

MAINTENANCE AND OPERATION
INSTRUCTION MANUAL

DB4012

Professional FM/DAB/DAB+
Monitoring Receiver



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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.

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
<u>“Reference Name” on Page XXX</u>	References and links	refer to <u>“New Connection”</u> (see <u>“Monitoring” on page 56</u>)
Example	Used when example text is cited	Example for E-mail Notification: Date: 04 Nov 2013, 07:31:11

General Information

The DB4012 is a next-generation professional broadcast monitoring receiver developed for continuous monitoring and analysis of both FM and DAB/DAB+ radio services. Equipped with two completely independent tuners, one dedicated to FM reception and the other to DAB/DAB+ it performs simultaneous monitoring of both broadcast standards, providing broadcasters with a complete overview of their transmission quality.

Built around a high-performance RF front end and advanced DSP architecture, the DB4012 delivers precise measurement of all critical broadcast parameters. It continuously analyzes RF level, MPX deviation, stereo performance, RDS/RBDS information, loudness, audio levels and signal quality for FM broadcasts, while the DAB/DAB+ receiver provides complete ensemble, service and subchannel monitoring together with BER measurement, PAD decoding and comprehensive metadata analysis.

The integrated Loudness Analyzer complies with ITU BS.1770-4 and EBU R128 recommendations, enabling accurate loudness monitoring and helping broadcasters maintain consistent on-air audio quality. Advanced RDS/RBDS analysis is complemented by detailed DAB/DAB+ service monitoring, including automatic display of Program Associated Data (PAD), ensemble information, service metadata and transmission parameters.

For long-term performance evaluation, the DB4012 incorporates dedicated 24-channel data loggers for both FM and DAB/DAB+, continuously recording measured parameters, alarms and operational events. Historical data is stored locally and can be easily accessed via the integrated FTP server for analysis, reporting and troubleshooting.

A flexible alarm management system allows users to define thresholds for virtually every monitored parameter, including RF level, audio level, MPX deviation, RDS status, BER, PAD availability, loudness and signal loss. Alarm notifications can be delivered via E-mail, SNMP v2c and rear-panel GPO outputs, ensuring immediate awareness of transmission faults and allowing rapid corrective action.

The DB4012 has been designed for effortless local and remote operation. Its front panel features a high-resolution OLED display, bright LED bar-graph meters and an intuitive navigation system with dedicated soft keys for quick access to all monitoring functions. The built-in web interface enables secure remote control and monitoring from any standard web browser without requiring additional software and is fully compatible with Windows, macOS, Linux, Android and iOS devices.

Engineered for reliable 24/7 operation, the DB4012 provides broadcasters, network operators and regulatory organizations with a powerful, accurate and dependable solution for professional FM and DAB/DAB+ monitoring. By combining comprehensive RF analysis, audio measurement, metadata monitoring, intelligent alarm management and extensive remote capabilities into a single platform, it offers an efficient and future-ready solution for today's hybrid radio networks.

Product Features

- FM Band 87.1 - 108 MHz Basic Spectrum Analyzer
- Up to 100 dB μ V direct RF Antenna Input
- Selectable wide range IF filter bandwidth
- Fully DSP-based core
- Built-in 24 channel FM Data logger
- Bright bar graph LED metering of the RF and Audio Levels
- Wide angle, easy to read OLED display
- Very Intuitive Navigational Menu
- Levels measurement with data history
- Selectable De-emphasis
- Built-in Stereo Decoder
- Built-in Loudness Analyzer
- RDS and RBDS decoder with BER meter
- Accurate front-panel metering for local use
- Restore Factory Parameters option
- Easy Installation and Setup
- Real Time Audio Program Streaming
- DAB/DAB+ compliant receiver
- Support for Program Associated Data (PAD)
- Detailed DAB component information
- High-end digital tuner
- Built-in 24 channel DAB/DAB+ Data logger
- Protected access to the device settings
- Headphone output with front panel level control
- SNTP for automatic synchronization of the built-in clock
- Level Adjustable, Balanced Analog Audio Outputs on XLR Connectors
- Professional AES/EBU Digital audio output
- LAN port for full TCP/IP remote control and monitoring
- Adjustable MIN/MAX alarms for RF, Left & Right Audio Levels
- Alarm dispatch via E-mail, SNMP ver.2C and GPO
- Built-in WEB and FTP server
- Easy to use WEB interface
- Apple and Android devices support
- Firmware updates will ensure improved operation

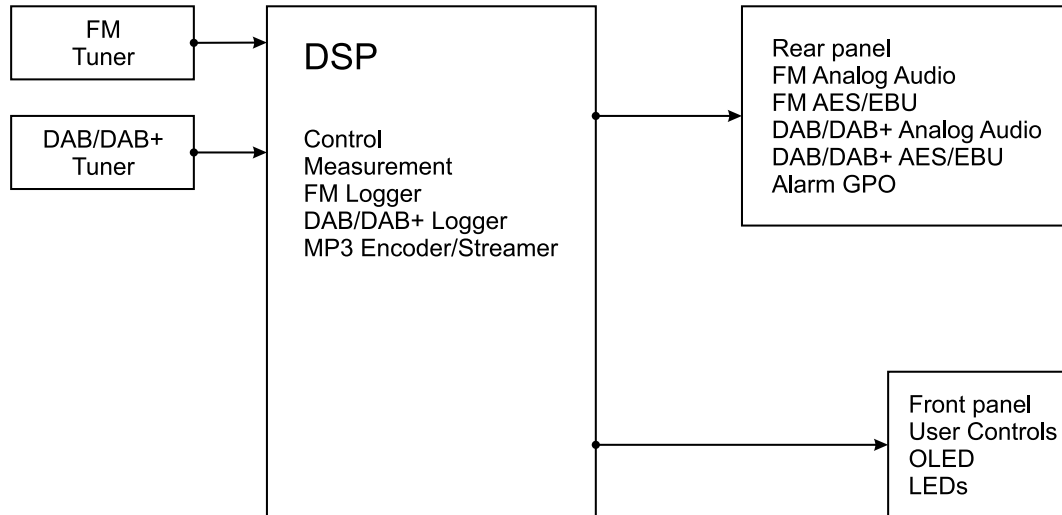
TECHNICAL SPECIFICATIONS

DAB/DAB+ RADIO INPUT	
RF frequency range	168 - 240 MHz
DAB/DAB+	Band III Channels 5A - 13F
Sensitivity	18 dB μ V
Input connector	BNC 50 Ω
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 dB μ V
Antenna Ports	BNC Connector, 50 Ω
Antenna Ports Isolation	> 40 dB
Dynamic range	100 dB
FM DEMOD	
IF Filter Bandwidth	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 μ s de-emphasis
THD	0.15% @ 1kHz, 0.4% from 10Hz to 15kHz, 50 μ s de-emphasis
Separation	50 dB, 50 Hz to 10 kHz, 50 μ s 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 dB μ V
Audio	± 1 dB, +10.0 to -55.0 dB, 0.1 dB resolution
OUTPUTS	
Composite	+12 dBu @ 75kHz, 75 Ω unbalanced BNC Connector
Audio (L, R)	+6 dBu, 600 Ω , balanced XLR Connector
AES3 (L, R)	5.0 Vp-p, 110 Ω , balanced XLR Connector

SPDIF (L, R)	3.0 Vp-p, 110 Ω , 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

BLOCK DIAGRAM

A simplified block diagram of DB4012 is shown below



Because of the all-digital, minimalist-discrete-component nature of device circuitry, we have not provided schematic diagrams of the DB4012 in this Manual. Please, note that:

**NO USER-SERVICEABLE COMPONENTS INSIDE.
REFER ALL SERVICING TO
QUALIFIED TECHNICAL PERSONNEL.**

Safety Warning

ALWAYS OBSERVE THE SAFETY PRECAUTIONS.

