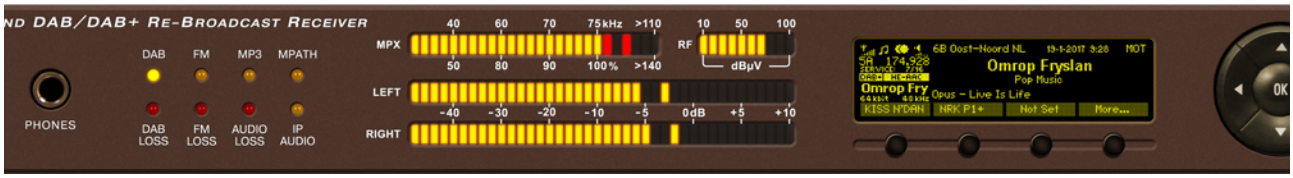
TECHNICAL SPECIFICATIONS

DAB/DAB+ RADIO INPUT	
RF frequency range	168 - 240 MHz
DAB/DAB+	Band III Channels 5A - 13F
Sensitivity	18 dBµV
Input connector	BNC 50Ω
In compliance with	ETSI EN 300 401
Ensemble acquisition Time	940 ms
L&R Audio	1%, +5.0 to -50.0 dB, 0.1 dB resolution
DAB/DAB+ RADIO METERING	
Quality indicators	RSSI, SNR, CNR, FIC Quality, FFT Offset
PAD	DLS, MOT
Metadata Displayed	Ensemble Label, Component List & ID, Service List & ID, Dynamic Label, PTY, Sample Rate, Bit Rate, Gain, Mode, Service Mode, Protection Info, Current CU & Address, Country, Language, Time & Date
FM RADIO INPUT	
Tuning Range	87.1-108 MHz (CCIR)
Tuning Step	10, 20, 50, 100 kHz
Tuner Sensitivity	30 dBµV
Antenna Ports	BNC Connector, 50Ω
Antenna Ports Isolation	> 40 dB
Dynamic range	100 dB
FM DEMOD	
IF Filter Bandwindth	15 Increments (27kHz - 157kHz, Auto)
Dynamic range	90 dB
STEREO DECODER	
Frequency Response (L and R)	±0.1 dB, 10 Hz to 15 kHz
SNR (Stereo)	60 dB, 50 µs de-emphasis
THD	0.15% @ 1kHz, 0.4% from 10 Hz to 15 kHz, 50 µs de-emphasis
Separation	50 dB, 50 Hz to 10 kHz, 50 µs de-emphasis
Crosstalk	52 dB
RDS DECODER	
Standards	European RDS CENELEC; United States RBDS NRSC
PI, PS, RT	Yes
FM RADIO METERING	
RF Level	±1 dB, 0 to 100 dBµV
Audio	±1 dB, +10.0 to -55.0 dB, 0.1 dB resolution

OUTPUTS	
Composite	+12 dBu @ 75kHz, 75Ω, unbalanced BNC Connector
Audio (L, R)	+6 dBu, 600Ω, balanced XLR Connector
AES3 (L, R)	5.0 Vp-p, 110Ω, balanced XLR Connector
SPDIF (L, R)	3.0 Vp-p, 110Ω, unbalanced BNC Connector
Optical (L, R)	Transmitter, TOSLINK
Alarms	Programmable terminals on rear panel, optoisolated
Headphone	6,3mm (1/4") Phone Jack
COMMUNICATION INTERFACES	
Ethernet 10/100 Base-T	RJ45 Connector
MEASUREMENT STORAGE	
Storage	Build-in Memory Card
Data format	Text, CSV
OPERATING CONDITIONS	
Temperature	-15°C to 55°C
Humidity	< 95%, non-condensing
Altitude	0 to 5000m above sea level
POWER	
Voltage	100-240V / 50-60 Hz
Power Consumption	20VA
Connector	IEC320, Fused and EMI-suppressed
SIZE AND WEIGHT	
Dimensions (W;H;D)	485 x 44 x 180 mm
Shipping Weight	540 x 115 x 300 mm / 2.700 kg

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Panel Indicators, Switches and Connectors



INDICATORS

DAB – indicates that the DAB/DAB+ station is the current audio source.

FM – indicates that the FM station is the current audio source.

MP3 – indicates that the Backup player is the current audio source.

IP Audio – indicates that either the IP Audio Client or the RTP Receiver is the current audio source.

DAB Loss – will be indicated whenever there is no DAB/DAB+ signal lock and valid multiplex stream data.

FM Loss – will be indicated whenever the level of the RF signal of the Main Station drops below the selected threshold. The RF LOSS detection threshold and time can be set trough: ***Settings> Main Station> RF Loss Threshold / RF Loss Timeout***.

AUDIO Loss – will be indicated whenever the level of the Left and Right audio channels drops below the selected threshold. The AUDIO LOSS detection threshold and time can be set trough: ***Settings> Device> Loss> Audio Threshold / Audio Timeout***

MPATH – Indicates the presence of strong multipath distortion of the RF signal. The indication threshold and time can be set trough: ***Settings> Device> Loss> Multipath Threshold / Multipath Timeout***

OLED DISPLAY

DB7008 has easy to read, high-resolution OLED graphical display that visualizes all measurements of the received signal and DB7008's settings.

LED METERS

The full-time LED meters allow quick and easy monitoring of the metering, making the setup, adjustment and programming easy.

CONTEXT-SENSITIVE SOFT BUTTONS

Used for navigation through the menus, quick access to the parameters, modes, functions and to alter their values. The soft buttons indicators are placed on the bottom side of the OLED display. Depending on the currently selected menu context the indicators change their function. The soft buttons will be referred as (left-to-right) [SB1], [SB2], [SB3] and [SB4].

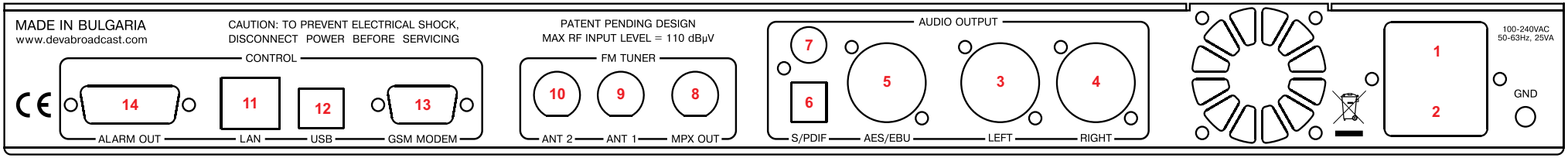
NAVIGATIONAL BUTTONS

[UP], [DOWN], [LEFT], [RIGHT] and [OK] buttons, are used to navigate through the menus selecting various functions and parameters of DB7008.

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REAR PANEL

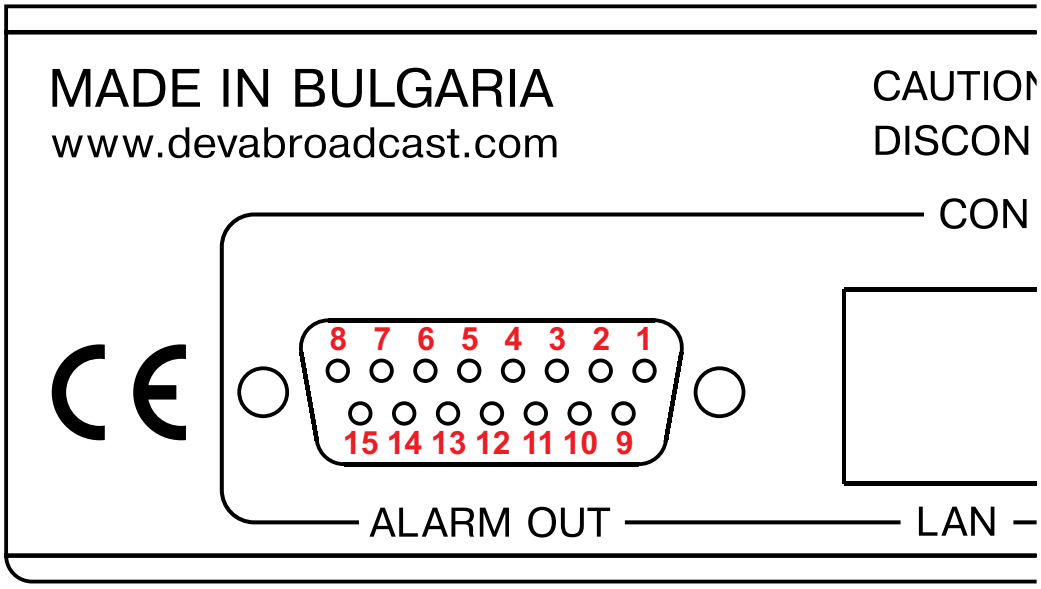




1. Mains connector, 110-240VAC, IEC-320 C14 type;
2. Fuse holder – 1A;
3. Audio Left Output - XLR;
4. Audio Right Output - XLR;
5. Audio AES/EBU Output - XLR;
6. Audio SPDIF Output - RCA;
7. Audio Optical Output - TOSLINK;
8. MPX Output - BNC;
9. FM Radio Input (Antenna 1) - BNC;
10. DAB/DAB+ Radio Input (Antenna 2) - BNC;
11. Ethernet T-BASE10/100 RJ45;
12. USB – type B;
13. GSM Modem – Male D-Sub 15 pins High Density;
14. GPO – Opto-isolated, Female D-Sub 15 pins.

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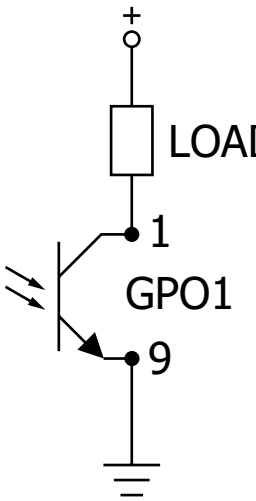
REAR PANEL ALARM TERMINAL

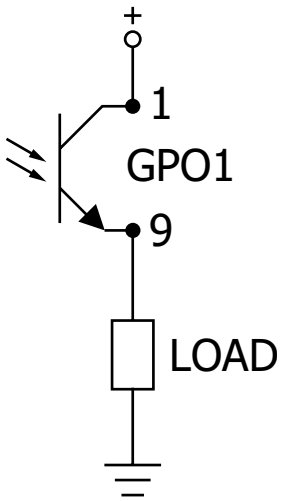


1 - GPO1 Collector
2 - GPO2 Collector
3 - GPO3 Collector
4 - GPO4 Collector
5 - GPO5 Collector
6 - GPO6 Collector
7 - GPO7 Collector

8 - GND

9 - GPO1 Emitter
10 - GPO2 Emitter
11 - GPO3 Emitter
12 - GPO4 Emitter
13 - GPO5 Emitter
14 - GPO6 Emitter
15 - GPO7 Emitter





Safety Warning

ALWAYS OBSERVE THE SAFETY PRECAUTIONS.

Careful observance of the safety precautions will help prevent physical injury, damage of the equipment, and extend the equipment life.

- The servicing of electronic equipment should be performed only by qualified personnel;
- Before removing the covers the unit must be switched off and the mains cable unplugged;
- When the equipment is open, the power supply capacitors should be discharged using a suitable resistor;
- Never touch the wires or the electrical circuits;
- Use insulated tools only;
- Never touch the metal semiconductor. They might carry high voltages;
- For removing and installing electronic components, follow the recommendations for handling MOS components.
- Do not remove the factory sticker from the equipment. It contains information as regards the name, serial number and MAC address of the device.
- To join the equipment to the mains supply, use the power cord purchased with the equipment.

ATTENTION: The device has an internal Lithium battery for RTC timekeeping. Do not try to re-charge this battery!

NOTE: A depleted RTC battery may cause the device to start with an incorrect or random time and date. For the RTC battery replacement procedure, refer to APPENDIX "Battery Replacement Procedure" on page 66.

Operating Recommendations

To ensure normal operation of the DEVA unit, we recommend following the instructions listed below.

- Install the unit in places with good air conditioning. The unit is designed to operate within the ambient temperature range of 10 to 50°C. The equipment rack should be ventilated in order for the device to keep its internal temperature below the maximum ambient temperatures;
- We do not recommend installation in rooms with high humidity, dusty places or other aggressive conditions;
- Although the device is intended to be installed closed to exciters or transmitters, we do recommend the device to be located away from abnormally high RF fields.
- Use only checked power supply cables. We strongly recommend the usage of shielded cables;
- Connect the DEVA unit to reliable power supply sources only. In case of unstable power supply, please use Uninterruptible Power Supply (UPS);
- Use the device only with its top cover on to avoid electromagnetic anomalies. Otherwise, this may cause problems with the normal functionality of the unit;
- To ensure normal remote operation of the unit, make sure to connect the device to a good quality Internet connection;
- For the normal operation of your DEVA device, check if the network settings past through all the required data traffic.

Unpacking and inspection

Upon receipt, the equipment should be inspected for possible shipping damages. If such are found or suspected, notify the carrier at once and contact DEVA Broadcast Ltd. The original shipping carton box and packing materials should be kept for possible reuse, in case of return for Warranty repair, for example. Shipping damages as a result of improper packing for return may invalidate the Warranty!

The packing material (plastic bags, polystyrene, nails, etc.) must never be left within reach of children, as these items are potential sources of danger.

IT IS VERY IMPORTANT that the "Product Registration Card" included in the Manual be completed accurately and returned. This will assure coverage of the terms of the Warranty and it will provide a means of trace in case of lost or stolen equipment. In addition, the user will automatically receive SERVICE OR MODIFICATION INSTRUCTIONS from DEVA Broadcast Ltd.

Mounting

RACK REQUIREMENTS 1U

The unit mounts in a standard 19-inch equipment rack and requires only 1¾ inches (1U) of vertical rack space. In order the painted finish around the mounting holes to be protected, the use of plastic washers is recommended.

RACK REQUIREMENTS COMPACT UNITS

Our customized 1U 19-inch rack accessory provides a professional mounting option for up to three compact size DEVA units. It is made of milled aluminum and finished in black powder coat. Two extra blanking panels and set of mounting screws are provided with each rack bracket kit.

STAND-ALONE DEVICES

DEVA's stand-alone units (Radio Explorer series, BandScanner series, DVB Explorer) do not require additional tools or installation brackets.

RF ENVIRONMENT – PRECAUTIONS, INSTALLATION SPECIFICATIONS AND ANTENNA TYPES

The observation of the RF Environment, in which DB7008 is functioning, is necessary for ensuring normal and reliable function of the device. In order for the device to work properly, the best conditions according the standards listed below should be provided.

The usage of an external antenna is required because DB7008 is used for off air re-broadcasting away from the transmitter site. Proper outdoor FM antenna, antenna location and direction should be selected. The three most popular antenna types are: omni directional, unidirectional dipole and directional multi-element array antenna.

Because of the low antenna gain, the bad signal to noise ratio (compared to any directional antenna) and its high multipath interfaces reception, we do not recommend the usage of omni directional antenna with DB7008.

The other type antennas: unidirectional dipole and directional multi-element array antenna are much proper for your needs. We recommend the usage of antenna systems designed respectfully for the DAB/DAB+ and FM radio bands.

The recommended working RF level is in the range 40-70bBµV for DAB/DAB+ tuner and 55-90dBµV for the FM tuner. If the input RF level is above these ranges, we recommend using external RF attenuators with appropriate value.

After selecting the antenna type that will meet your needs, the next step is its installation. The following important principles should be considered:

- Install the antenna far enough from walls, roofs, buildings or any transmitting equipment;
- The minimum spacing between the antenna and the closest object should be more than 3 meters.

One unit DB7008 re-broadcast receiver is used for re-broadcasting of one transmitter site, transmitting more than one program. In such cases, the best antenna that can be used is a directional antenna directed exactly to this site.

DE-EMPHASIS AND PRE-EMPHASIS SELECTION

As well known, there are three different de-emphasis selections. One of the problems with the high quality VHF FM transmissions is that the increased audio bandwidth means that background noise can often be perceived. It is particularly noticeable towards the treble end of the audio spectrum, where it can be heard as a background hiss. To overcome this, it is possible to increase the level of the treble frequencies at the transmitter. The frequencies are correspondingly attenuated at the receiver in order to restore the balance. This also has the effect of reducing the treble background hiss which is generated in the receiver. The process of increasing the treble signals is called pre-emphasis, and reducing the treble signals in the receiver is called de-emphasis. The rate of pre-emphasis and de-emphasis is expressed as a time constant. It is the time constant of the capacitor-resistor network used to give the required level of change.

In UK, Europe and Australia the time constant is 50µs whereas in North America it is 75µs. The de-emphasis and pre-emphasis should be selected depending on the region you are located or can be disabled.

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AC Mains Power

FUSE HOLDER

The fuse holder is placed inside the unit, next to the voltage selector. Apply downward pressure and pull the cap outward to access the 5mm mains fuse. The reverse process will release the cap.

MAINS VOLTAGE SELECTOR

Before connecting the AC Power, make sure that the internal Power Switch is in accordance with the mains supply at your location. The Power Supply Factory Settings are:

- 100 - 240 VAC
- 1 Amp Fuse

CAUTION: Permanent damage will result if improper AC supply voltage is applied to the device. The warranty DOES NOT cover damages caused by applying improper supply voltage or usage of improper fuse.