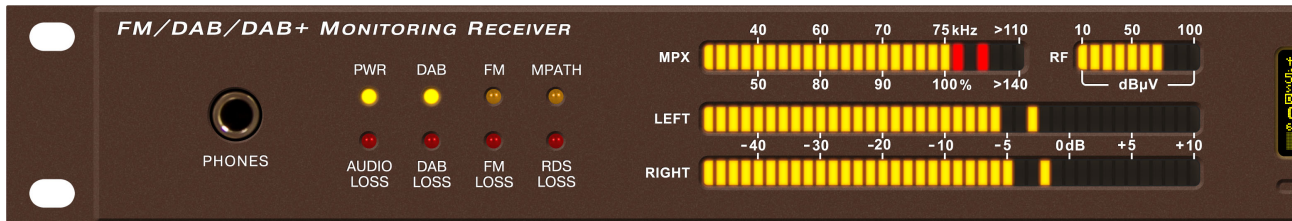
Careful observance of the safety precautions will help prevent physical injury, damage of the equipment, and extend the equipment life.

- 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 100](#).

Panel Indicators, Switches and Connectors



INDICATORS

PWR – indicates that the device is powered up and working.

DAB / FM – indicates DAB/FM information is displayed on Front Panel LED bars and OLED Screen.

MPATH – indicates that the device is receiving a multipath signal.

AUDIO LOSS – indicates that the level of the Left and Right audio channels drops below the selected threshold.

DAB LOSS – indicates that the DAB signal is lost or the received signal level drops below the selected threshold.

FM LOSS – indicates that the FM signal is lost or the received signal level drops below the selected threshold.

RDS LOSS – indicates that the RDS signal is lost or no valid RDS data is being received.

LED METERS

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



OLED DISPLAY

DB4012 has easy to read, high-resolution OLED graphical display that visualizes all measurements of the received signal and DB4012's settings.

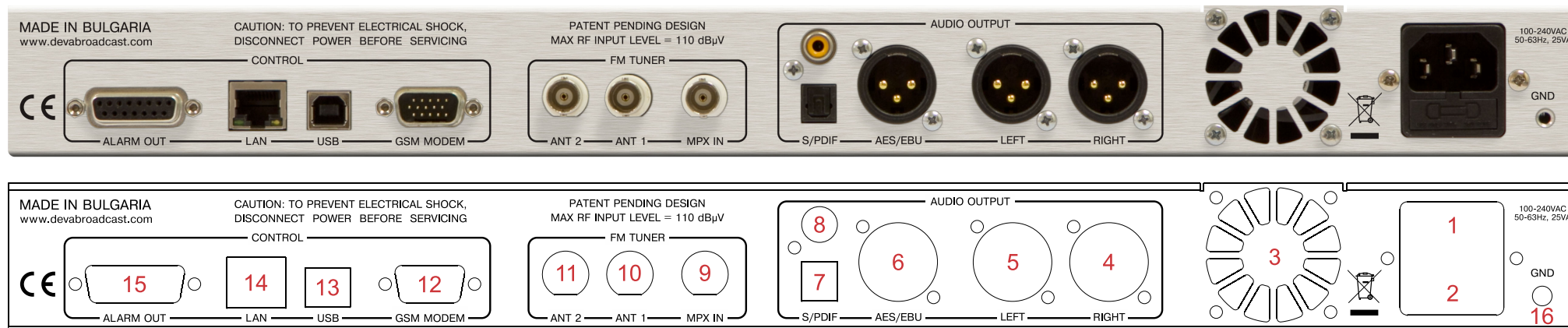
CONTEXT-SENSITIVE SOFT BUTTONS

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

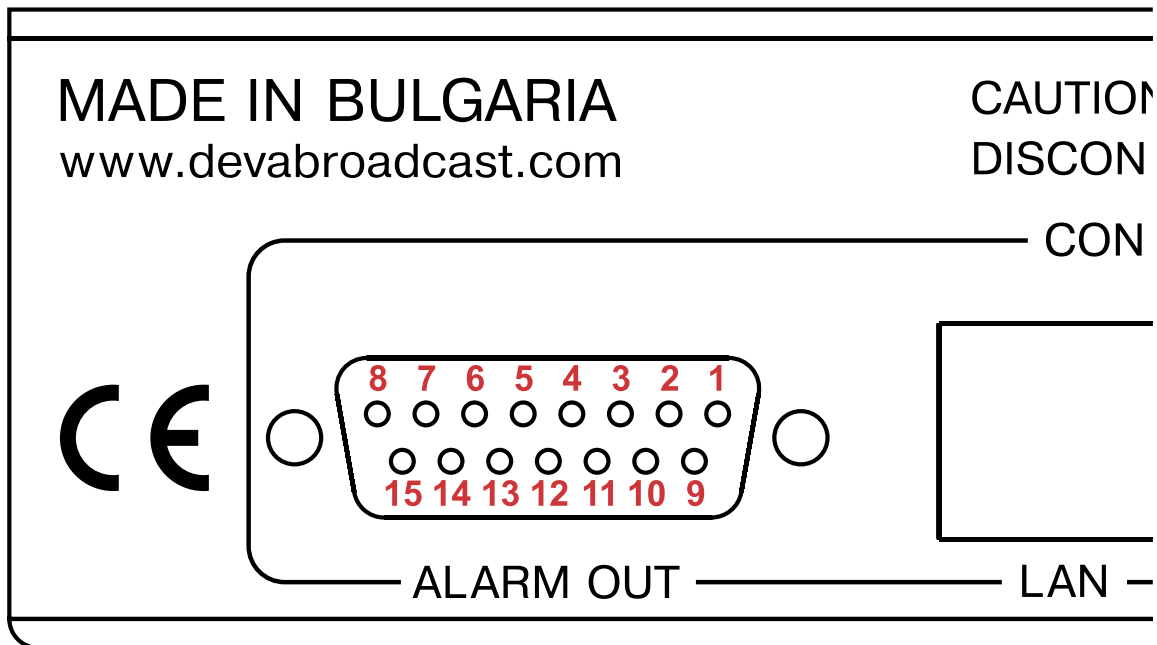
[UP], [DOWN], [LEFT], [RIGHT] and [OK] buttons, are used to navigate through the menus selecting various functions and parameters of DB4012.

REAR PANEL



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

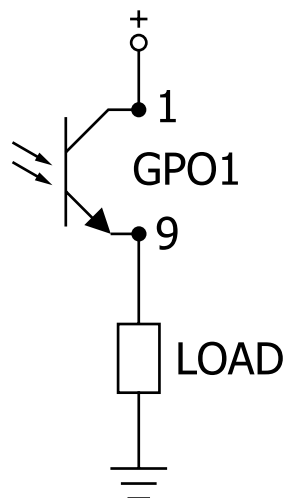
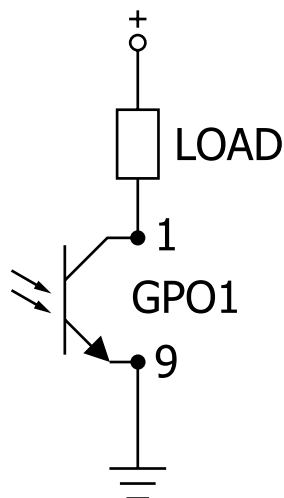
REAR PANEL ALARM TERMINAL



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

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

- 8 - GND



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 pass through all the required data traffic.

RF ENVIRONMENT – PRECAUTIONS, INSTALLATION SPECIFICATIONS AND ANTENNA TYPES

The observation of the RF Environment, in which DB4012 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 DB4012 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 DB4012.

The other type antennas: unidirectional dipole and directional multi-element array antenna are much proper for your needs. We recommend the usage of factory made antenna or antenna system, manufactured specially for the FM Radio Band 88 – 108 MHz.

The recommended working RF signal strength is in the range of 55-90 dB μ V. If the input RF level is above this range, we recommend using external RF attenuators with attenuation value between 20 – 90dB.

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 DB4012 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.

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 DB4012 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 DB4012 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. For detailed explanation of the option, please refer to [“GSM Modem Option” on page 94](#).

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 DB4012 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 DB4012 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.

Front Panel OLED Display, Navigational & Soft Buttons

DB4012 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.

DB4012'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 DB4012. 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: **Primary DNS** 192.168.001.001 , **Network Mask** 255.255.255.000

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: **Manager Port** 162

Front panel buttons usage: Refer to IP address.

Date

Represent date from the calendar.

Example: **Date** 15-Jun-2012

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: **Time** 02:00:00

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 us – before

User Name us – after

[Delete] – Deletes the selected character:

User Name us – before

User Name us – after

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

DAB HOME SCREEN

The DAB home screen contains all the needed information as regards the currently selected station. 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 whether the device is in DAB or DAB+ mode
8. Indicates the audio codec in use
9. Service name
10. Bit Rate and Sample Rate
11. Ensemble name
12. Date and Time – transmitted by DAB/DAB+
13. Indicates whether there is multimedia object transport (MOT) at the current service
14. Genre
15. DLS

Soft Buttons

- [SB1] – **FM** – Switches to the FM Home Screen;
[SB2] – **Levels** – Displays all the mandatory parameters of the current DAB Station. Use [UP] and [DOWN] arrow buttons to scroll through available parameters.



- [SB3] – **Services** – Displays a list containing all services available in the current Ensemble;
[SB4] – **Status** – Displays Device Status Screen ([see “Status” on page 49](#))

FM HOME SCREEN

The FM home screen contains all the needed information as regards the current Station. 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. Frequency Indicator, showing the currently selected frequency, in MHz;
2. Indicator showing the phones audio volume;
3. Indicator showing the signal level at selected antenna input;
4. Indicator for RDS presence of information contained in the received signal;
5. Indicator for Stereophonic Information-contains information about the received signal and currently selected de-emphasis time constant;
6. Decoded PS information from RDS signal;
7. Decoded RT (RadioText) information from RDS signal;
8. Decoded PI/CALL information from RDS signal;
9. Decoded PTY information from RDS signal;
10. Decoded TP information from RDS signal;
11. Decoded TA information from RDS signal;

Soft Buttons

[SB1] – **DAB** – Switches to the DAB Home Screen;

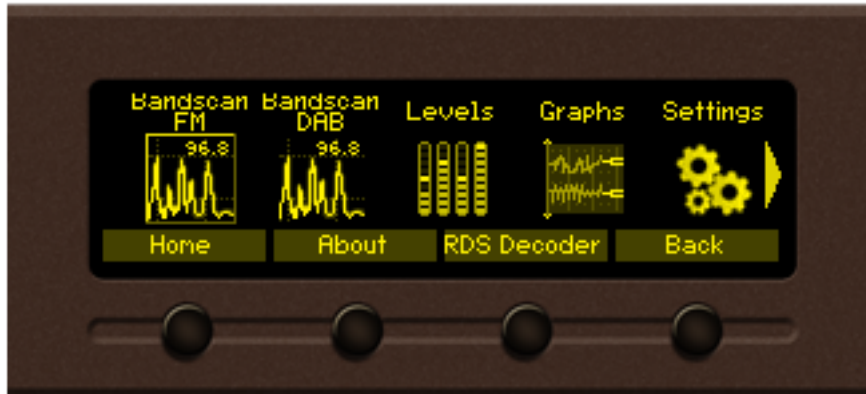
[SB2] – **Levels** – Displays all the mandatory parameters of the current FM Station. Use [UP] and [DOWN] arrow buttons to scroll through available parameters.



[SB3] – **RDS Decoder** – Displays RDS Decoder information of the current FM Station ([see “RDS/RBDS Decoder” on page 46](#));

[SB4] – **Status** – Displays Device Status Screen ([see “Status” on page 49](#))

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. DB4012'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:

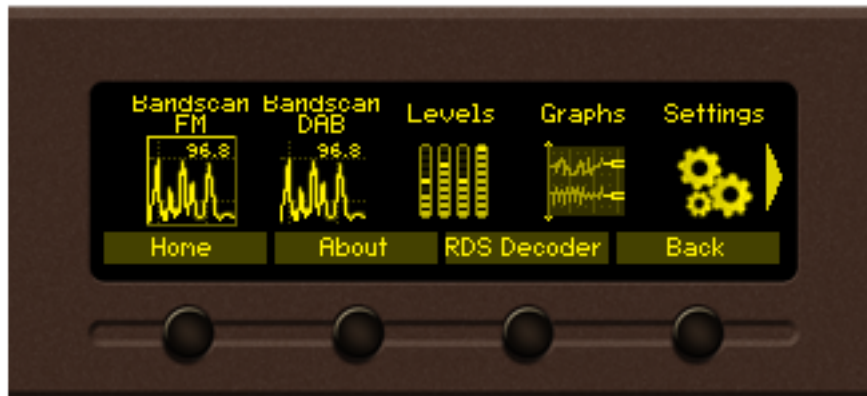
- [SB1] – *Home*
- [SB2] – *About*
- [SB3] – Unused
- [SB4] – *Back*

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 DB4012. The main menu structure has an up-and-down basis, expanded with left-to-right branches.

MENU PAGES

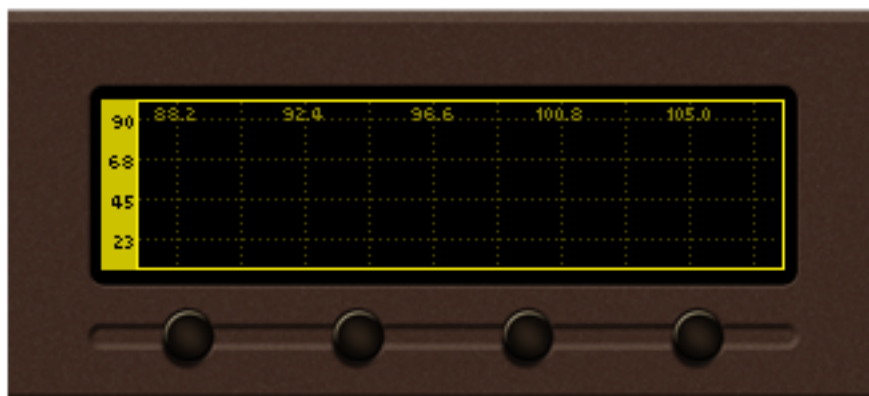


BANDSCAN FM

Upon entering the last *Bandscan* data will be displayed.

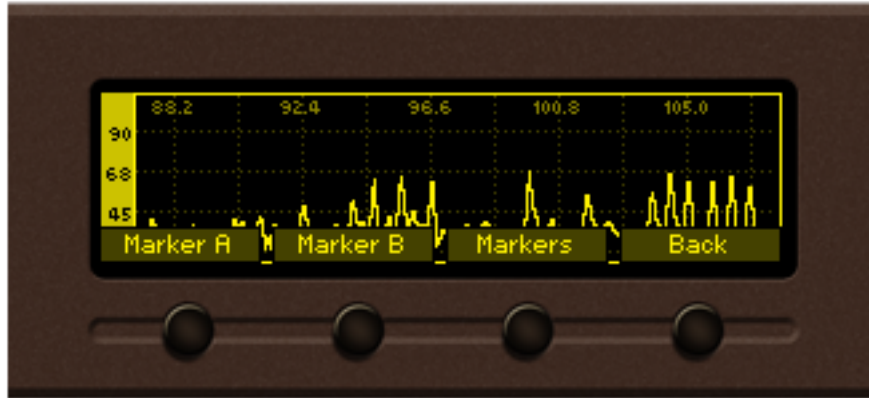


Empty grid will be displayed if no *bandscan* data is available at the moment.



To ensure better reading of the data plot, the *Header area* and the *Soft Buttons* labels will be hidden automatically short time after the soft button is released. Pressing a button will display the function labels again.

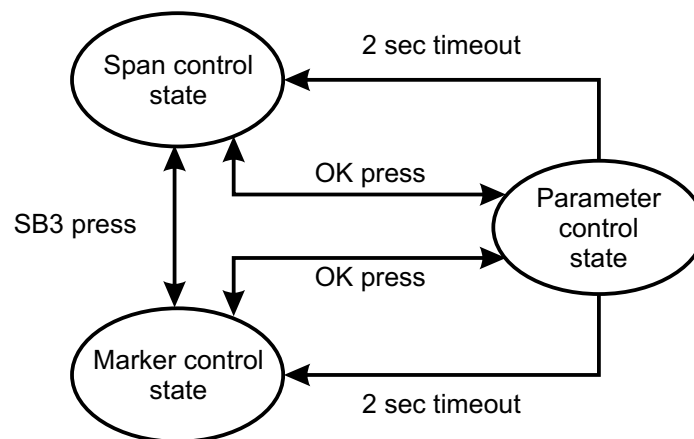
There are three control states in *Bandscan* page – *Span* control, *Marker* control and *Parameter* control. The states can be identified by the labels of the Soft buttons. If the labels appear as shown on the picture below, the page is in *Marker* control state.