POWER CORD

The detachable IEC-type power cord is supplied with the unit. The individual cord conductors may be color-coded in either of two ways:

1) In accordance with US standards:
BLACK = AC “HOT”
WHITE = AC NEUTRAL
GREEN = EARTH GROUND

2) To European CEE standards:
BROWN = AC “HOT”
BLUE = AC NEUTRAL
GREEN/YELLOW = EARTH GROUND

GROUND LOOPS

Because the unbalanced INPUTS/OUTPUTS of the device are chassis-ground-referenced, a mains frequency or INPUT/OUTPUT ground loop could be formed between the input or output cable shield grounds and the AC power cord ground. A ‘ground-lifting’ AC adapter may help in this situation, although the chassis must be properly grounded for safety purposes. In general, the equipment being installed in a rack will satisfy the safety requirement.

Getting Started

In order for the normal operation of the DB7008 to be guaranteed, you will need fulfill the following conditions:

1. Standard Ethernet 10/100M connection;
2. Correctly assigned Network configuration and device settings.

To make sure that all the conditions are fulfilled please, follow the instructions below.

CONNECTION

1. Install the unit on its operation place;
2. Using the provided power cable, connect the unit to the power supply network;
3. Connect the antenna cable to the RF antenna input connector located on the rear panel of the device;
4. Connect the DB7008 to the TCP/IP network using direct network cable;
5. **IF GSM OPTION IS SUPPORTED** - Using the connection cable provided, connect the optional GSM modem. In order for better GSM network coverage to be achieved, please select proper place for the GSM antenna.

NOTE: The GSM antenna must be installed far enough from the monitoring devices. The GSM modem radiates RF signal that may cause spurious emissions that will may interfere with the accuracy of the measurements.

NETWORK SETTINGS

After connecting the network cable the Led 'LAN' located on the rear panel must be ON or flashing. The next and most important step for configuration is the adjustment procedure of the Network Communication. The settings shown below are Default Network Settings:

DHCP	Enabled
IP	Assigned by DHCP
Mask	Assigned by DHCP
Gateway	Assigned by DHCP
DNS	Assigned by DHCP
HTTP Port	80

NETWORK DISCOVERY

This is a network setting that defines whether your computer can see (find) other computers and devices on the network and whether other computers on the network can see your computer. By default, Windows Firewall blocks network discovery but you can enable it.

1. Open Advanced sharing settings by clicking the Start button, and then on "Control Panel". In the search box, type "network", click "Network and Sharing Center", and then, in the left pane click "Change advanced sharing settings";
2. Select your current network profile;
3. Click "Turn on network discovery", and then click save changes.

NOTE: If you're prompted for an administrator password or confirmation, type the password, provide confirmation or contact your system administrator.

If you have already enabled this function on your computer DB7008 will be automatically added to the Device list section. The device will be ready for usage and no additional adjustments will be required except user name and password.

NOTE: If the port is different than the default one (80), it is necessary to specify it, for example: `http://192.168.1.2:9000`

ATTENTION: Depending on Internet Protocol Settings, the assigned IP address may not be visible outside your local network, thus the device may be accessed only within that network. Consult with your network administrator for the appropriate IP settings.

NETWORK SECURITY RECOMMENDATIONS

1. It is not recommended the DB7008 to be directly connected to the Internet. This may lead to unregulated access and/or problematic operation of the device. To ensure secure connection, we recommend the device to be installed behind a router with an active firewall.
2. If remote access to the device is needed, we recommend using VPN to the router or the port of the relevant service (WEB, SNMP, Application, etc.) to be properly NAT forwarded.
3. If NAT forward is used, it is highly recommended random ports of your choice to be used. Not the standard ones (80 for WEB, 161 for SNMP, etc.).
4. Using DMZ connection is not recommended.
5. Make sure to change the standard access credentials (usernames and passwords, SNMP communities).

For detailed information as regards the recommendations listed above or need of further instructions, please contact your network administrator.

Operation

FIRST TIME POWER ON

This chapter will guide you through the initial set up of DB7008 FM Radio re-Broadcast Receiver. Applying these principles, you can simplify the process and save yourself extra time and effort.

The items needed for the configuration are a pair of headphones and connection to an outdoor antenna. The different types of antenna are described previously in this manual (see “RF Environment - precautions, installation specifications and antenna types” on page 18)

1. Install the unit on its operation place;
2. Before connecting the AC Power, make sure that the fuse rating is in accordance with the mains supply at your location. DB7008 Power Supply Factory Settings are: 100-240 VAC; 1Amp Fuse;
3. Connect the antenna cable to the RF antenna input connector located on the rear panel of the device;
4. Plug the headphones into the front panel jack;
5. Use the front panel navigational menu to set the desired station – Settings> Tuner> Frequency. The station should be clearly heard through the phones. If needed, reposition the antenna in order to improve the reception.

These are the first basic steps in DB7008 operation. Detailed explanation on how to configure and explore your device is given in the next chapters.

Basic Setup

OLED DISPLAY

DB7008 has an easy to read, high-resolution OLED graphical display that visualizes all measurements of the received signal and settings. Upon switching it on, the Company Logo and model of the device will be displayed. After a few seconds the start-up screen will disappear, replaced by the main screen. This is the starting point of the navigation process.

DB7008's OLED display has three function areas: header, soft buttons and main screen working area.

HOW TO CHANGE DEVICE PARAMETERS

Set-up menu title

Shows the path to the currently selected menu. Note that the parameter should be included in the settings menu title. For example: ***Setup> Communication> HTTP> Port*** is different from ***Setup> Communication> FTP> Data Port***.

Navigation area

Selection of branches / parameters is made in this area. The selected item is highlighted. All parameters are listed on the left side of the navigational area. All parameter values are displayed on the right side against the parameter name. As the branches have no values associated, tree dots are shown instead. This indicates that a transition to a sub-menu is available.

Front panel buttons usage:

[OK] – Depending on the selected menu element can perform different actions:

- Menu branch – transition to selected sub-menu will be made;
- Menu parameter – when a name of a parameter is highlighted pressing [OK] will highlight the value and switch to edit mode;
- Menu complex parameter (such as ***Alarm***) – the parameter editor screen will be shown.

[UP] / [DOWN] – If edit mode is active, the value of the selected parameter will be changed. Otherwise, are used for navigation through the menu;

[LEFT] / [RIGHT] – Change the selection when the parameter value is in edit mode;

[SB4] – Return one level up or cancel edit mode.

There are several parameter types available in DB7008. The way of editing depends of the parameter type. Every parameter type has its own editing rules.

Numerical parameter

Represents numerical value.

Example: The value ***Frequency*** can be changed in the range of **87.10 MHz** to **108.10 MHz** and ***Frequency Step*** of **10 kHz**, **20 kHz**, **50 kHz** or **100 kHz**.

Front panel buttons usage:

[UP] / [DOWN] – Change the value of the parameter with one step. The step value may vary depending on the selected parameter. The value always stays in permitted parameter range;

[OK] – Accept the changed value and exit edit mode;

[SB4] – will discard the value and cancel edit mode.

Enumerated parameter

Represent the selection of a value among set of predefined enumerated values.

Example: The value ***Attenuator*** can be selected from **Auto**, **OFF**, **-10dB**, **-20dB** and **-30dB**.

Front panel buttons usage:

[UP] / [DOWN] – Cycle through the possible values;

[OK] – Accept the changed value and exit edit mode;

[SB4] – will discard the value and cancel edit mode.

IP address

Represents an IPv4 address.

Example: 

Front panel buttons usage:

[LEFT] / [RIGHT] – Select edit marker position;

[UP] / [DOWN] – Cycle through the possible values;

[OK] – Accept the changed value and exit edit mode;

[SB4] – Discards all changes and cancels edit mode.

IP port

Represents TCP or UDP port.

Example: 

Front panel buttons usage: Refer to IP address.

Date

Represent date from the calendar.

Example: 

Front panel buttons usage:

[LEFT] / [RIGHT] – Selects previous/next segment from the date;

[UP] / [DOWN] – Cycle through the possible values;

[OK] – Accept the changed value and exit edit mode;

[SB4] – Discards all changes and cancels edit mode.

Time

Represent time information.

Example: 

Front panel buttons usage: Refer to Date.

Timer

Represents relative time interval.

Example: Screen Saver 2 min

Front panel buttons usage:

[UP] / [DOWN] – Increments/decrements value with one step. The unit value will be changed automatically from seconds to minutes and vice-versa;

[OK] – Accept the changed value and exit edit mode;

[SB4] – Discards all changes and cancels edit mode.

String

Represents string.

Example: User Name user

Front panel buttons usage:

[LEFT] / [RIGHT] – Select edit marker position. If [RIGHT] button is pressed when the marker is at the last character, a space character will be added at the end of the string. When the [LEFT] button is pressed all trailing spaces will be removed;

[UP] / [DOWN] – Cycle through the possible values. Depending on the string context there is a limitation in the permitted char set. For example phone number string can contain only `1234567890+` and blank space characters;

[OK] – Accept the changed value and exit edit mode. Some strings, like e-mail addresses, must pass a validation check. If the validation fails, message box will appear. Press [OK] to dismiss the message. Note that edit mode will not be left. For example:



If [OK] is pressed



If [OK] is pressed



[Insert] – Inserts blank space before the selected character:

User Name us2r – before

User Name us er – after

[Delete] – Deletes the selected character:

User Name us2r – before

User Name usr – after

[Cancel] – Discards all changes and cancels edit mode.

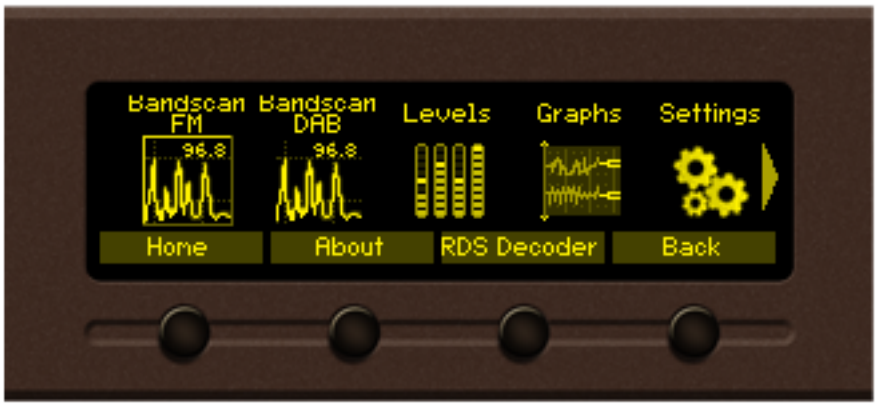
HOME SCREEN

The home screen contains all the needed information as regards the signal received. The header is located on the left part of the screen. The header content is determined according to the work area context and may include the functions described below.



1. Parameter FIC quality (0 to 100%)
2. Audio transmit mode
3. Channel mode – Mono, Stereo, Dual channels. The graphic indicator will change depending on the channel mode.
4. Speakers volume indicator (0 to 100%)
5. Channel number
6. Channel frequency (in MHz)
7. Indicates the current service chosen, and the number of services available
8. Indicates whether the device is in DAB or DAB+ mode
9. Indicates the audio codec in use
10. Service name
11. Bit Rate and Sample Rate
12. Ensemble name
13. Date and Time – transmitted by DAB/DAB+
14. Indicates whether there is multimedia object transport (MOT) at the current service
15. Genre
16. DLS

MAIN SCREEN WORKING AREA



The main part of the OLED screen is where the data changes dynamically, depending on the selected operating mode. The ***Menu*** screen (shown above) appears upon pressing of the [OK] button. DB7008's ***Menu*** page contains selectable icons and soft buttons for selecting modes and functions. Pressing [LEFT] and [RIGHT] arrow buttons will change the icon selection on the ***Menu*** page. The current selection is shown as a rectangle focus frame around the icon. Pressing [OK] button will navigate to the corresponding page.

SOFT BUTTONS

Used for navigation through the menus, quick access to the parameters, modes, functions and to alter their values. The soft buttons indicators are placed on the bottom side of the OLED display.

Depending on the currently selected menu context, the indicators change their function. The soft buttons will be referred to as (left-to-right) [SB1], [SB2], [SB3] and [SB4]. The purpose of all soft button corresponds to the selected menu page. Most pages have the same or similar functional areas. The corresponding functions as Menu page, parameter to be changed, etc., linked with the soft buttons will appear as labels above them. For example:

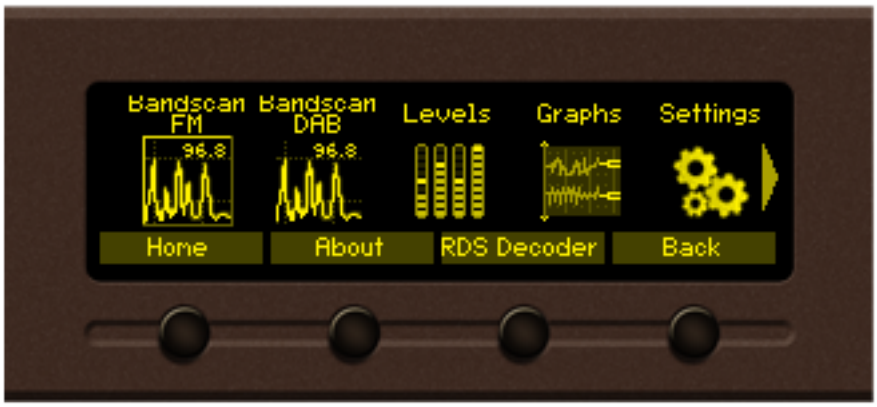
[SB1] – ***Home***
[SB2] – ***About***
[SB3] – Unused
[SB4] – ***Back***

NOTE: On some pages, the header and soft button area will disappear in order to expose the content underneath.

NAVIGATION BUTTONS

[UP], [DOWN], [LEFT], [RIGHT] and [OK] buttons are used to navigate through the menus, for selecting various functions and parameters of DB7008. The main menu structure has an up-and-down basis, expanded with left-to-right branches.

MENU PAGES



SETTINGS

Enter the main ***Menu*** page, select Settings icon and press [OK].



The ***Setup*** menu is organized into a hierarchical tree menu and all similar parameters are grouped into sections (branches).

SECURITY

Keyboard lock

To prevent unauthorized local access, the DB7008 offers password protected keyboard locking. By default the keyboard is unprotected. To enable this function, using the front panel navigational menu, go to ***Setup> Security> Front Panel***, then press [OK] and **Enable** the ***Access Control*** function. Set the preferred 5 digit password and ***Access Timeout***. Once the keyboard lock function is enabled, every attempt to use it will require a password:

`ENTER PASSWORD:0****`. Access will be denied upon false entry.

Keyboard unlock

If the keyboard unlock function has been activated by mistake, try to unlock it using the default password **01234**. In order to deactivate the code protection, once the front panel menu is unlocked follow the menu path ***Setup> Security> Front Panel> Access Control*** and then select **Disabled**. If you do not manage to unlock the front panel with the default password, nevertheless whether it has been changed intentionally or not, DB7008 should be returned to its factory defaults in order for the password security to be disabled.

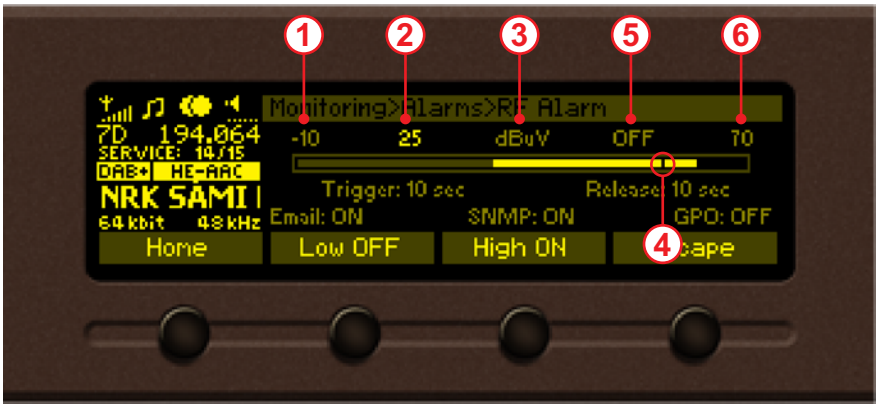
NOTE: The password consists of 5 digits. The leading zeroes are not shown in the menu, but should be specified when entering the unlock password. For example, if your password is `123`, when entering the password `00123` should be written.

ALARMS

Alarms is a special parameter type with its own dialog editor. Each alarm parameter is composed of the following sub-parameters:

- **Alarm Low threshold** – the lower alarm limit of the measured signal. If the value stays below this limit for predefined time "low alarm" event will be generated;
- **Alarm High threshold** – the higher alarm limit of the measured signal. If the value stays above this limit for predefined time "high alarm" event will be generated;
- **Trigger time** – waiting time before a "low alarm" or "high alarm" event is generated;
- **Release time** – waiting time before an "Idle alarm" event is generated;
- **Set of notification channels** – In case of alarm, maintenance staff will be immediately alerted via E-mail, SNMP or GPO, which allows technicians to restore the normal service as soon as possible.

Alarms set-up – Option 1



The bar graph indicates the signal range of the alarm. The highlighted area represents the permitted signal value range. If current signal value (pos. 4) is in this range, no alarm event will be generated. Basic elements of the alarm editor dialog:

1. Lower limit of the alarm range;
2. Low threshold value;
3. Measurement unit;
4. Current value of the signal;
5. High threshold;
6. Higher limit of the alarm range.

Alarms set-up – Option 2



The basic elements of the alarm editor dialog are:

1. Alarm turned ON/OFF;
2. Trigger time (default value is set to 20 seconds);
3. Release time (default value is set to 26 seconds).

Alarm edit dialog, front panel buttons usage:

[LEFT] / [RIGHT] – Selects previous/next sub-parameter of the alarm.