For example: When the following menu is selected, pressing [SB3] will change the screen from *Marker* to *Span* control and vice-versa. All Soft buttons labels will change according to the sub-menu. The control state of the page will change upon every [SB3] pressing.

Pressing the [OK] button either in *Marker* or *Span* control state will make transition to *Parameter* control state. The screen will be visible until the [OK] button is pressed again or the timeout of 2 seconds elapses.

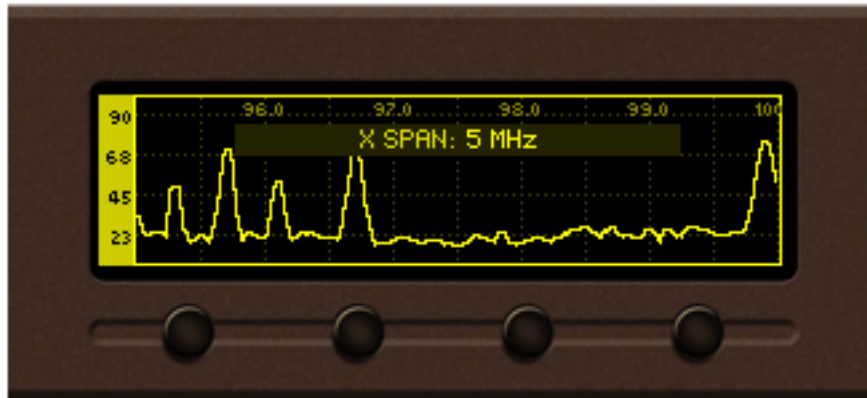
Diagram representing the control state transitions:



Span control state:

[SB1], [SB2] and [Arrow] buttons control the *Span* of the data plot. Depending on the *Span* control state the Soft buttons have different usage.

X Span – [SB1] cycles through available span values for X axis of the data plot. The possible values vary between 3 and 21 MHz in 1 MHz increments. Note that changing X span may also change the center frequency in order to keep data plot in bounds. When a key is pressed next span value will be selected and displayed on the screen.



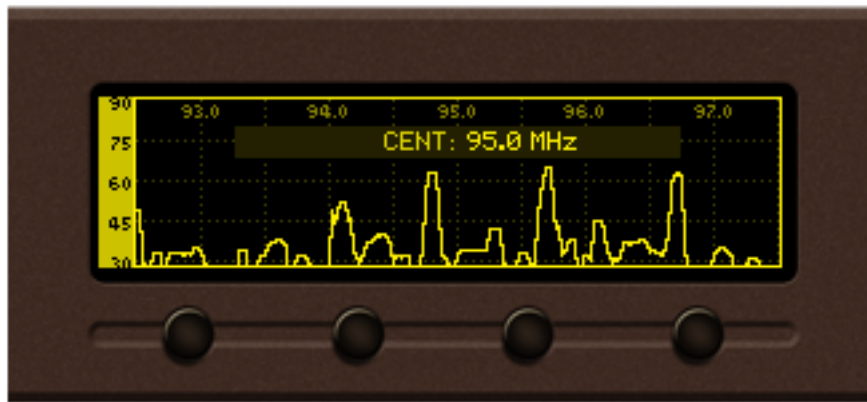
5MHz X span is selected

Y Span – [SB2] cycles through available span values for Y axis of the data plot. The possible values are 30, 60, 90, and 120 dBμV. Note that in order to keep the data plot in bounds changing Y span may also change the Y reference. When the button is pressed new value will be selected and displayed on the screen.



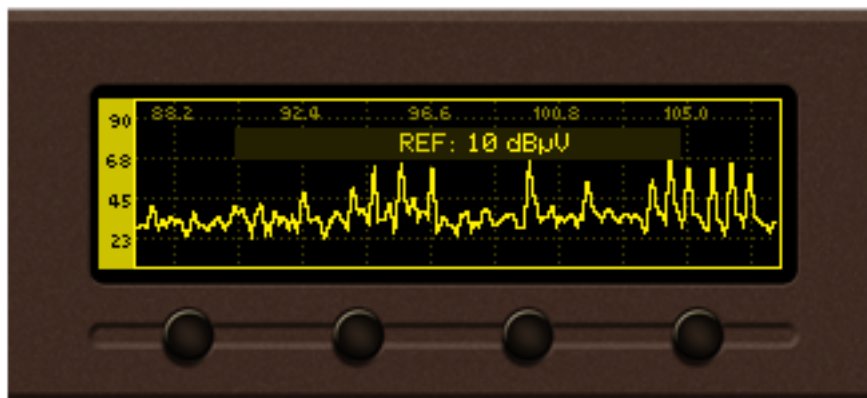
120 dBμV Y span is selected

[LEFT] / [RIGHT] Buttons – change the *center frequency* of the data plot on 500 kHz increments. The center frequency permitted values depend on the currently selected *X span*. The selected center frequency value is briefly displayed on the screen.



95 MHz center frequency is selected

[UP] / [DOWN] Buttons – changes *Y axis reference* (the value for the bottom of the Y scale). Permitted values vary from -20dB μ V to 110dB μ V in 10dB μ V increments. The upper limit of the *Y reference* depends on the currently selected *Y span*. Upon selection, the *Y reference* is briefly displayed on the screen.



10 dB μ V reference is selected

Marker control state:

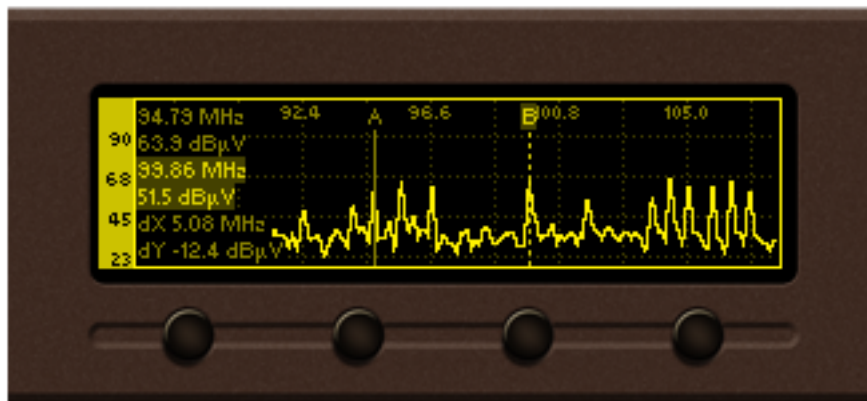
Two markers, named “A” and “B” are available in *Bandscan page*. [SB1], [SB2], [LEFT] and [RIGHT] buttons control the visibility and position of the *Markers*.

Buttons [SB1] / [SB2] control Marker A / Marker B appearance. According to your needs the markers can be:

- hidden – marker is not visible;
- shown – marker is visible but not selected;
- selected – marker is visible and selected.

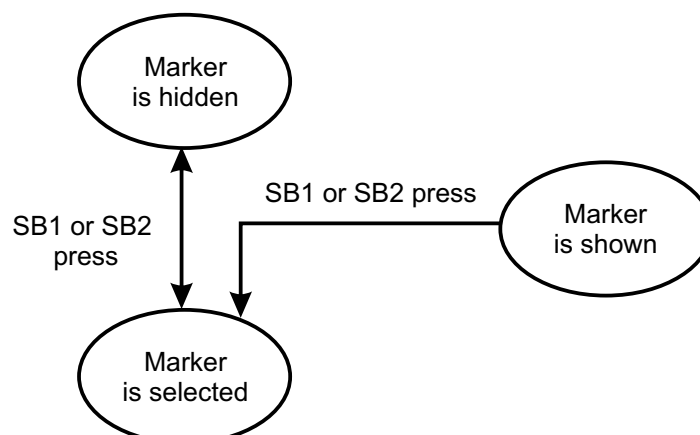
When markers “A” and/or “B” are visible (shown or selected) a readout about X and Y axes will appear on the left side of the data plot. If both markers are visible, the differential “Marker B minus Marker A” value will be displayed at the bottom left of the screen.