[UP] / [DOWN] – Change the value of the selected (highlighted) sub-parameter. The value always stays in the permitted parameter range. Low threshold value cannot exceed the high threshold and vice-versa;

[OK] – Accept the value and exits edit dialog;

[SB2] – Toggles ON/OFF the low alarm generation;

[SB3] – Toggles ON/OFF the high alarm event generation;

[SB4] – Discards all changes and cancels edit mode.

Buttons [SB2] “Low On/Off” and [SB3] “High On/Off” toggle the state of the corresponding Alarm and Warning limits, ex.:

- Both Alarm Low and Warning Low limits are Off;
- Alarm Low limit is On, Warning Low limit if Off;
- Alarm Low limit is Off, Warning Low limit if On;
- Both Alarm Low and Warning Low limits are On.

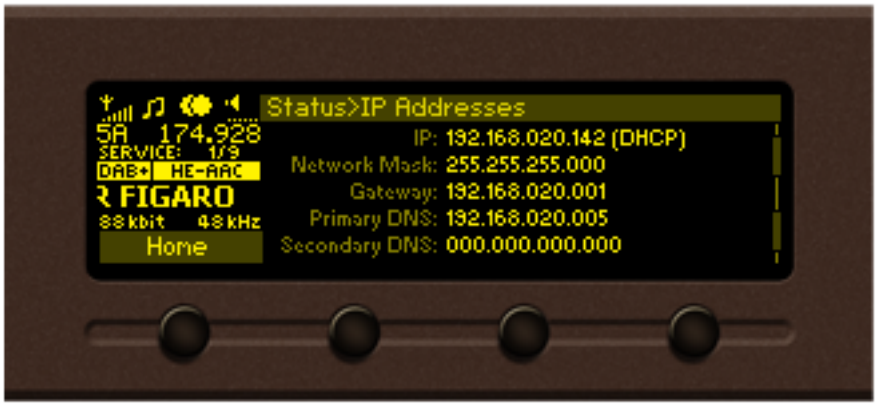
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STATUS

The basic/general information on the device is found here:

- Device – Model, Serial number, Firmware version in use, Calibration, Storage capacity;
- IP address – IP, Network Mask, Gateway, Primary DNS, Secondary DNS;





WEB Interface

DB7008 is also controlled through a built-in web server. A standard web browser can be used to monitor its status or to make some adjustments. There are two options for access to the WEB interface of DB7008:

- via a standard WEB browser by specifying the device's IP address (the IP address should be manually identified first);
- via the "Network discovery" option.

MANUAL IP ADDRESS IDENTIFICATION

Connect the device to a local network or to the Internet by the applied LAN cable. Through the front panel navigational menu pressing the [OK] button will enable you to enter the device main menu.

Using the [RIGHT] navigational button find the ***Status*** section located at the end of the menu. Press the [OK] button to enter the ***Status*** section. Via the front panel navigational menu press the [DOWN] button.

This operation will visualize the screen containing information about the IP address of the device. Open a new WEB Browser and enter the device IP address in the address field then press [Enter].

NOTE: Due to the inability of some WEB browsers to read the IP address format displayed on the screen of the device, the numbers included in the IP address must be written without the leading zeros. For example: `192.168.020.095` must be written as `192.168.20.95`

A window that requires username and password will appear. Default values being Username: `user` or `admin`, Password:`pass`

NETWORK DISCOVERY

This is a network setting that defines whether your computer can see (find) other computers and devices on the network and whether other computers on the network can see your computer. By default, Windows Firewall blocks network discovery but you can enable it.

1. Open Advanced sharing settings by clicking the Start button, and then on "Control Panel". In the search box, type "network", click "Network and Sharing Center", and then, in the left pane click "Change advanced sharing settings";
2. Select your current network profile;
3. Click Turn on network discovery, and then click save changes.

NOTE: If you're prompted for an administrator password or confirmation, type the password, provide confirmation or contact your system administrator.

If you have already enabled this function on your computer DB7008 will be automatically added to the Device list section. The device will be ready for usage and no additional adjustments will be required except **user name** and **password**.

ACCESS

DB7008 provides you with a protected access to the device settings. You can choose between two types of log in:

1. As an ADMINISTRATOR – it will give you full control over the settings (username: `admin`, password: `pass`);
2. As a USER – this type of log-in will allow you to monitor the device and to choose different stations without applying settings (username: `user`, password: `pass`).

In order to make the necessary adjustments to the device, please log in as an ADMINISTRATOR.

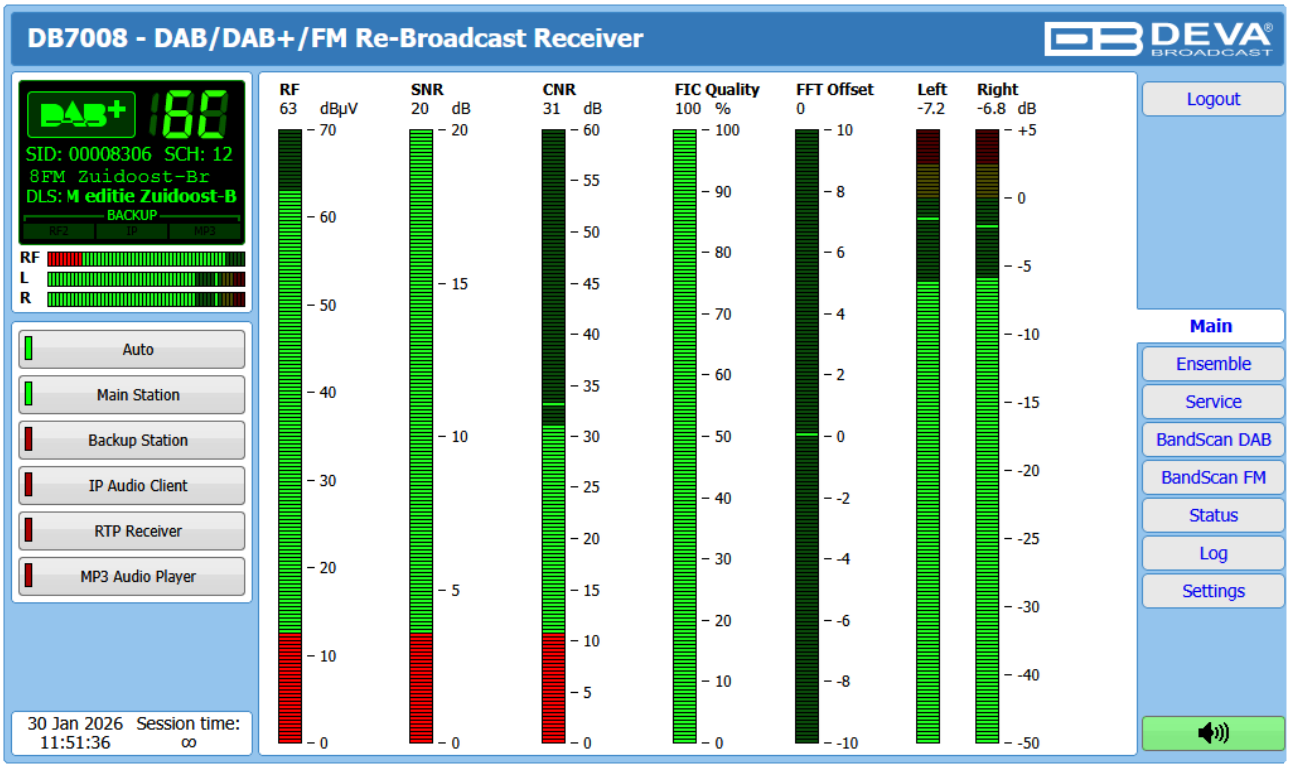
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WEB Interface menu pages

MAIN SCREEN

The Main screen is divided into Left and Right sections.

- On the Right are all the specific contextual readings of the currently selected menu page.
- On the Left is the so called “dashboard” of the device - General Tuner and Channel readings, functional buttons. This section of the WEB interface is constant part of each screen, hence allowing immediate tuner interactions.
-

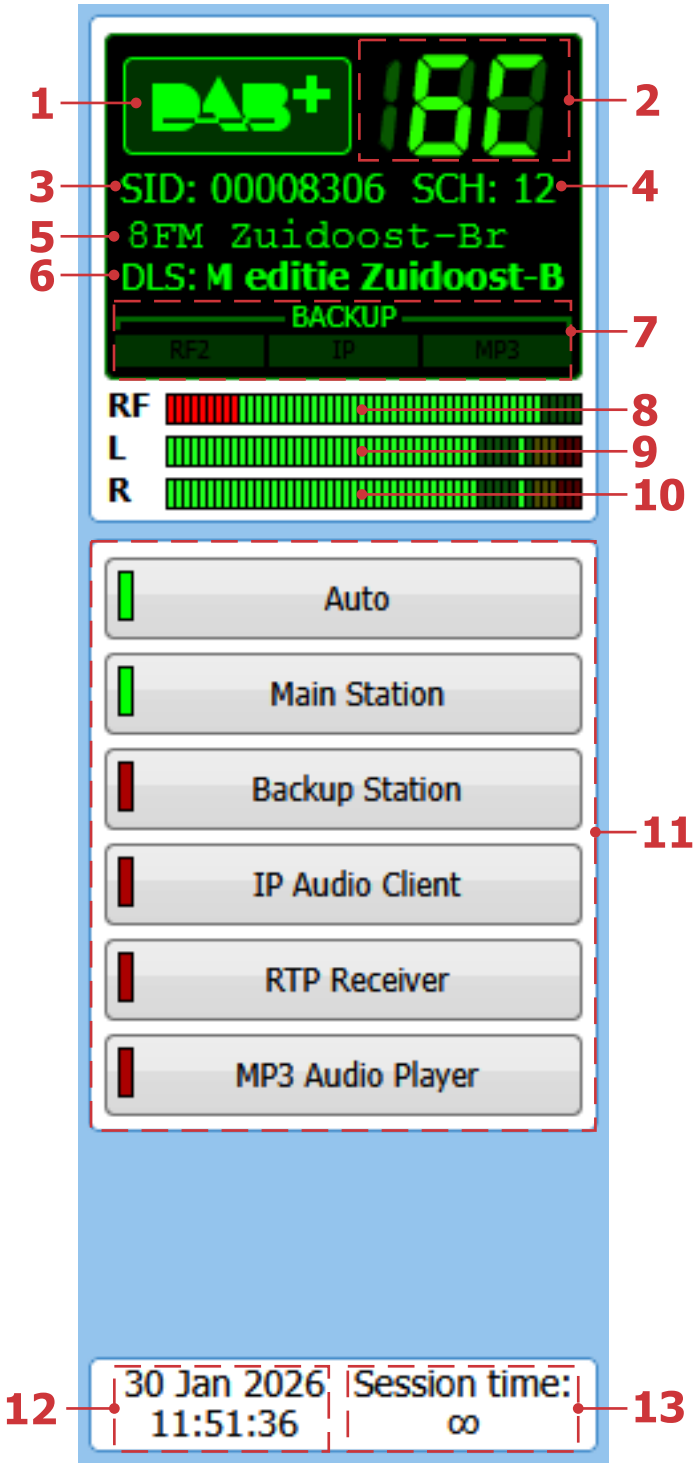


The main screen contains information on the mandatory parameters for the currently selected DAB/DAB+ station, represented as LED readings.

You can easily select the preferred audio frequency by using the selection buttons, placed on the left part of the screen. All station presets are user defined.

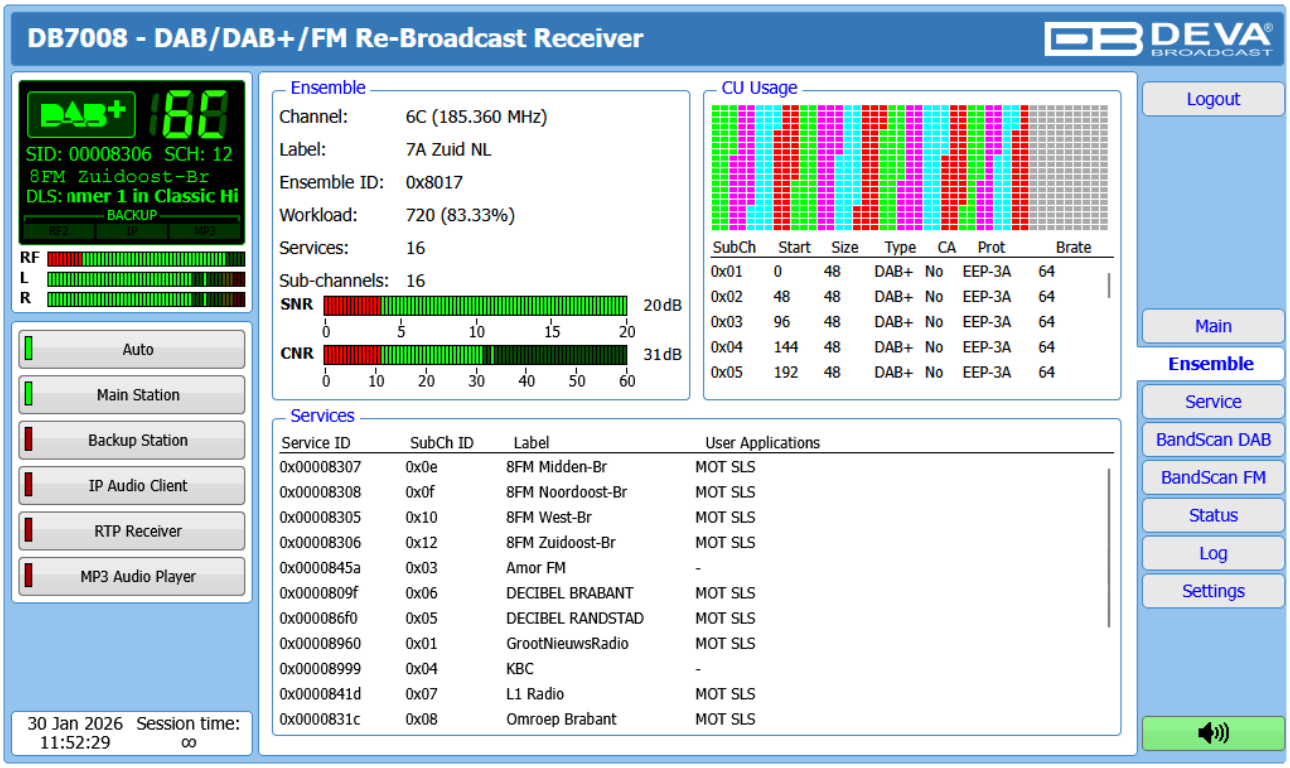
[Listen] button – used to Play/Stop the current audio stream (audio device will be required).

DB7008 “dashboard” content:



1. DAB/DAB+ signal lock indicator;
2. Frequency indicator showing currently tuned frequency;
3. SID – This 16-bit field shall specify the DAB Service Identifier (SID) to which the information block data applies;
4. SCH – Sub Channel ID;
5. Currently selected service label;
6. DLS – (Dynamic Label Segment) scrolling text;
7. Alarm presence indicator – will be lit in red when an alarm on at least one channel is detected;
8. RF Level indicator. The red zone (low level) indicates low RF level;
9. Left Audio indicator;
10. Right Audio indicator;
11. Interactive Buttons, used for quick selection of currently working audio source;
12. Device Time and Date;
13. Session time;

ENSEMBLE



Ensemble

This section provides information about the currently selected ensemble - Channel, Label, Ensemble ID, Workload, number of available Services and Sub-channels. SNR (signal-to-noise) and CNR (carrier-to-noise) indicators in dB, represented as LED readings, are also available.

CU Usage

Visual representation of the CU usage of the Ensemble is available in this section of the WEB Interface. An ensemble has a maximum bit rate that can be carried. It depends on the used error protection level. Usually, all DAB multiplexes can carry a total of 864 “capacity units”. Having said that the number of capacity units (or CU) that a certain bit-rate level requires, depends on the amount of error correction added to the transmission.

Services

An Ensemble will typically carry multiple services from multiple radio networks. List of the available Services can also be found in this tab.

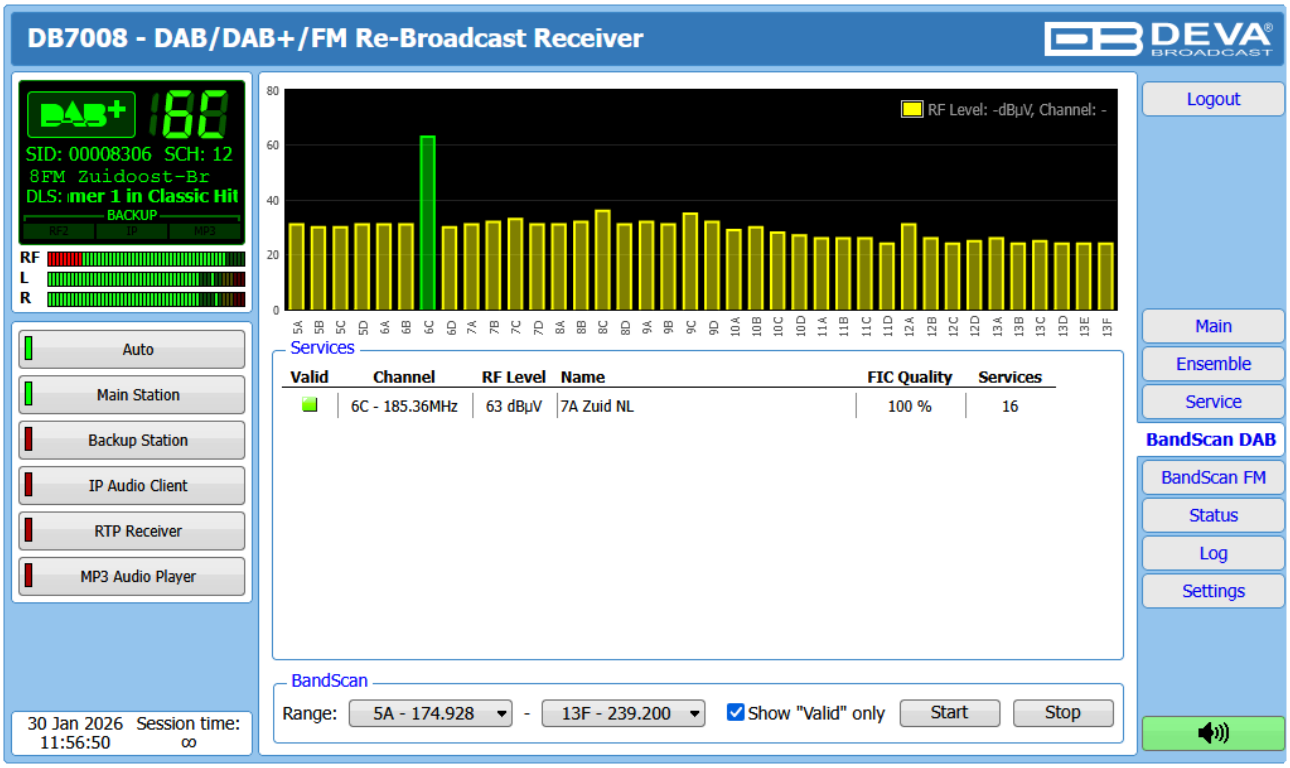
SERVICE



This Screen contains information on all the mandatory parameters of the currently selected service. Slideshow is also displayed (if available).

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BANDSCAN DAB



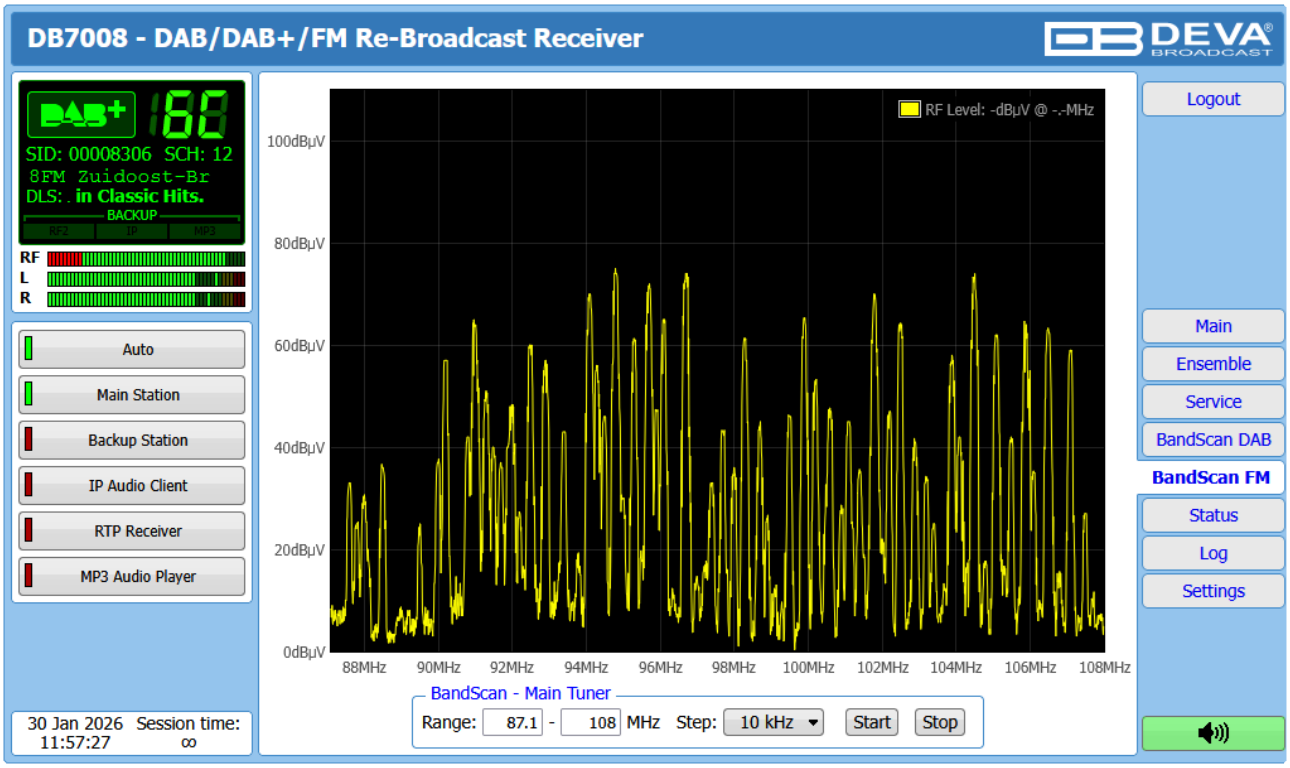
The bandscanning mode is easily customized by setting range of the scan. To start a bandscan follow the instructions listed below:

1. Set the bandscan range;
2. Specified whether all results or the Valid only will be shown;
3. Press the [Start] button;
4. The scan can be stopped at any point by pressing the [Stop] button.

If the **Show "Valid" only** option is enabled, only the valid results will be listed. If not, all the results will be visible and the valid ones will be illuminated in green.

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BANDSCAN FM



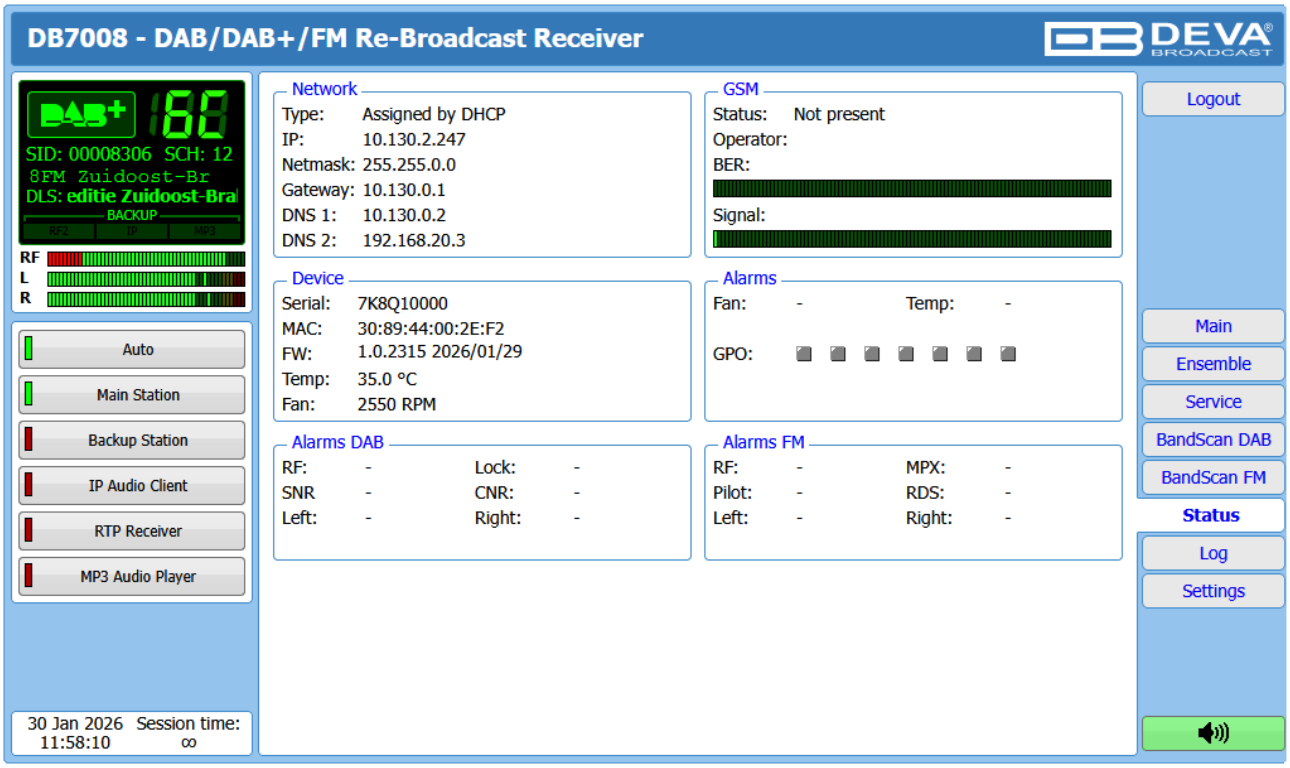
This Screen evaluates FM broadcast band congestion by sweeping the tuner across the FM band, logging every carrier and generating a spectrum display of carrier level vs. frequency.

The Bandscan application utilizes four different types of Bandscan, depending on the preferred signal frequency step. The bandscanning mode could be customized by setting low and high frequency limits of the scan. Once you have set the frequency step and low/high frequencies, the

[Start] button should be pressed in order for the Bandscan process to be initiated. The current scan could be stopped at any time by pressing the [Stop] button.

To evaluate the RF level of the specified frequency, move the vertical marker along the horizontal scale. The Values at the cross-point will be shown at the top right corner of the graph.

STATUS

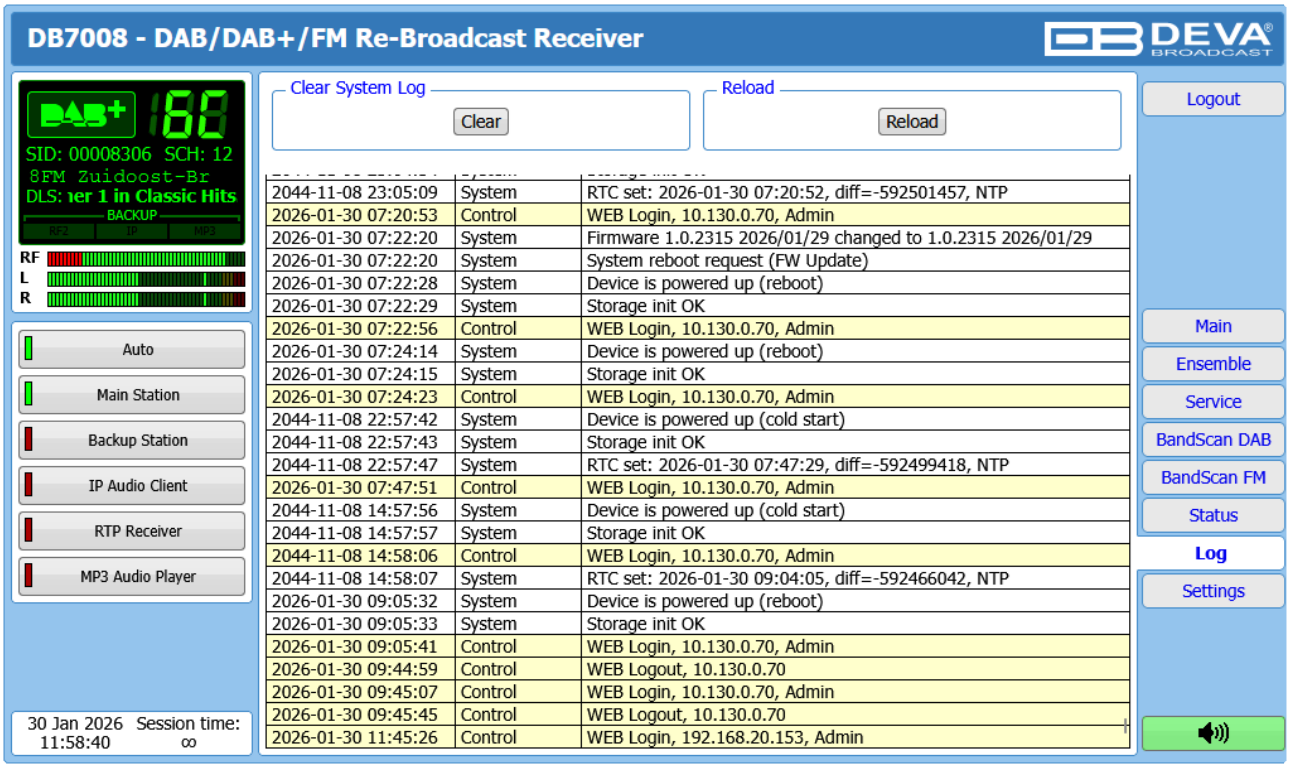


This Screen shows information on the basic device and network status – serial number, IP address, MAC, etc.

The DAB and FM Alarms parameters have several conditions:

- In range – green OK;
- Out of range – red LOW, HIGH or LOSS;
- Signal monitoring is not enabled – n/a.

LOG



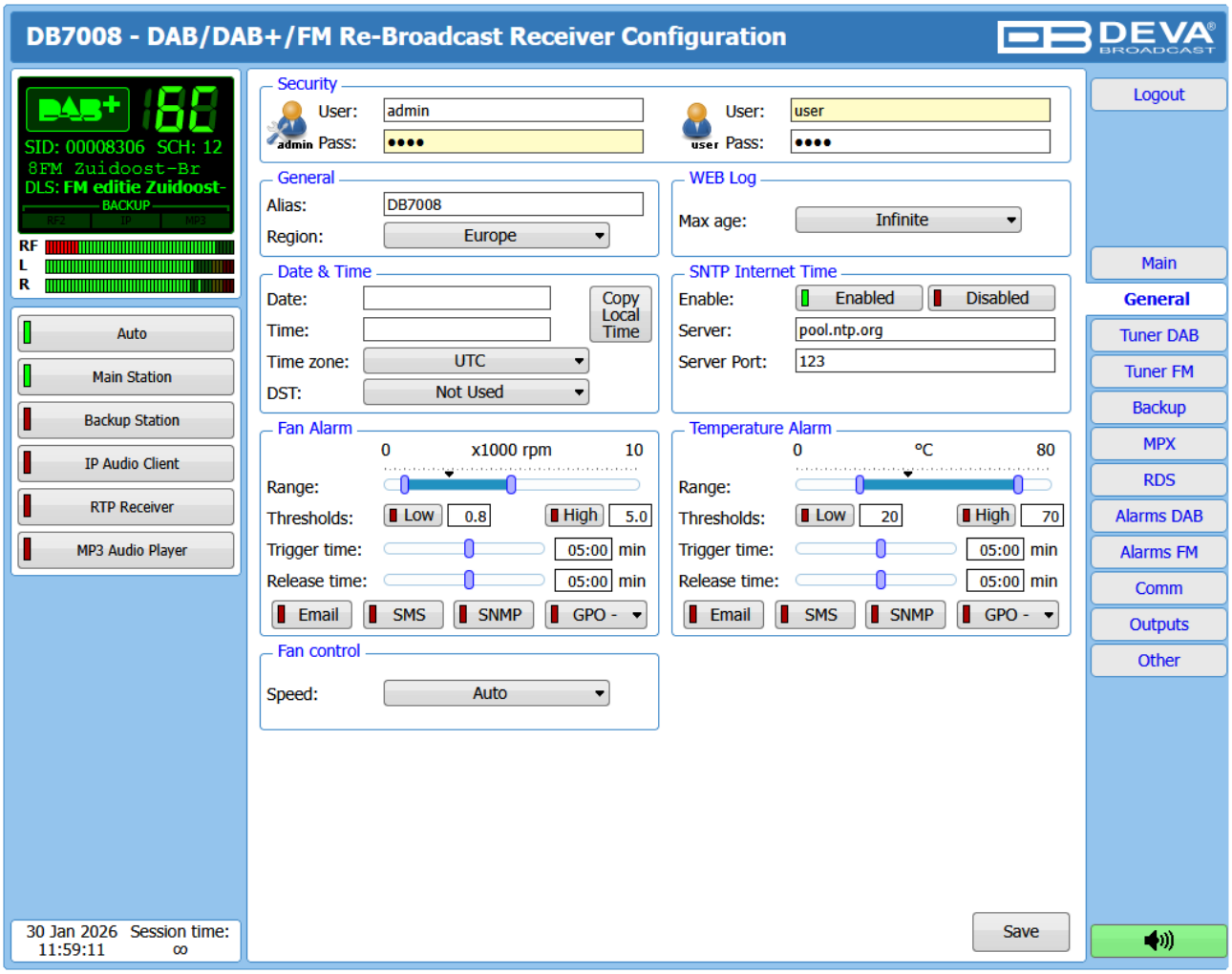
Here are listed all the Device System Events. The local measurements and logs are saved in the internal device memory. All log files can be downloaded via the built-in FTP server. For information on how the connection betweetn the DB7008 and an FTP Client should be configured, please refer to “Download files via FTP” on page 64.

[Clear] will delete the System log.

[Reload] will refresh the information.

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GENERAL SETTINGS



DB7008 provides you with protected access to the device settings. You can choose between two types of log in.

- As an ADMINISTRATOR – It will give you full control over the settings of the device;
- As a USER – that will allow you to just monitor the device and to choose different stations, while the Settings bar remains locked.

In order for the security of DB7008 to be enhanced, a new username and password can be set from the Security section. By choice, you can change the name of the device (General section). Later on, it will be used as a title name for all WEB pages. Customizing the name will make the device more recognizable.

The frequency range can be changed via the ***General > Region*** settings. You can choose from several regions, depending on your location.