The selected marker is represented as highlighted, dashed line; marker’s readout is also highlighted. Only one marker at a time can be selected. If only one of the markers is visible, it will be always selected.



Marker A is shown, Marker B is selected

Following is a diagram explaining the transition between these states:



[LEFT] / [RIGHT] Buttons – move the selected marker to the left or right with one screen pixel increment.

NOTE: The step resolution of marker movement depends from the selected *X span*.

[UP] / [DOWN] Buttons are used to change the *Y reference* like in *Span control* state.

Parameter control state:

Parameter control state allows specific parameters to be set before starting the bandscan.

[OK] – show/hide Parameter control

[Left] / [Right] Buttons – cycle through the available parameters.

[Up] / [Down] Buttons – change the value of the selected parameter.

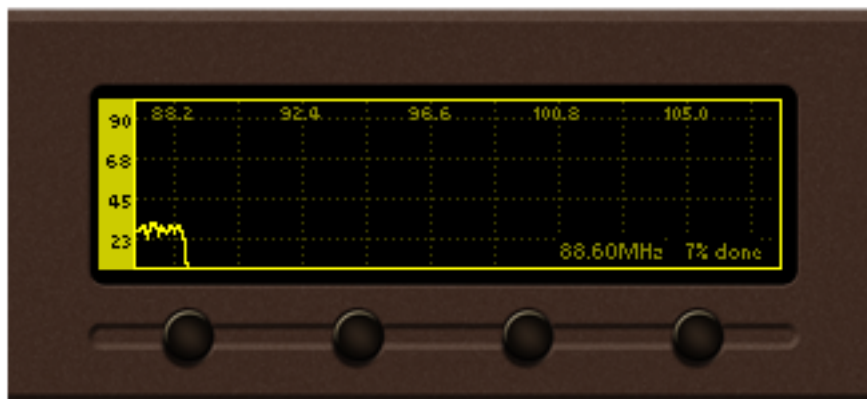
The name and value of the selected parameter appear briefly on the data plot.

NOTE: Parameter control state will automatically disappear from the screen if no button is pressed for 2 seconds.



Bandscan page parameters

Bandscan: Start / Stop – Used for starting/stopping of the *bandscan process*. Information about the progress will be displayed on the right bottom corner of the data plot. Upon completion, the *Bandscan parameter* value will be automatically set to “Stop”.



Bandscan in progress

Running *bandscan* can be stopped manually by setting the *Bandscan parameter* value to “Stop”.

Start Frequency: – set the start frequency of the *bandscan*.

End Frequency: – set the end frequency of the *bandscan*.

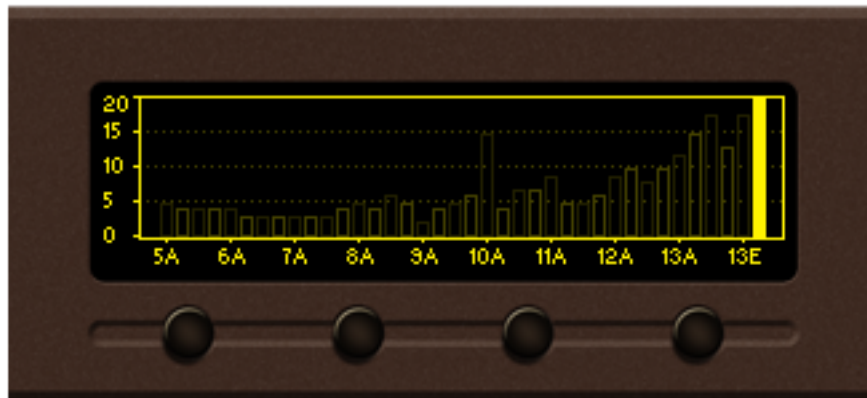
Step: 10, 20, 50 or 100 kHz – set the step increments of the band. Small steps lead to higher resolution but slower *bandscan*;

Pressing [SB4] in *Bandscan page* will lead back to the previous page.

NOTE: Leaving the page will not stop the *bandscan process*. The process will continue until it is finished or the *Bandscan parameter* value is set to “Stop”.

BANDSCAN DAB

Upon enetering the last *Bandscan* data will be displayed.



Empty grid will be displayed if no *bandscan* data is available at the moment.



To ensure better reading of the data plot, the *Header area* and the *Soft Buttons* labels will be hidden automatically short time after the soft button is released. Pressing a button will display the function labels again.

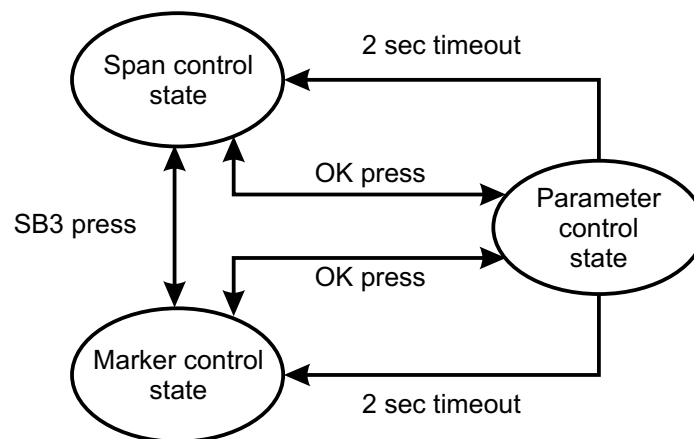
There are three control states in *Bandscan* page – *Span* control, *Marker* control and *Parameter* control. The states can be identified by the labels of the Soft buttons. If the labels appear as shown on the picture below, the page is in *Marker* control state.



For example: When the following menu is selected pressing [SB3] will change the screen from *Marker* to *Span* control and vice-versa. All Soft buttons labels will change according to the sub-menu. The control state of the page will change upon every [SB3] pressing.

Pressing the [OK] button either in *Marker* or *Span* control state will make transition to *Parameter* control state. The screen will be visible until the [OK] button is pressed again or the timeout of 2 seconds elapses.

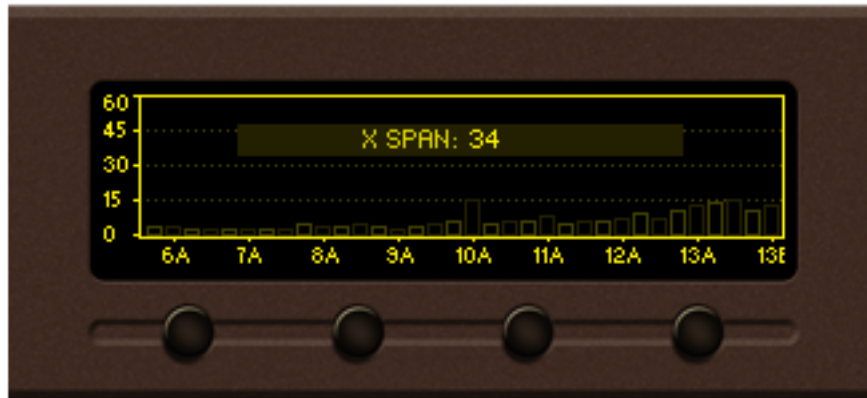
Diagram representing the control state transitions:



Span control state:

[SB1], [SB2] and [Arrow] buttons control the *Span* of the data plot. Depending on the *Span* control state the Soft buttons have different usage.

X Span – [SB1] cycles through available span values for X axis of the data plot. The possible values vary between 26, 30, 34 and 38 channels. Note that changing X span may also change the center frequency in order to keep data plot in bounds. When a key is pressed next span value will be selected and displayed on the screen.



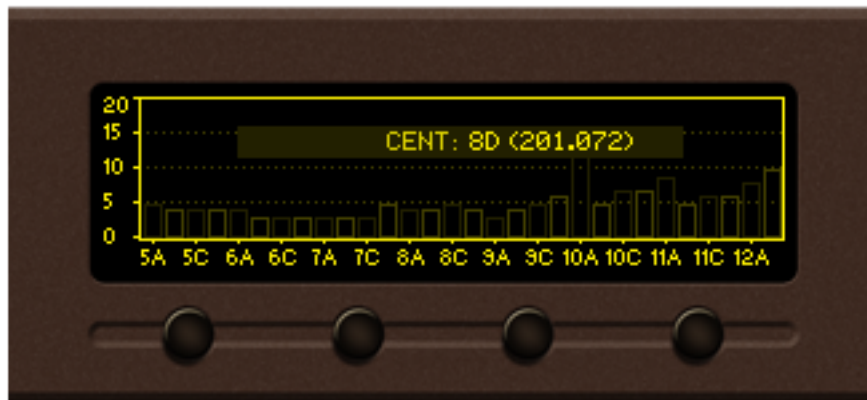
34 X span is selected

Y Span – [SB2] cycles through available span values for Y axis of the data plot. The possible values are 20, 30, 40, 50 and 60 dB μ V. Note that in order to keep the data plot in bounds changing Y span may also change the Y reference. When the button is pressed new value will be selected and displayed on the screen.



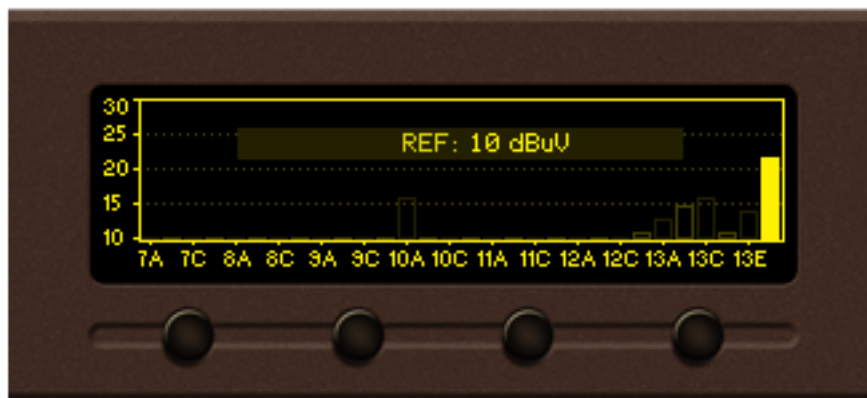
20 dB μ V Y span is selected

[LEFT] / [RIGHT] Buttons – change the *center channel (frequency)* of the data plot on 1 channel increments. The center channel permitted values depend on the currently selected *X span*. The selected center channel(frequency) value is briefly displayed on the screen.



8D center channel is selected

[UP] / [DOWN] Buttons – changes *Y axis reference* (the value for the bottom of the Y scale). Permitted values vary from 0dB μ V to 40dB μ V in 10dB μ V increments. The upper limit of the *Y reference* depends on the currently selected *Y span*. Upon selection, the *Y reference* is briefly displayed on the screen.



10 dB μ V reference is selected

Marker control state:

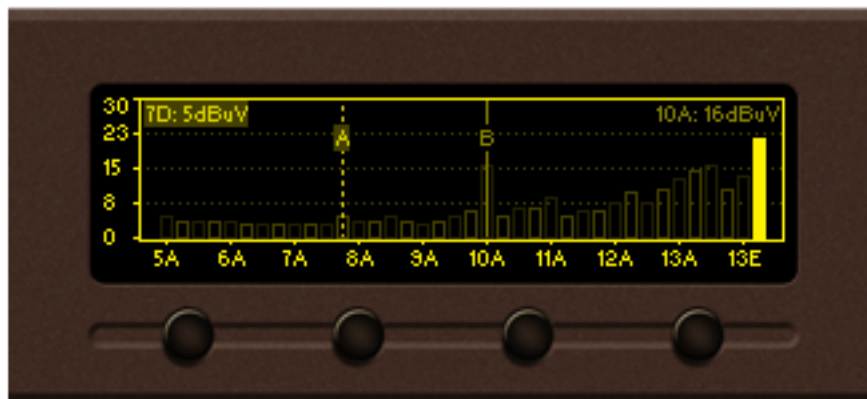
Two markers, named “A” and “B” are available in *Bandscan page*. [SB1], [SB2], [LEFT] and [RIGHT] buttons control the visibility and position of the *Markers*.

Buttons [SB1] / [SB2] control Marker A / Marker B appearance. According to your needs the markers can be:

- hidden – marker is not visible;
- shown – marker is visible but not selected;
- selected – marker is visible and selected.

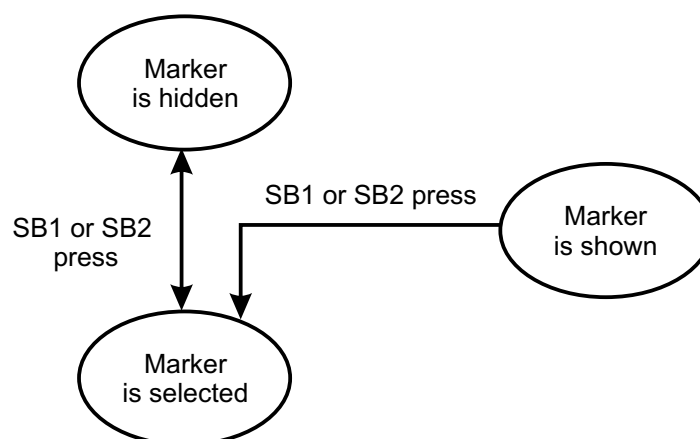
When markers “A” and/or “B” are visible (shown or selected) a readout about X and Y axes will appear on the left side of the data plot.

The selected marker is represented as highlighted, dashed line; marker’s readout is also highlighted. Only one marker at a time can be selected. If only one of the markers is visible, it will be always selected.



Marker A is selected, Marker B is shown

Following is a diagram explaining the transition between these states:



[LEFT] / [RIGHT] Buttons – move the selected marker to the left or right with one screen pixel increment.

NOTE: The step resolution of marker movement depends from the selected *X span*.

[UP] / [DOWN] Buttons are used to change the *Y reference* like in *Span control* state.

Parameter control state:

Parameter control state allows specific parameters to be set before starting the bandscan.

[OK] – show/hide Parameter control

[Left] / [Right] Buttons – cycle through the available parameters.

[Up] / [Down] Buttons – change the value of the selected parameter.

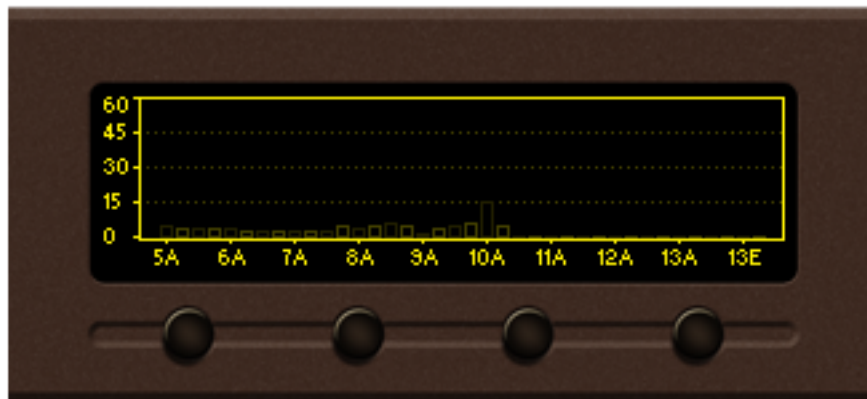
The name and value of the selected parameter appear briefly on the data plot.

NOTE: Parameter control state will automatically disappear from the screen if no button is pressed for 2 seconds.



Bandscan page parameters

Bandscan: Start / Stop – Used for starting/stopping of the *bandscan process*. Information about the progress will be displayed on the right bottom corner of the data plot. Upon completion, the *Bandscan parameter* value will be automatically set to “Stop”.



Bandscan in progress

Running *bandscan* can be stopped manually by setting the *Bandscan parameter* value to “Stop”.

Start Channel: – set the start frequency of the *bandscan*.