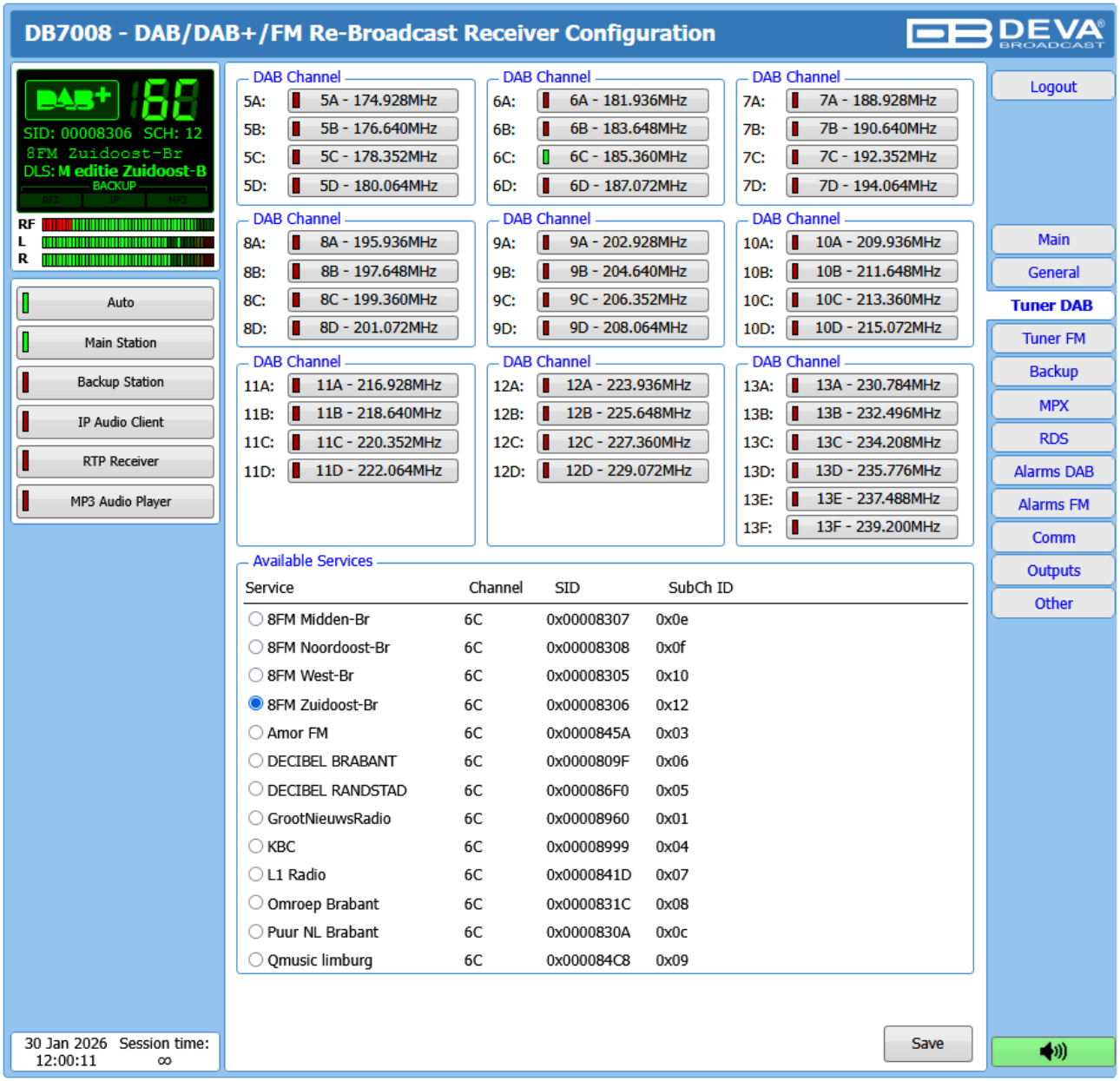
WEB Log – the maximum storage time of the System Log file is chosen from here. If the file is older than the specified maximum will be deleted.

Date & Time – used for manually set the current Date and Time. [Copy Local Time] button will set the Date and Time to correspond to that of your computer.

SNTP Internet Time – Synchronizes automatically the DB7008 clock to a millisecond with the Internet time server. Enable this function in order to use it. (Specifying the server closest to your location will improve the accuracy).

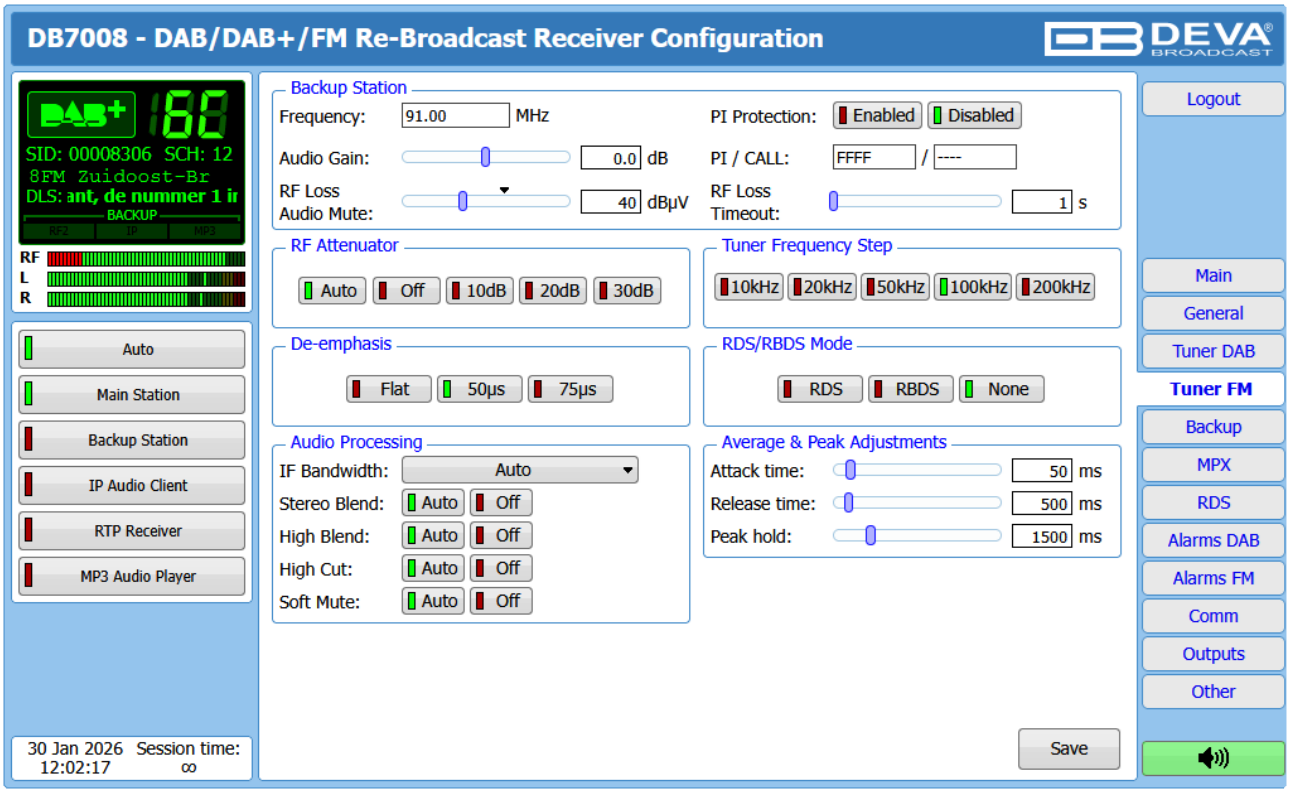
NOTE: In order for the applied settings to be used press the [Save] button, placed on the bottom right part of the screen.

TUNER DAB SETTINGS



The Tuner Section gives control over Tuner settings, allowing you to select a DAB channel and service. All available services will be listed below once the list is collected from the multiplex data.

TUNER FM SETTINGS



The Tuner Section gives full control over Tuner settings.

Tuner Frequency Step – Allows tuner frequency step value to be set.

RDS/RBDS Mode – Depending on the client's preferences, the deviation could be measured in % [RBDS] or in kHz [RDS].

De-emphasis – User defined De-emphasis could be set, where the default values are 50 kHz Frequency Step and 50µs De-emphasis.

Audio Processing – If the IF Bandwidth is set to Auto, these settings depend on the quality of the received signal (RF Level, Multipath, and etc.). If any changes in the signal are detected, the unit will automatically adjust to the correct values.

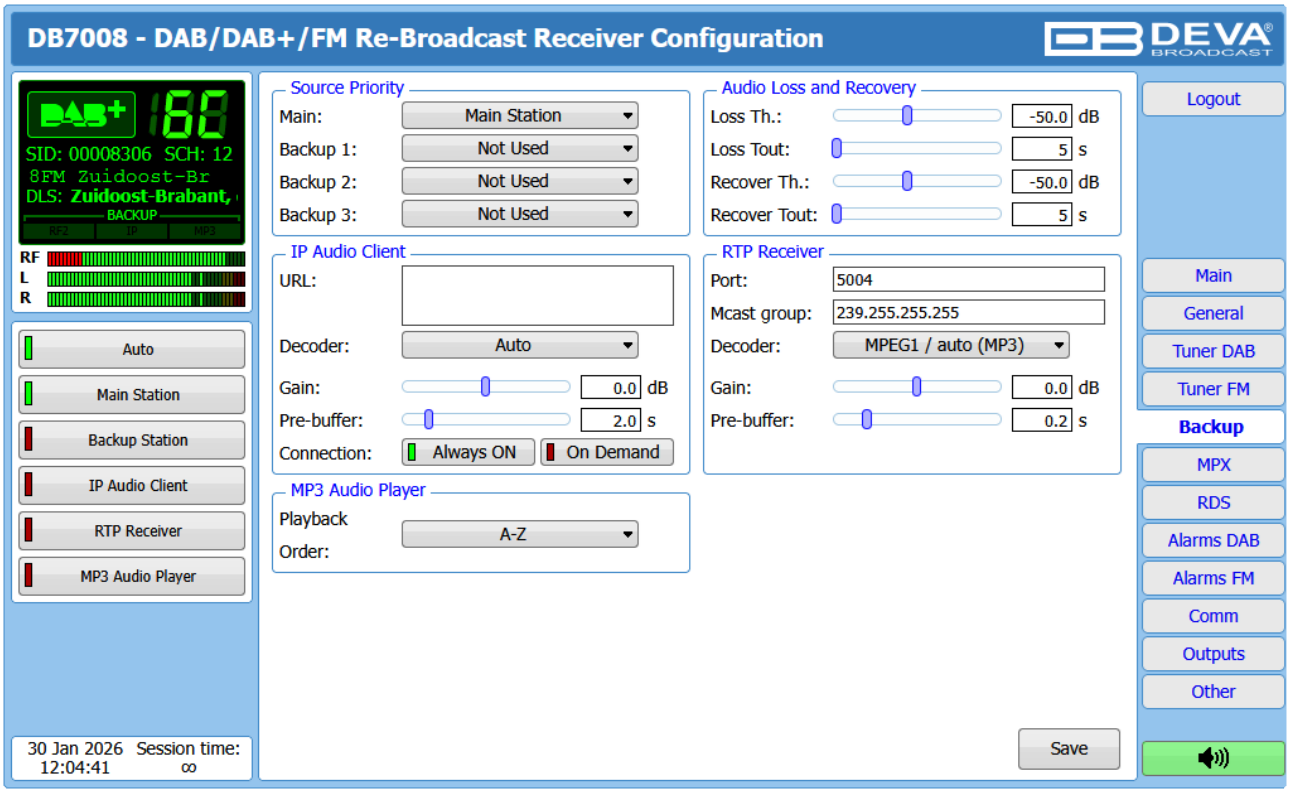
- **Stereo Blend** – reduces the stereo separation if the received signal is bad;
- **High Blend** – applies low pass filter to the L-R audio levels;
- **High Cut** – applies low pass filter to the L+R audio levels;
- **Soft Mute** – reduces the level of the audio if the RF level is too low.

Average & Peak Adjustments Section is used for setting of the indicators response times.

- **Attack time** and **Release time** set the rate in which the indicators' level will change in response to the signal. For most of the applications (including this one), the recommended attack time is shorter than the release time.
- **Peak-hold time** – Permits retaining and displaying the peak value reached by the signal for a period of time predefined by the user, in milliseconds.

NOTE: In order for the applied settings to be used press the [Save] button, placed on the bottom right part of the screen.

BACKUP SETTINGS



Through this screen are applied all needed settings to the alternative sources. The backup sources priority is user-defined and can be set through the relevant section. The main source is only one and cannot be changed. If the audio from the main source disappears, the DB7008 will automatically switch to the first backup source; if it also fails, the unit will switch to the second, etc. Once a source with higher priority is restored, the unit will switch back to it.

Audio Loss and Audio Recover – Select the appropriate levels of loss and recovery of the audio signal. Do not forget to set the corresponding timeouts.

IP Audio Client – Specify URL, Decoder, Gain and Pre-buffer time. Several options for decoder are available. The proper one can be chosen from the drop-down menu.

- Connection – Select connection type. On Demand will instruct IP Audio Client to establish a connection only when it is the current audio source, otherwise it will stay disconnected. This mode is useful for metered Internet connections. When set to Always ON the IP Audio Client will keep the connection active even when it is not the current source.

NOTE: On Demand does not apply if IP Audio Client is the Main backup priority. In this case it will work in Always ON mode.

NOTE: If Silence is detected while in On Demand mode, DB7008 will switch to the next backup priority and will disconnect the IP Audio Client connection. It will not return to IP Audio Client again before it switches to Main first.

RTP Receiver – Specify Port, Decoder, Gain, Pre-buffer adjustments and Multicast group IP.

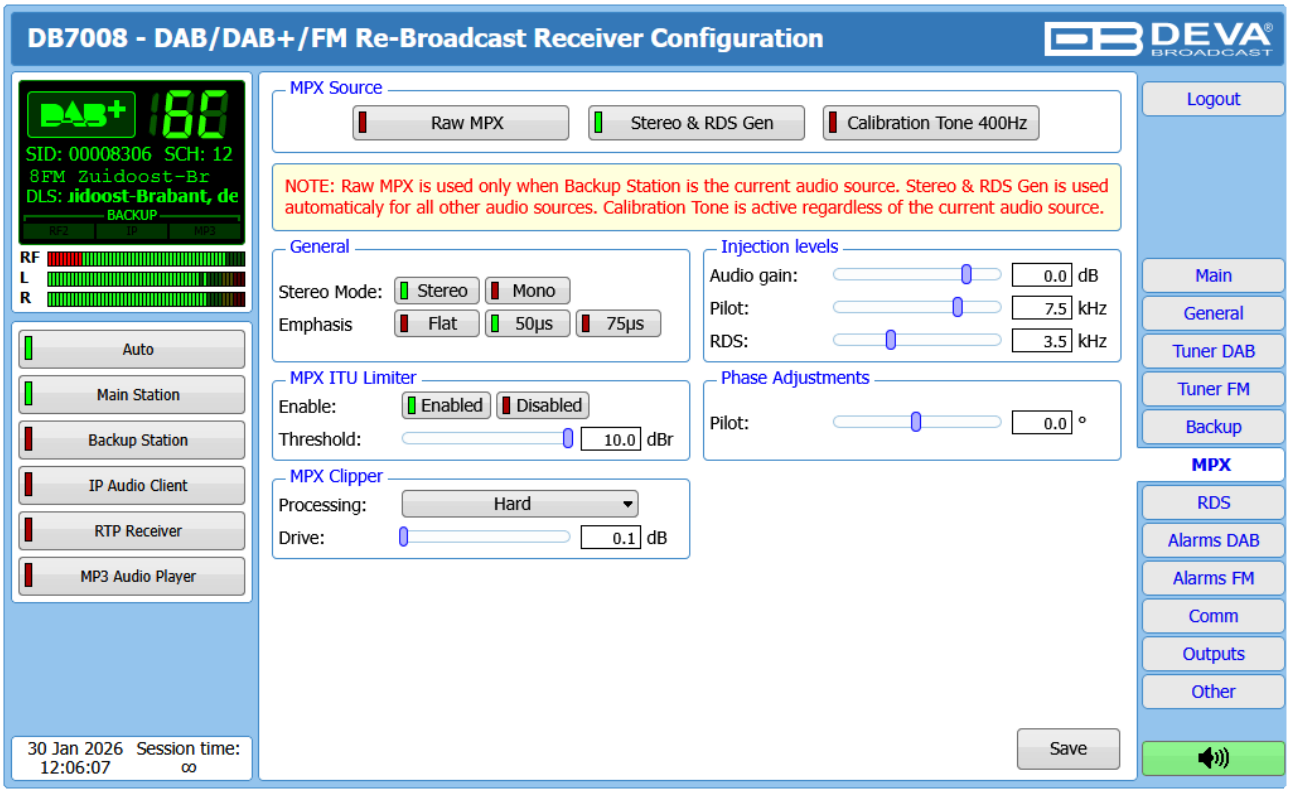
FOR YOUR INFORMATION: A multicast address (Mcast group) is a logical identifier for a group of hosts in a computer network, that are available to process datagrams or frames intended to be multicasted for a designated network service.

MP3 files upload via FTP

DB7008 has a built-in backup audio file player. It plays tracks from SD Card storage which are uploaded over the FTP. All backup audio files must be located in the folder named Audio (that could be found in the root of the SD card). Subfolders are not allowed. The playlist file, if used, must be named playlist.m3u.

For information on how the connection between the DB7008 and an FTP Client should be configured, please refer to “Download files via FTP” on page 64.

MPX SETTINGS



MPX Source – Set the preferred MPX Source. The following options are available:

- [Raw MPX] – demodulated MPX received from the Main Station station;
- [Stereo & RDS Gen] – MPX generated from the built-in Stereo and RDS Generator;
- [Calibration Tone 400Hz] – single tone of 400Hz, used for calibrating of the inputs of the devices connected to the MPX output.

NOTE: Raw MPX is used only when Main Station is the current audio source. **Stereo & RDS Gen** is used automatically for all other audio sources. **Calibration Tone** is active regardless of the current audio source.

General Settings – The settings of the stereo generator are applied through this section. [Stereo] or [Mono] processing and user-defined Emphasis could be set.

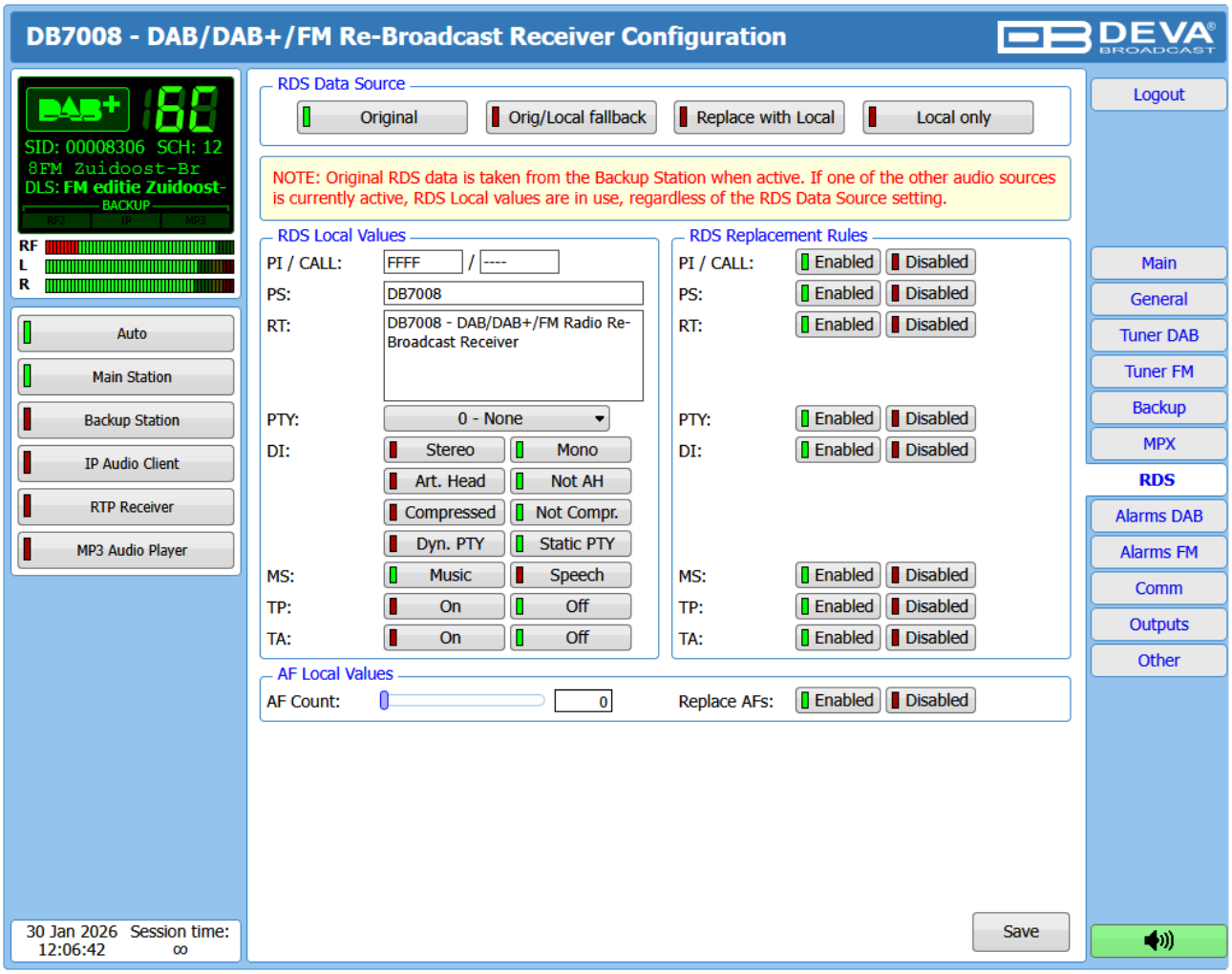
Injection levels – Set the levels of the components included in the obtained final stereo multiplex signal.

Phase Adjustments – The phase of the Pilot is set through this section.

MPX ITU Limiter – The regulatory authorities, in some countries, require the total MPX Power not to exceed 0dBr. Therefore, DB7008 has a built-in MPX ITU limiter that restrains the deviation below the predefined threshold. The default Threshold is 0dBr.

MPX Clipper – intended to minimize MPX overdeviation without the unwanted side effects-uncontrolled noise levels. This process works directly on the audio signal. From here you can enable or disable the clipper. The MPX **Drive** is adjustable from 0dB to 10dB via the interactive slider.

RDS SETTINGS



RDS Data Source:

- [Original] – Original RDS/RBDS data received from the station;
- [Original/Local fallback] – Upon loss of the original RDS/RBDS the local data will be used;
- [Replace with local] – User-defined combination of the original and local RDS/RBDS data;
- [Local only] – User-defined local RDS/RBDS data only.

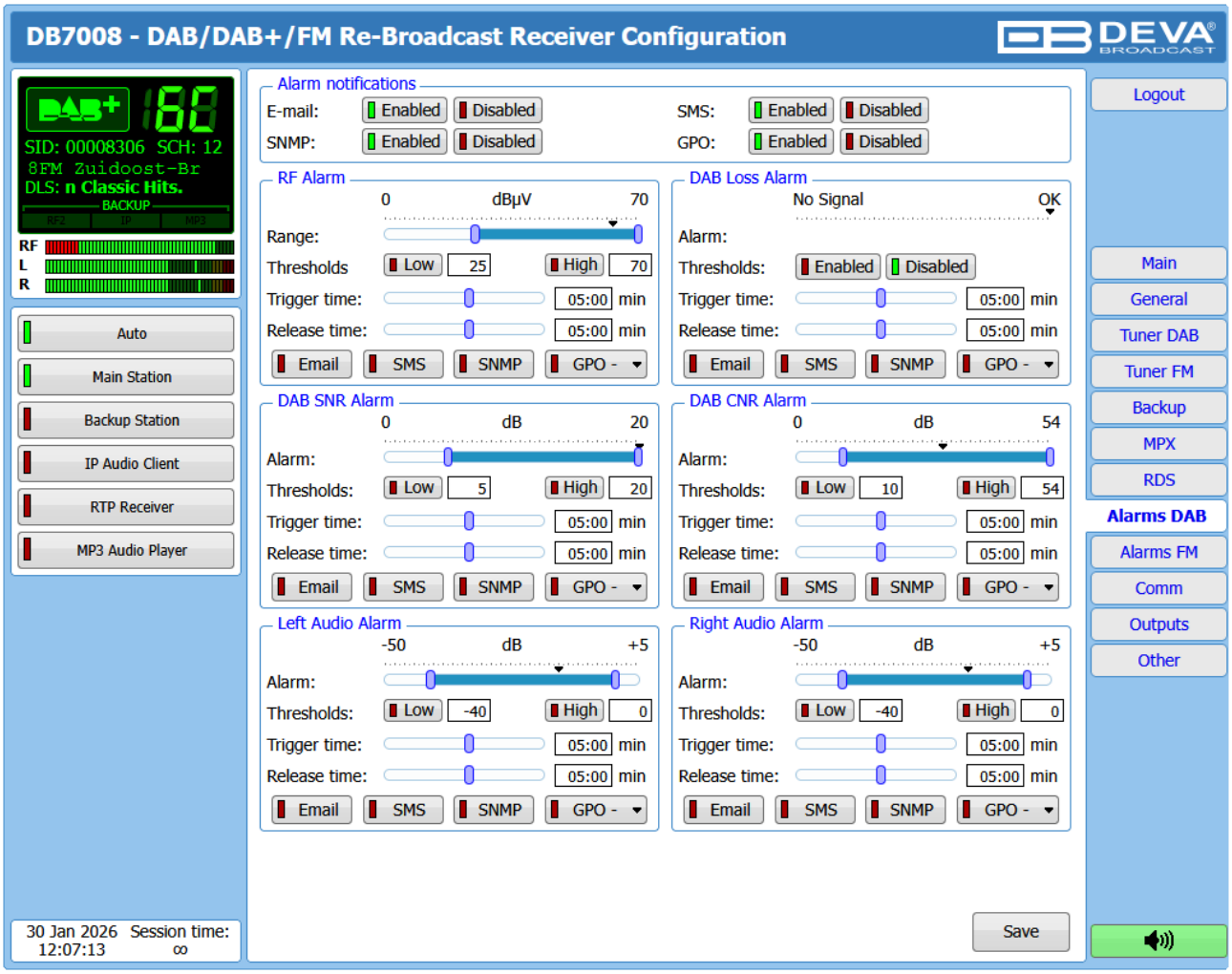
When [Replace with local] RDS data source is chosen, the RDS/RBDS parameters could be replaced with the specified in RDS Local Values section. Whether a parameter would be changed to its local value on the fly, is specified in section RDS Replacement Rules.

NOTE: Original RDS data is taken from the active radio station, either Main or Backup. If one of the other audio sources is currently active, RDS Local values are in use, regardless of the RDS Data Source setting.

RDS Local Values – RDS/RBDS Local Values are defined through this section.

AF Local Values – Set the total needed number of alternative frequencies and their value. The option Replace AFs is also available.

ALARMS DAB SETTINGS



Allows the users to configure threshold values, levels, and notification methods (email/SMS) for the DAB device alerts.

Alarm notifications

- E-mail – global enable/disable E-mail notification;
- SMS – global enable/disable SMS notification;
- SNMP – global enable/disable SNMP notification;
- GPO – global enable/disable GPO actions.

Alarm

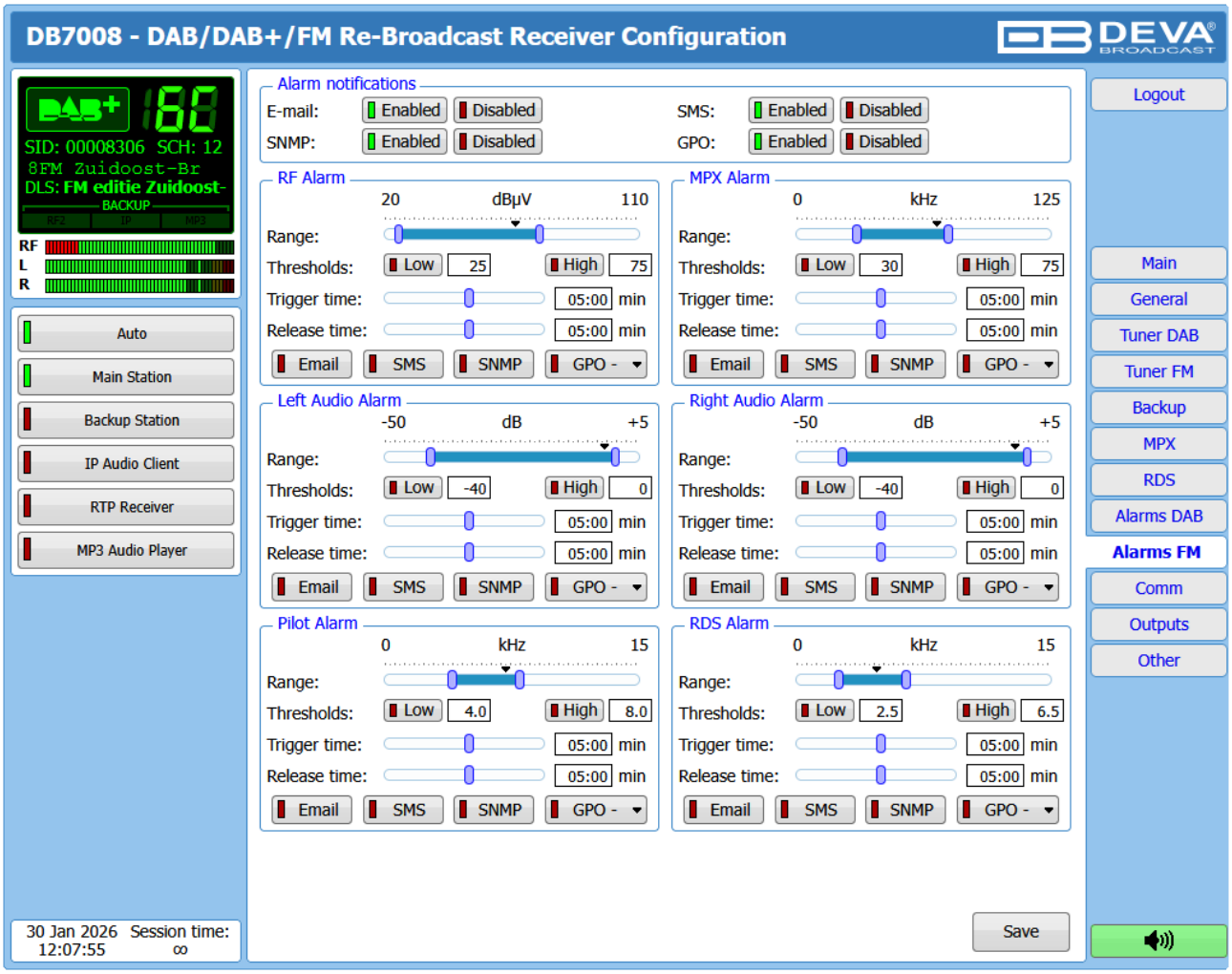
- Alarm Range – used to adjust the Low & High thresholds at which an alarm will be generated;
- Warning Range – used to adjust the Low & High thresholds at which a warning will be generated;
- Threshold – buttons to enable/disable alarm range limits;
- Trigger Time – waiting time before Active Alarm/Warning is generated;
- Release Time – waiting time before Idle Alarm/Warning is generated;
- Alarm notification option.

Trigger and Release times define the time, which should elapse in order for the received signal to be defined as low/high/lost or restored/OK. What we recommend is the release time to be bigger than the trigger time.

NOTE: When setting Trigger and Release times, have in mind that 01:00 means 1 minute, and 00:01 means 1 second.

NOTE: In order for the applied settings to be used press the [Save] button, placed on the bottom right part of the screen.

ALARMS FM SETTINGS



Allows the users to configure threshold values, levels, and notification methods (email/SMS) for the FM device alerts.

Alarm notifications

- E-mail – global enable/disable E-mail notification;
- SMS – global enable/disable SMS notification;
- SNMP – global enable/disable SNMP notification;
- GPO – global enable/disable GPO actions.

The settings applied to each of the available alarms (RF, MPX, Left Audio, Right Audio, Pilot and RDS) are identical and are explained in details below:

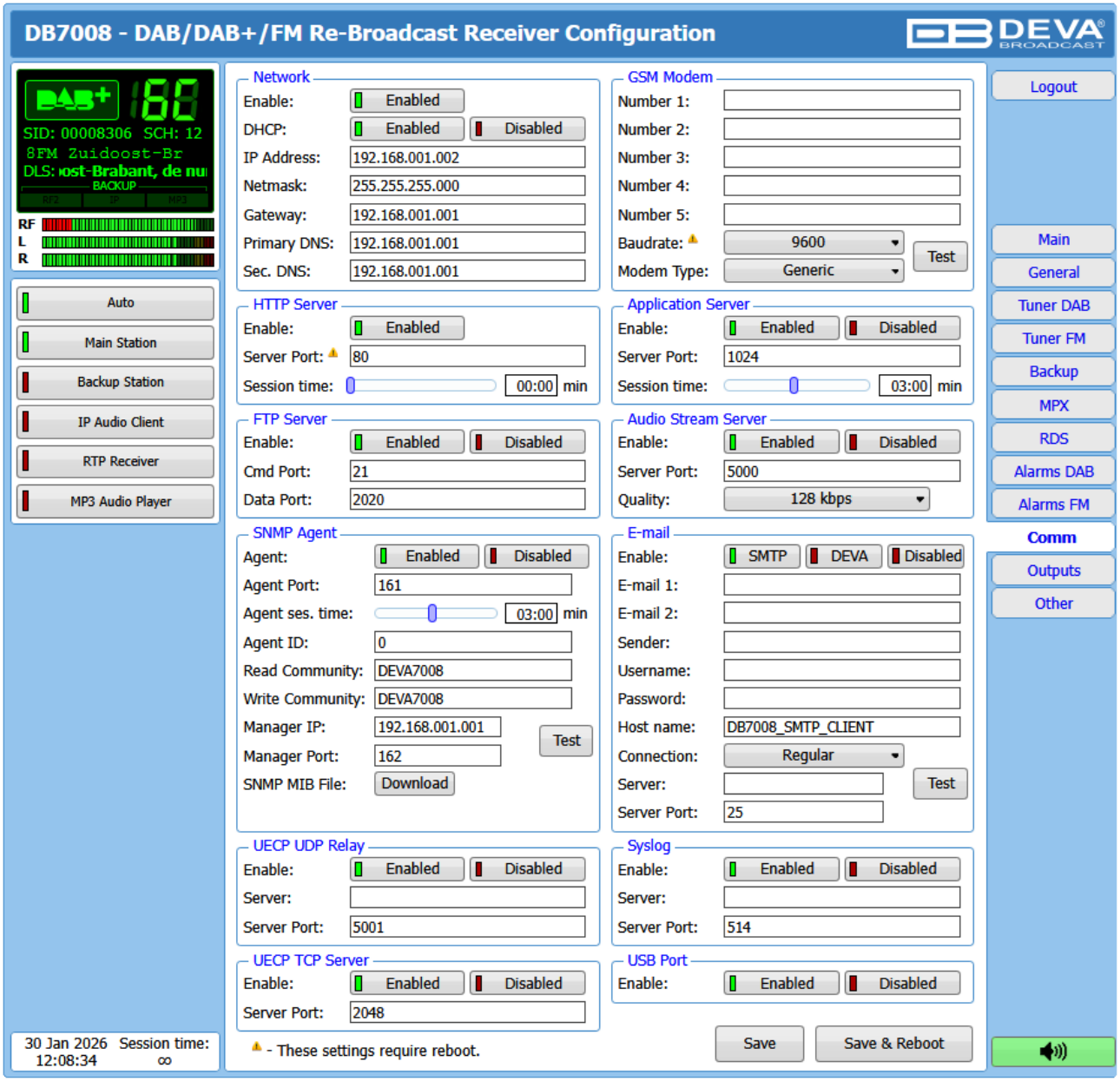
Range – interactive slider used to adjust the Low & High thresholds at which an alarm will be generated;

Trigger Time – waiting time before Active Alarm is generated;

Release Time – waiting time before Idle Alarm is generated;

NOTE: For detailed information on Alarm trigger and notifications refer to “Alarm Triggers” on page 61.