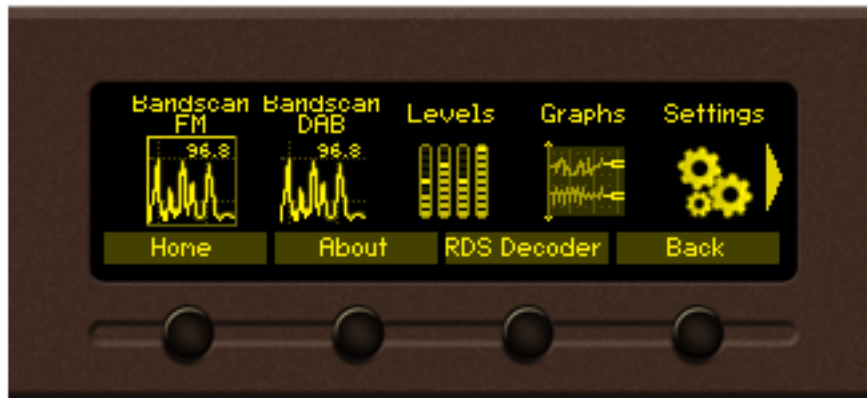
End Channel: – set the end frequency of the *bandscan*.

Pressing [SB4] in *Bandscan page* will lead back to the previous page.

NOTE: Leaving the page will not stop the *bandscan process*. The process will continue until it is finished or the *Bandscan parameter* value is set to “Stop”.

LEVELS

Enter the *Main Menu* page and select the *Level* icon, press [OK] button to enter the menu.



Levels page shows bar graph representation of the different signals, measured by DB4012. The parameters are divided into groups. Each bar graph displays the low, average and high values of the signal. The number in the center below represents the average value. The shaded color number, placed on the left and right bottom edges, denotes the measurement range of the signal. Measurement units and name of the signal are written above the corresponding bar graph.

Buttons usage:

- [OK] – leads to Main menu page;
- [Up]/[Down] – Changes the currently displayed bar graph group;
- [SB1] – Switches between FM and DAB Levels;
- [SB2] – lead to Home Screen;
- [SB3] – leads to RDS Decoder ([see “RDS/RBDS Decoder” on page 46](#)) when in FM and to a list containing all Services available in the current Ensemble when in DAB
- [SB4] – leads to Status Screen ([see “Status” on page 49](#))

FM Levels



FM Group 1. RF, Multipath and Frequency offset parameters



FM Group 2. Left, Right, Left+Right, Left-Right parameters



FM Group 3. Loudness related parameters



FM Group 4. Reception quality related levels

DAB Levels



DAB Group 1. RF, SNR, FIC, CNR parameters



DAB Group 2. Left and Right Audio parameters



DAB Group 3. Loudness related parameters

RDS/RBDS DECODER



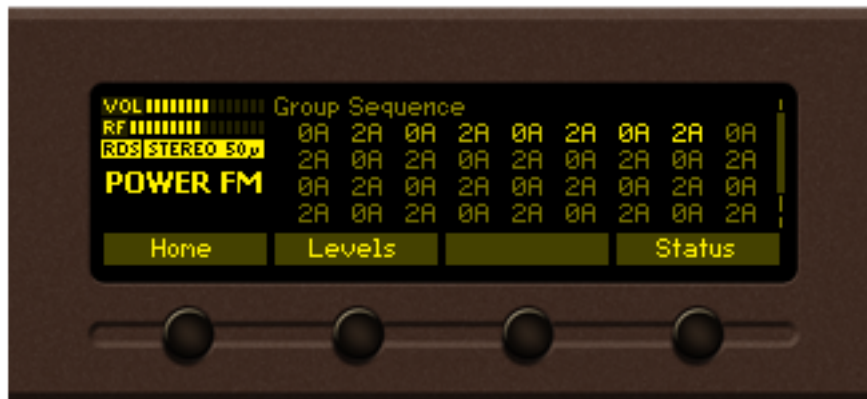
RDS/RBDS Page Main View



RDS/RBDS AF list View



RDS/RBDS Statistics view



RDS/RBDS Sequence view



RDS/RBDS RAW Data view

Front panel buttons usage:

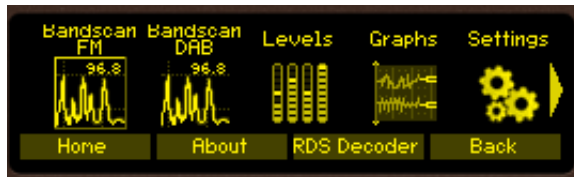
[OK] – leads to Main menu page.

[Up]/[Down] – Changes the currently displayed RDS decoder screen.

[SB1]-[SB4] – lead to different screens of the menu.

SETTINGS

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



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

- **Tuner FM** - allows you to change the Tuner related settings as **Frequency**, **Frequency Step**, **De-emphasis**, **RDS Mode**, **IF Bandwidth**, **Stereo Blend**, **High Cut**, **High Blend**, **Soft Mute**, **Audio Cut** as well as **Average** and **Peak** function parameters.
- **Tuner DAB** - allows you to change **DAB Channel** and **DAB Time Zone**.
- **Communication** – grants you access to the *General Setup* (to enable or disable the functions included in the menu), **Ethernet**, **SNMP**, **HTTP**, **FTP**, **SNTP** and **Email**.
- **Security** – From here you could set-up, change or disable the password protected access to the *Front Panel* or *Remote access*.
- **Logger FM** – Trough this section, FM Channels could be chosen and monitored, by applying the needed settings.
- **Logger DAB** – Trough this section, DAB Channels could be chosen and monitored, by applying the needed settings.
- **GP Outputs** – The General Purpose Outputs settings are applied through this page. **Function**, **Type** and **Pulse Time** for each of the GPOs could be set individually.
- **Device** – allows you to change the name of the device, set-up the *Date/Time*, change the default settings of the OLED graphical display (menu *Front panel*), change the *Home Screen*, specify the *Weblog Max Days*, average and peak values and finally to return the device to its *Factory Defaults*. *Country Region* allows you to specify the region in which the device will be used - Europe, USA and Japan. The RDS standard utilized will be changed accordingly.

STATUS

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



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;



SECURITY

Keyboard lock

To prevent unauthorized local access, the DB4012 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, DB4012 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.

HOW TO START A LOGGER CAMPAIGN USING THE FRONT PANEL MENU?

In order to set up a campaign via the front panel menu, the following steps should be completed:

1. Press the [OK] button to enter the **Main menu> Settings** and again press [OK];
2. Then select **Logger XX> Channel I**;
3. Specify name of the Channel, frequency and for 'Active' - select Antenna 1; to exclude a station from the campaign the "Disable" button should be selected;
4. Change the Acquisition time as per your preferences. We recommend setting it to 10 seconds;
5. Change the alarm parameters as per your preferences;
6. Steps from 2 to 4 should be applied for each of the channels to be monitored. Once all Channels are set you can proceed to the last step
7. Go to **Settings> Logger XX> Logger Mode** and as a value set 10 seconds. In order for a campaign to be commenced the device should be inactive for the specified time.

NOTE: The front panel inactivity time should expire prior the Logger mode countdown to begin.

WEB Interface

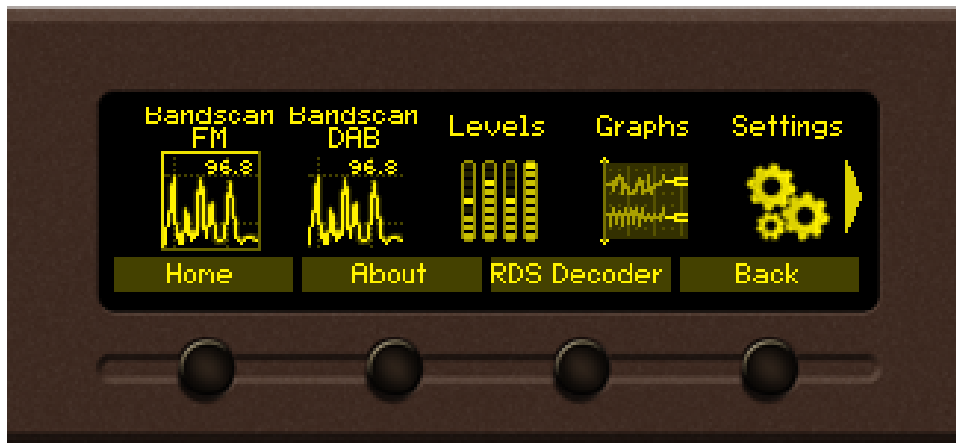
DB4012 can be controlled through the built-in web server. A standard web browser can be used to monitor the status of the device or to make some adjustments.