COMMUNICATION SETTINGS



Network

The network addresses could be set manually (static IP) or automatically via a DHCP server. To set static IP, MASK, GATEWAY and DNS addresses, the DHCP should be disabled. In order for the built-in DHCP client to be activated, the function should be enabled. When the DHCP client is activated, all assigned values will be shown in the relevant fields on the Status Screen. If due to any reason, the DHCP procedure cannot be completed, DB7008 will use AutoIP and will generate an IP Address.

HTTP Server

[Enabled] the HTTP Server. Specify the Server Port and session timeout. If the [Enabled] button is not illuminated in green, the option is disabled.

FTP Server

[Enabled]/[Disabled] the FTP Server. Specify the Command and Data Ports to be used.

Audio Stream Server

[Enabled]/[Disabled] the Audio Stream Server. Then specify Port for audio Streaming, and Quality (64, 96, 128, 192 or 256 kbps). The Audio Stream could be heard using suitable audio player (Media Player, Winamp, etc.) or through the WEB interface by pressing the [Listen] button.

SNMP Agent

Agent – [Enabled]/[Disabled] the SNMP Agent.

Specify Agent ID, Agent Port, Read/Write Communities, Manager IP, Manager Port and session timeout. Agent ID is used for identification of the device among others, when an SNMP notification is being sent.

Once all needed settings are applied, use the [Test] button to generate a test notification, which upon success will be received by the SNMP Manager.

Press the [Download] button to download the latest available DB7008 SNMP MIB file.

NOTE: The MIB file may vary from one firmware revision to another. Downloading this file from the device, guarantees that you have the proper MIB file.

E-mail

To use the email notification option, please make sure it is [Enabled] by pressing the relevant button. Then follow the instructions below:

1. Enter the desired alarm recipients in e-mail 1 and/or e-mail 2 fields.
2. Fill in your e-mail account settings: Sender, Username and Password, Server, SNMP port and connection type.
3. It is mandatory the type of connection with the server to be specified from Connection - Regular, Encrypted.
4. The Server port will be changed accordingly. Please note that the most commonly used port will be entered in the field. If the port that is to be used is different, change it manually to the correct value.
5. We recommend you to use the [Test] button and generate a test e-mail, which upon success will be delivered to the specified E-mail 1 and/or E-mail 2. Example of Test E-mail Message:

```
DB7008 Test Message.
Please do not reply to this e-mail.
```

If you experience difficulties in the set-up, or would like to use DEVA account for sending of alarm email notifications, press the [DEVA] button option, and:

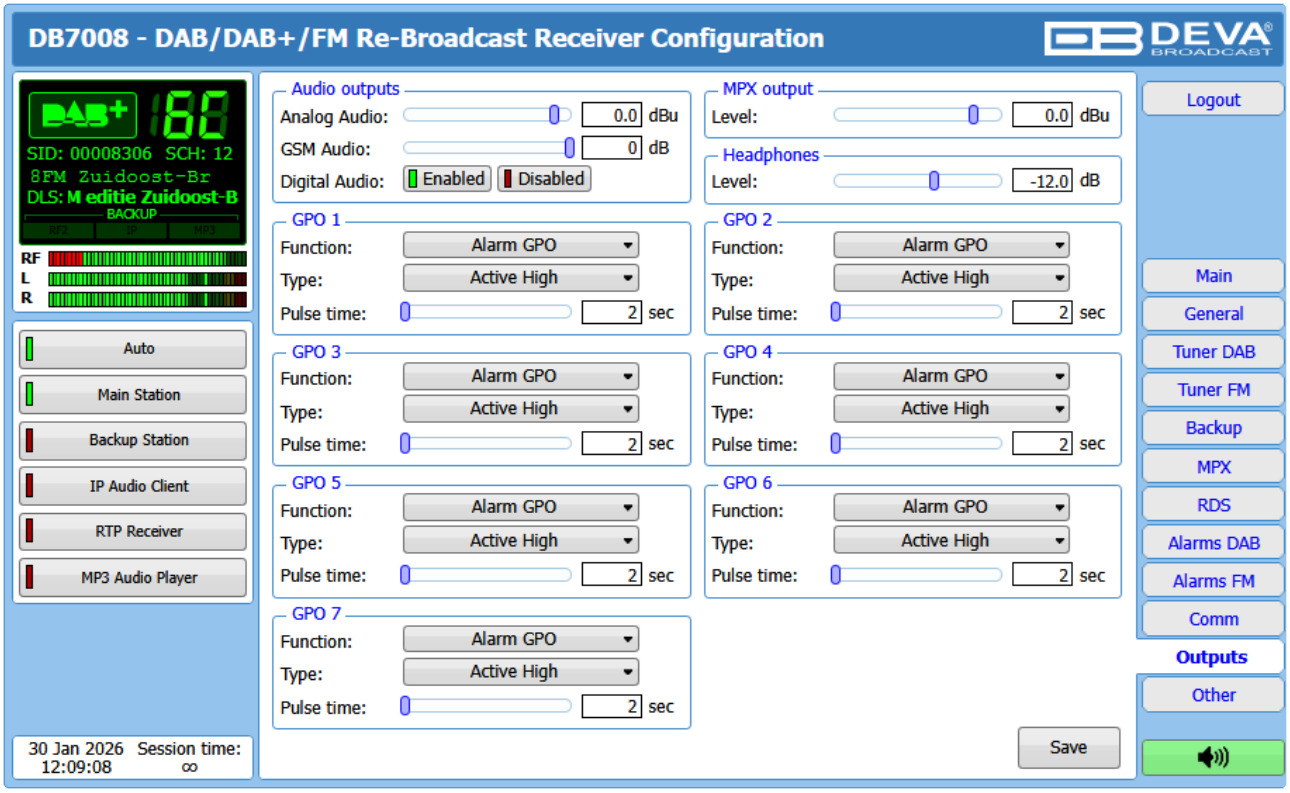
1. Complete the recipient emails (E-mail 1 and E-mail 2) only.
2. The other fields must be left blank, otherwise the email notification option will not be working.
3. We recommend you to use the [Test] button and generate a test e-mail, which upon success will be delivered to the specified E-mail 1 and/or E-mail 2. Example of Test E-mail Message:

```
DB7008 Test Message.
Please do not reply to this e-mail.
```

Even though using the DEVA account eases the set-up process, we recommend user account to be used for sending of email notifications, and the DEVA account for test purposes. When using DEVA account, please note that the stable 24/7 connection depends on the mail service provider and cannot be guaranteed.

NOTE: In order for the applied settings to be used press the [Save] button, placed on the bottom right part of the screen.

OUTPUTS SETTINGS



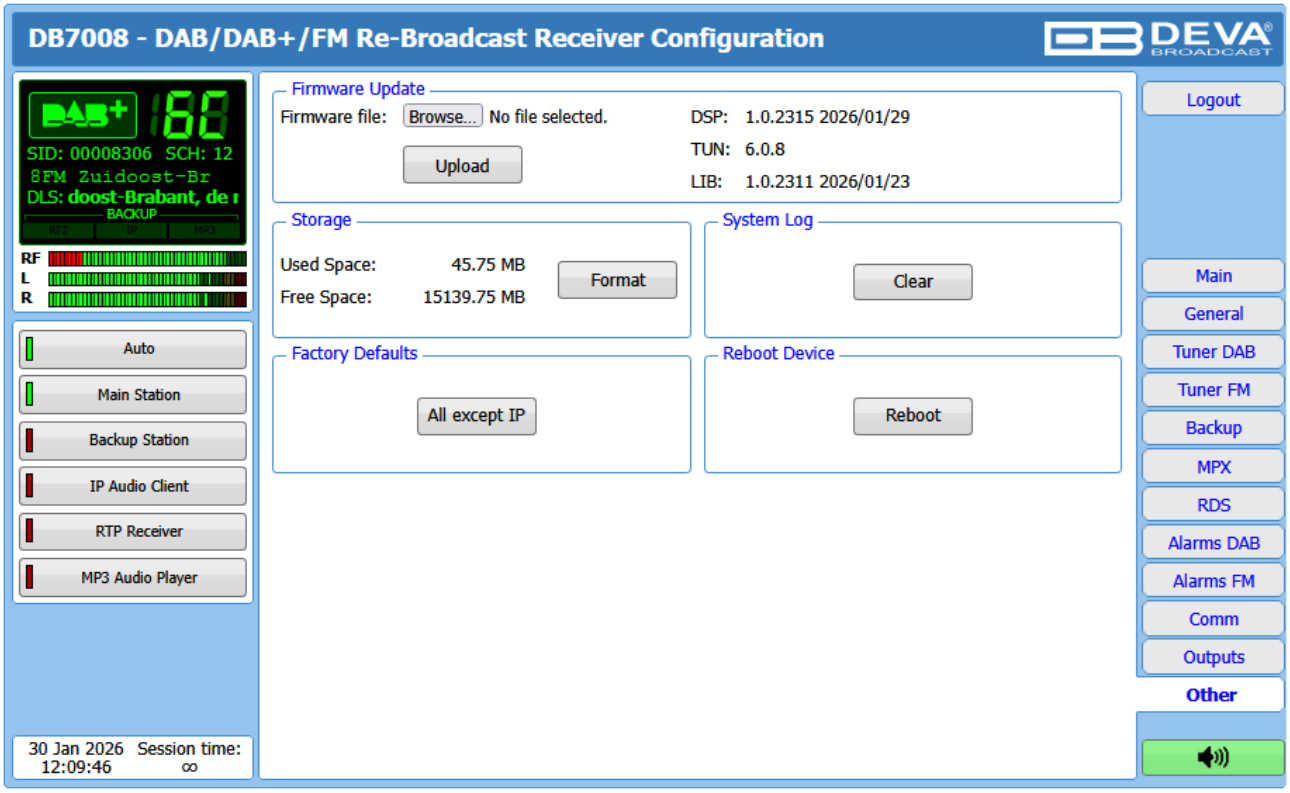
The general purpose outputs settings are applied through this page. Function, type and pulse time for each of the GPOs could be set individually. You can choose between the available functions.

Type is used for specifying of the active level. When an alarm is generated, the output can change the level to Active High/Low or to generate High/Low Pulse.

PLEASE NOTE that if the GPO's function is not assigned as Alarm GPO and is chosen as a preferred alarm, notifications will not be indicated, nevertheless one is being generated.

The Outputs page also allows you to set the Headphones Audio level.

OTHER



Firmware Update

To update the device firmware, select the new firmware file. After having pressed the Upload button, a dialog window will appear. Confirm the firmware update and wait for the process to complete. Information on current DSP1, DSP2 and WEB version is also found in this section.

Storage

Information about the device storage space is found in this section. The entire internal storage could be deleted by pressing the [Format] button.

System Log

By pressing the [Clear] button, all records in the system log will be deleted.

Factory Defaults

[All except IP] – all settings, except for the Network settings (IP Address) will be deleted.

To restore DB7008 to its Factory Defaults, press [All except IP]. A new window will appear – confirm that you want to restore the factory defaults and wait for the process to be completed. On completion of the process, the settings should have the proper default values.

Reboot Device

To start Rebooting of DB7008, press the [Reboot] button. A dialog warning window will appear. Confirm that you want to reboot the device and wait for the process to be completed.

APPENDIX A

RDS: EUROPE VS AMERICA

The European Broadcasting Union (EBU) and its member countries originated the concept of "Radio Data" transmission. The European RDS specification, CENELEC Standard EN50067, was first published in 1984. It was revised in 1986, 1990, 1991 and 1992.

European RDS has grown in use following initial adoption of the Standard. RDS is nearly universal throughout Europe; it is almost impossible to find a European FM broadcasting station that does not carry a radio data subcarrier.

The popularity of RDS in Europe is very much in contrast with initial reluctance on the part of US broadcasters to embrace this technology. This can be ascribed to material differences in broadcasting practices.

Almost without exception, FM broadcasting in the United States is 'detached' and independent - each station originates its own programming. America's National Public Radio might be considered as an exception, though for most of the broadcast day even NPR stations originate, or at least schedule, their own programs.

Most of European broadcasting is similar to the concept of network radio that was common in the US prior to the 1950s. In Europe, a central program originator may have many transmitting facilities of modest power situated throughout the country, at several different frequencies to blanket a designated service area. The European disposition, toward lower-power transmitters can be found on the "local radio" level, as well.

The European concept of a service area equates to the US broadcaster's market. The subtle difference between these designations further characterizes broadcasting practices and ethics. RDS benefits the European broadcaster through almost an altruistic endeavor to be of service to his listeners. The US broadcaster is marketing his programming and is primarily interested in how he can create additional revenue from RDS.

THE RDS SYSTEM

RDS is a digital data channel, transmitted as a low-level subcarrier above the range of the composite stereo program signal in the FM baseband. The data transmission (baud) rate is comparatively low, yet it is quite robust because of data redundancy and effective error correction.

It is not within the scope of this Manual to cover the details of RDS subcarrier coding and modulation. For this, the reader is directed to the Specification appropriate to his location either the CENELEC EN50067 Specification for Europe or the United States NRSC Specification. Since the Manual will deal with specific implication of RDS implemented with the DB7008, it is assumed that the user is familiar with the RDS concept.

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APPENDIX B.1

PTY Code Description Used in RBDS Mode – North America

PTY	Short Name	Description
1	News	News reports, either local or network in origin.
2	Information	Programming that is intended to impart advice.
3	Sports	Sports reporting, commentary, and/or live event coverage, either local or network in origin.
4	Talk	Call-in and/or interview talk shows either local or national in origin.
5	Rock	Album cuts.
6	Classic Rock	Rock oriented oldies, often mixed with hit oldies, from a decade or more ago.
7	Adult Hits	An up-tempo contemporary hits format with no hard rock and no rap.
8	Soft Rock	Album cuts with a generally soft tempo.
9	Top 40	Current hits, often encompassing a variety of rock styles.
10	Country	Country music, including contemporary and traditional styles.
11	Oldies	Popular music, usually rock, with 80% or greater non-current music.
12	Soft	A cross between adult hits and classical, primarily non-current softrock originals.
13	Nostalgia	Big-band music.
14	Jazz	Mostly instrumental, includes both traditional jazz and more modern “smooth jazz.”
15	Classical	Mostly instrumentals, usually orchestral or symphonic music.
16	Rhythm and Blues	A wide range of musical styles, often called “urban contemporary.”
17	Soft R and B	Rhythm and blues with a generally soft tempo.
18	Foreign Language	Any programming format in a language other than English.
19	Religious Music	Music programming with religious lyrics.
20	Religious Talk	Call-in shows, interview programs, etc. with a religious theme.
21	Personality	A radio show where the on-air personality is the main attraction.
22	Public	Programming that is supported by listeners and/or corporate sponsors instead of advertising.
23	College	Programming produced by a college or university radio station.
24	Spanish Talk	Call-in shows, interview programs, etc. in the Spanish language
25	Spanish Music	Music programming in the Spanish language
26	Hip-Hop	Popular music incorporating elements of rap, rhythm-and-blues, funk, and soul
27-28	Unassigned	
29	Weather	Weather forecasts or bulletins that are non-emergency in nature.
30	Emergency Test	Broadcast when testing emergency broadcast equipment or receivers. Not intended for searching or dynamic switching for consumer receivers. Receivers may, if desired, display “TEST” or “Emergency Test”.
31	Emergency	Emergency announcement made under exceptional circumstances to give warning of events causing danger of a general nature. Not to be used for searching - only used in a receiver for dynamic switching.

NOTE: These definitions can differ slightly between various language versions.

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APPENDIX B.2

PTY Code Description Used in RDS Mode – Europe, Asia

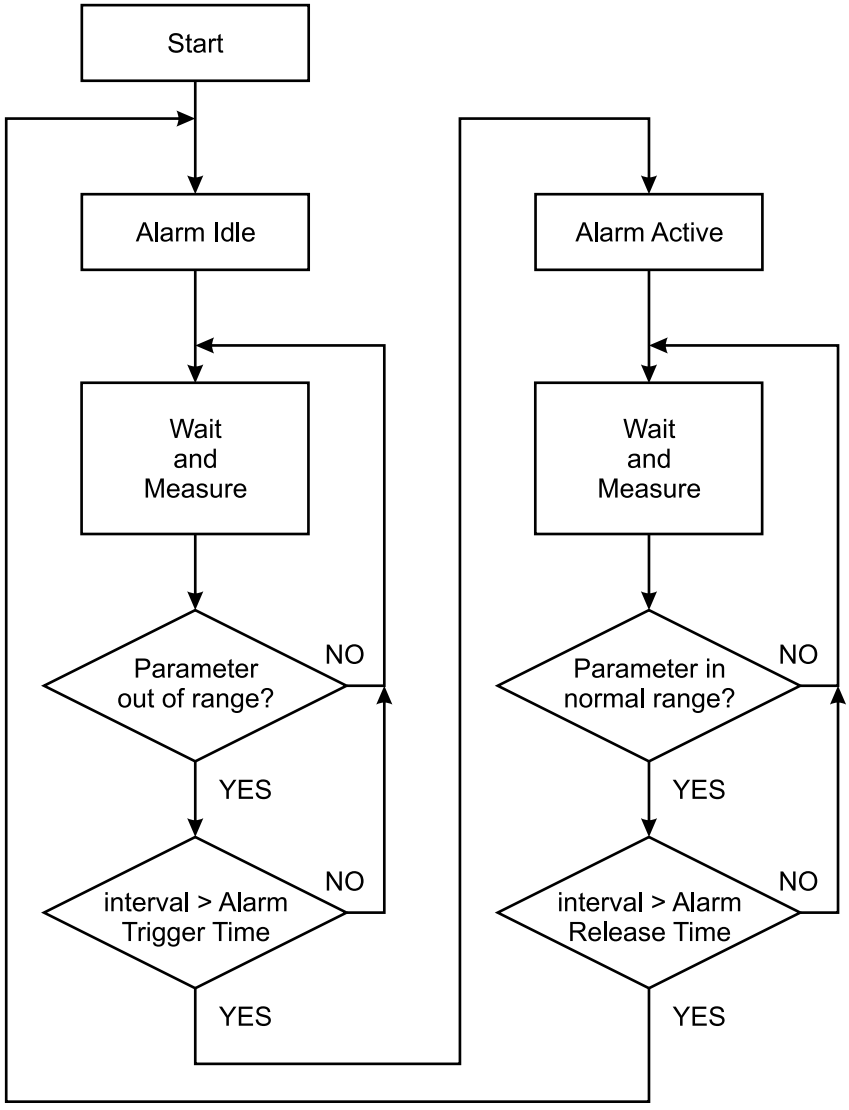
PTY	Short Name	Description
1	News	Short accounts of facts, events and publicly expressed views, reportage and actuality.
2	Current affairs	Topical program expanding or enlarging upon the news, generally in different presentation style or concept, including debate, or analysis.
3	Information	Program the purpose of which is to impart advice in the widest sense.
4	Sport	Program concerned with any aspect of sport.
5	Education	Program intended primarily to educate, of which the formal element is fundamental.
6	Drama	All radio plays and serials.
7	Culture	Programs concerned with any aspect of national or regional culture.
8	Science	Programs about the natural sciences and technology.
9	Varied	Used for mainly speech-based programs usually of light-entertainment nature, not covered by other categories. Examples include: quizzes, games, personality interviews.
10	Pop	Commercial music, which would generally be considered to be of current popular appeal, often featuring in current or recent record sales charts.
11	Rock	Contemporary modern music, usually written and performed by young musicians.
12	Easy Listening	Current contemporary music considered to be “easy-listening”, as opposed to Pop, Rock or Classical, or one of the specialized music styles, Jazz, Folk or Country. Music in this category is often but not always, vocal, and usually of short duration.
13	Light classics	Classical Musical for general, rather than specialist appreciation. Examples of music in this category are instrumental music, and vocal or choral works.
14	Serious classics	Performances of major orchestral works, symphonies, chamber music etc., and including Grand Opera.
15	Other music	Musical styles not fitting into any of the other categories. Particularly used for specialist music of which Rhythm & Blues and Reggae are examples.
16	Weather	Weather reports and forecasts and Meteorological information.
17	Finance	Stock Market reports, commerce, trading etc.
18	Children’s programs	For programs targeted at a young audience, primarily for entertainment and interest, rather than where the objective is to educate.
19	Social Affairs	Programs about people and things that influence them individually or in groups. Includes: sociology, history, geography, psychology and society.
20	Religion	Any aspect of beliefs and faiths, involving a God or Gods, the nature of existence and ethics.
21	Phone In	Involving members of the public expressing their views either by phone or at a public forum.
22	Travel	Features and programs concerned with travel to near and far destinations, package tours and travel ideas and opportunities. Not for use for Announcements about problems, delays, or roadworks affecting immediate travel where TP/TA should be used.
23	Leisure	Programs concerned with recreational activities in which the listener might participate. Examples include, Gardening, Fishing, Antique collecting, Cooking, Food & Wine etc.
24	Jazz Music	Polyphonic, syncopated music characterized by improvisation.
25	Country Music	Songs which originate from, or continue the musical tradition of the American Southern States. Characterized by a straightforward melody and narrative story line.
26	National Music	Current Popular Music of the Nation or Region in that country’s language, as opposed to International ‘Pop’ which is usually US or UK inspired and in English.
27	Oldies Music	Music from the so-called “golden age” of popular music.
28	Folk Music	Music which has its roots in the musical culture of a particular nation, usually played on acoustic instruments. The narrative or story may be based on historical events or people.
29	Documentary	Program concerned with factual matters, presented in an investigative style.
30	Alarm Test	Broadcast when testing emergency broadcast equipment or receivers. Not intended for searching or dynamic switching for consumer receivers.. Receivers may, if desired, display “TEST” or “Alarm Test”.
31	Alarm	Emergency announcement made under exceptional circumstances to give warning of events causing danger of a general nature. Not to be used for searching - only used in a receiver for dynamic switching.

APPENDIX C

ALARM TRIGGERS

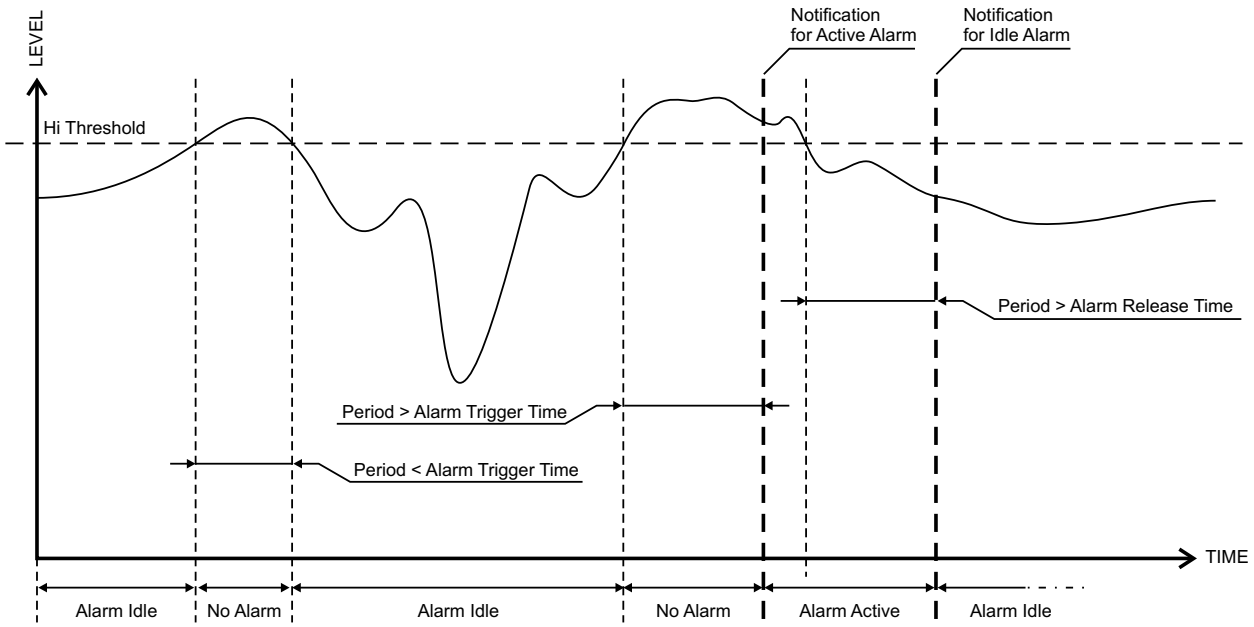
After collecting all the data, the DSP-based core compares the values measured with the predefined by the user threshold levels, for all the alarms monitored. In case that a parameter is beyond limits, the device will initiate the sending of an alarm notification via the selected communication path. All the alarm events are stored in the device's log. It is essential that, if there is a very short fault of the signal, with duration shorter than the alarm Trigger time, the device would not trigger an alarm.

There are several Alarm Triggers for the following parameters: ***RF***, ***MPX***, ***Left/ Right Audio***, ***Pilot*** and ***RDS levels***. An option for defining different limits for each of the parameters is present. All these values, the ***Trigger time*** and the ***Release time*** have to be assigned separately for each of the alarms.



Block Diagram of Alarm Automata

When an observation event takes place, the alarm trigger's state will refresh, if necessary. Should we consider an instance when the alarm trigger is in **Idle** state, having in mind that an alarm is not triggered immediately when a parameter level passes beyond threshold: If the parameter level becomes stable, within thresholds, and the alarm ***Trigger time*** is not elapsed, then the alarm trigger remains in **Idle** state. If the alarm ***Trigger time*** expires and the parameter level is still beyond limits, the ***Alarm trigger*** would change its state to **High/Low**. This would result in predefined actions - alarm notifications (E-mail, SMS, SNMP trap) and save a log record. The state will not be immediately switched into **Idle** when the parameter stabilizes, within threshold levels, not up until the alarm ***Release time*** is elapsed. Meanwhile, if the parameter crosses again any threshold, the ***Alarm trigger*** will remain in active state. If the parameter remain within the threshold levels and the alarm ***Release time*** expires, then the ***Alarm trigger*** would switch into **Idle** state and again predefined actions would be initiated.



ALARM NOTIFICATION

The E-mail, SMS, SNMP trap Alarm Notifications contain the following information - device's Alias, date and time of Alarm triggered, frequency and information about the Alarm activation/ deactivation. The basic signal parameters are also included.

Example for E-mal Notification:

```
Date: 04 Nov 2012, 07:31:11
DB7008 reports ACTIVE alarm on 99.90MHz
Alarm: RDS > 6.5kHz
Signal parameters:
RF: 51.5dBuV
MPX Total: 89.9kHz
Pilot: 7.5kHz
RDS: 11.4kHz
Left: -7.2dB
Right: -8.2dB
```

Example for SMS Notification:

```
ACTIVE ALARM
27.09.2013 09:08:34
FREQ:95.7MHz
RF:35.0dBuV *L*
MPX:60.3kHz
Left:-2.8dB
Right:-3.1dB
Pilot:7.92kHz
RDS:4.12kHz
```

NOTE: **L** means LOW (below threshold), **H** for HIGH (above threshold).

ATTENTION: Because of the SMS length limitations, only the most important parameters are included.

APPENDIX D

HOW SHOULD I CONFIGURE THE CONNECTION BETWEEN MY DEVA DEVICE AND AN FTP CLIENT?

In order for a connection to be established the following setting should be applied:

1. FTP Server Settings

The built-in FTP Server has four important parameters that should be configured: Command Port, Data Port, User name and Password. These parameters are to be used in the FTP client's connection configuration. Further information on how to change the FTP Server's settings and their respective default values can be found in the device's User manual.

WE RECOMMEND the usage of FileZilla (https://filezilla-project.org). This is a widespread open source software distributed free of charge, hence available for downloading from the Internet.

NOTE: The FTP Server can manage only one connection at a time. The FTP Server works in Passive mode. Hence, the FTP Client should also be set in passive mode.

2. IP Router and Port Translation Settings

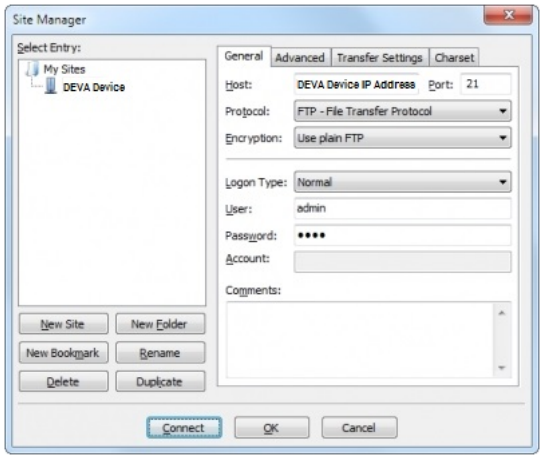
If the connection to the device is made through a Network address translation (NAT) router or firewall, the port forwarding feature of the router should be configured. The port forwarding is usually set in the firewall section of the router's menu. As each router has different port forwarding procedure, we recommend you to refer to its complete manual. To allow proper data flow through the router, the FTP Command and FTP Data ports should be open.

NOTE: The FTP port numbers to be used in the port forwarding feature configuration can be found in the device.

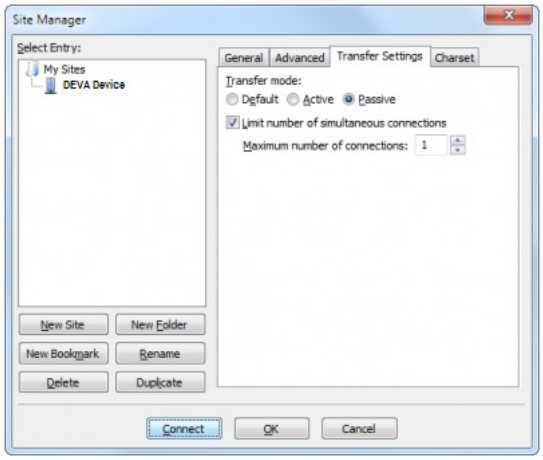
3. Example of FTP Client (FileZilla) Settings

In some cases, FileZilla's "Quick connect" feature is not able to connect with the DEVA unit. That is why we recommend the device to be assigned in the program manually.

Enter the FTP Client and go to: ***File > Site manager > New Site***. A dialog box requiring obligatory information about the device will appear. Fill in the needed information and press "OK".



Select "Transfer Settings" sub-menu and apply the settings as shown below:



APPENDIX E

BATTERY REPLACEMENT PROCEDURE

IMPORTANT: Before starting the procedure, power off and disconnect the device. Perform the battery replacement on a static-resistant work surface and follow all applicable safety precautions.

REPLACEMENT

1. Using a suitable screwdriver, remove the bolts securing the top cover to the chassis.
2. Handle the motherboard with care and avoid applying excessive force.
3. Locate the RTC battery socket on the motherboard.
4. Remove the depleted battery from the socket.
5. Insert a new **3V Lithium CR2032** battery into the battery socket. Ensure that the battery is correctly oriented and securely seated in the socket.

REASSEMBLY

1. Align the top cover with the chassis.
2. Using a suitable screwdriver, tighten the bolts securely. Do not overtighten.
3. Power on the device and verify that the time and date are displayed correctly.

VERIFICATION

If the time and date are retained correctly after the device is powered off and restarted, the RTC battery replacement has been completed successfully.

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WARRANTY TERMS AND CONDITIONS

I. TERMS OF SALE: DEVA Broadcast Ltd. products are sold with an understanding of "full satisfaction"; that is, full credit or refund will be issued for products sold as new if returned to the point of purchase within 30 days following their receipt, provided that they are returned complete and in an "as received" condition.

II. CONDITIONS OF WARRANTY: The following terms apply unless amended in writing by DEVA Broadcast Ltd.

A. The Warranty Registration Card must be completed and returned to DEVA Broadcast Ltd. within 10 days of delivery. Product registration can also be done digitally at https://www.devabroadcast.com/members/product-registration, after registering on our website, within 10 days of delivery.

B. This Warranty applies only to products sold "as new." It is extended only to the original end-user and may not be transferred or assigned without prior written approval by DEVA Broadcast Ltd.

C. This Warranty does not apply to damage caused by improper mains settings and/or power supply.

D. This Warranty does not apply to damage caused by misuse, abuse, accident or neglect. This Warranty is voided by unauthorized attempts at repair or modification, or if the serial identification label has been removed or altered.

III. TERMS OF WARRANTY: DEVA Broadcast Ltd. products are warranted to be free from defects in materials and workmanship.

A. Any discrepancies noted within TWO YEARS of the date of purchase will be repaired free of charge, or the equipment will be replaced with a new or remanufactured product at DEVA Broadcast Ltd. option.

B. Parts and labor for factory repair required after the two-year Warranty period will be billed at prevailing prices and rates.

IV. RETURNING GOODS FOR FACTORY REPAIR:

A. Equipment will not be accepted for Warranty or other repair without a Return Material Authorization (RMA) number issued by DEVA Broadcast Ltd. prior to its return. An RMA number may be obtained by placing an RMA request at https://www.devabroadcast.com/rma. The number should be prominently marked on the outside of the shipping carton.

B. Equipment must be shipped prepaid to DEVA Broadcast Ltd. Damage sustained as a result of improper packing for return to the factory is not covered under terms of the Warranty and may occasion additional charges.

V. UPDATES TO THE TERMS OF SERVICE:

For the most up-to-date, valid, and accurate terms, conditions, and product documentation, please visit the official DEVA Broadcast Ltd. website downloads section at https://www.devabroadcast.com/downloads/deva-documents. Printed documents may not reflect recent amendments. Reviewing the current online versions ensures you have the latest information.

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PRODUCT REGISTRATION CARD

• All fields are required, or warranty registration is invalid and void

Your Company Name_____

Contact_____

Address Line 1_____

Address Line 2_____

City_____

State/Province_____ ZIP/Postal Code_____

Country_____

E-mail_____ Phone_____ Fax_____

Which DEVA Broadcast Ltd. product did you purchase?_____

_____

_____

Product Serial #_____

Purchase date_____/_____/_____ Installation date_____/_____/_____

_____
Your signature*

*Signing this warranty registration form you are stating that all the information provided to DEVA Broadcast Ltd. are truth and correct. DEVA Broadcast Ltd. declines any responsibility for the provided information that could result in an immediate loss of warranty for the above specified product(s).

Privacy statement: DEVA Broadcast Ltd. will not share the personal information you provide on this card with any other parties.