There are two options for access to the WEB Interface of DB4012. The first one is through manual identification of the IP address of the device, and the second one is through the Network discovery option (For Windows 7 and above users only).

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 you will be enabled to enter the device main menu.

Using the [RIGHT] navigational button find the “*Status*” section, located at the end of the Menu.

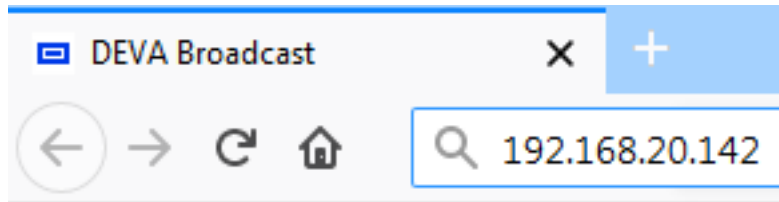


Press the [OK] Button to enter the “*Status*” section. Via the Front panel navigational menu press the [DOWN] button.



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.

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 “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, DB4012 will be automatically added to the Device list section. The device will be ready for usage and no additional adjustments will be required except for user name and password.

ACCESS

The DB4012 provides you with a protected access to the device settings. You can choose between two types of log in:

1. **As an Administrator** – which 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*).

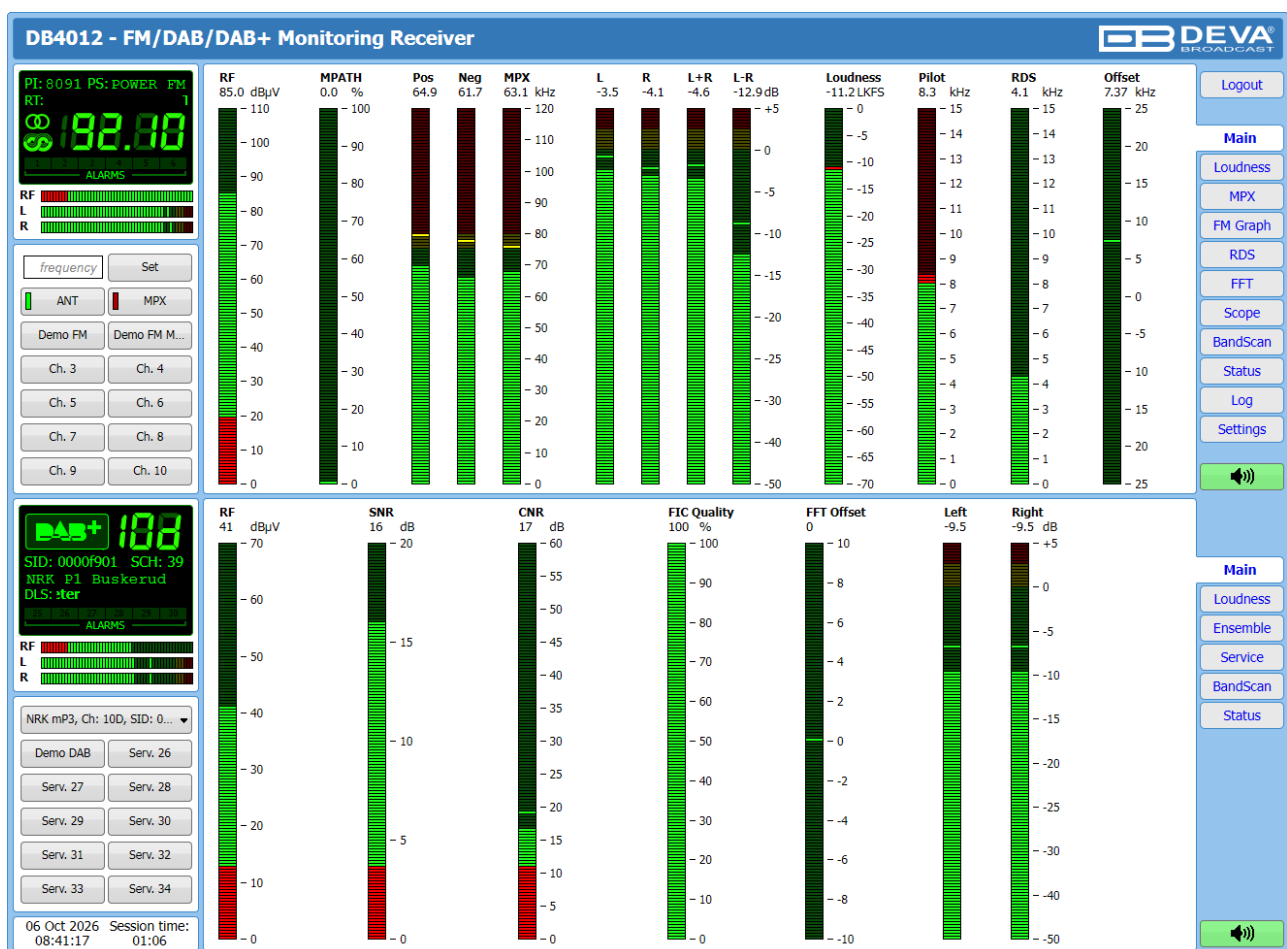
In order to make the necessary adjustments to the device, please log in as Administrator.

WEB Interface Structure

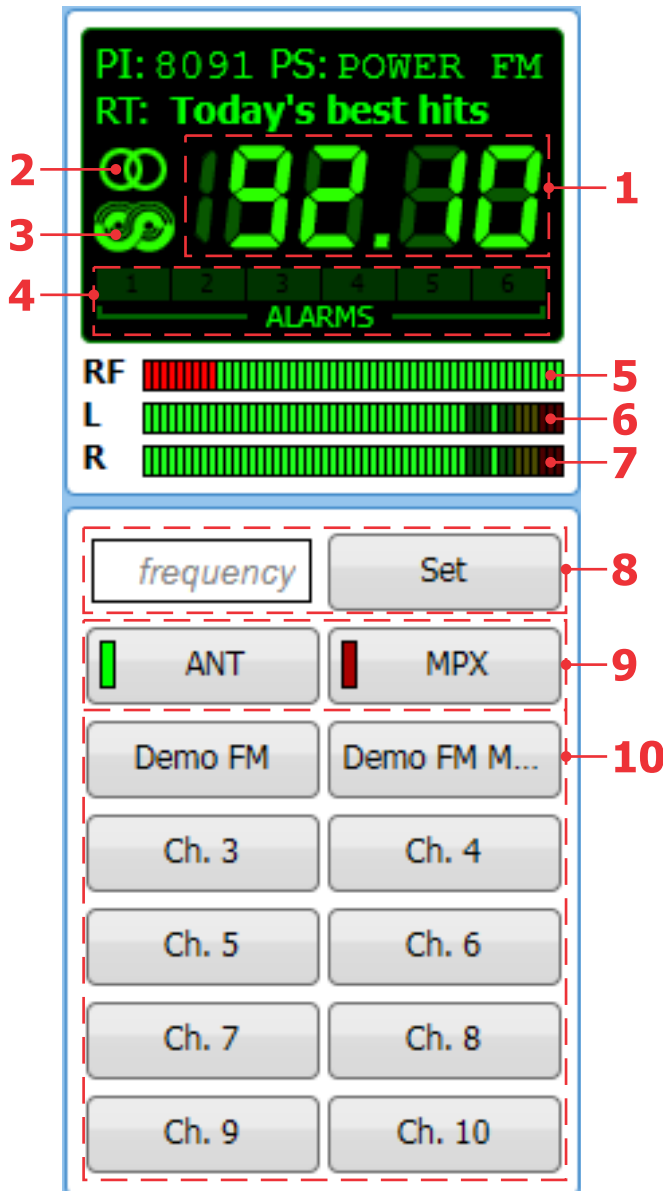
DEVICE CONTROL INTERFACE

The WEB Interface is visually divided into two Main sections – FM (located at the upper part of the screen) and DAB/DAB+ (located at the lower part of the screen). Every Main Section is subdivided 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.

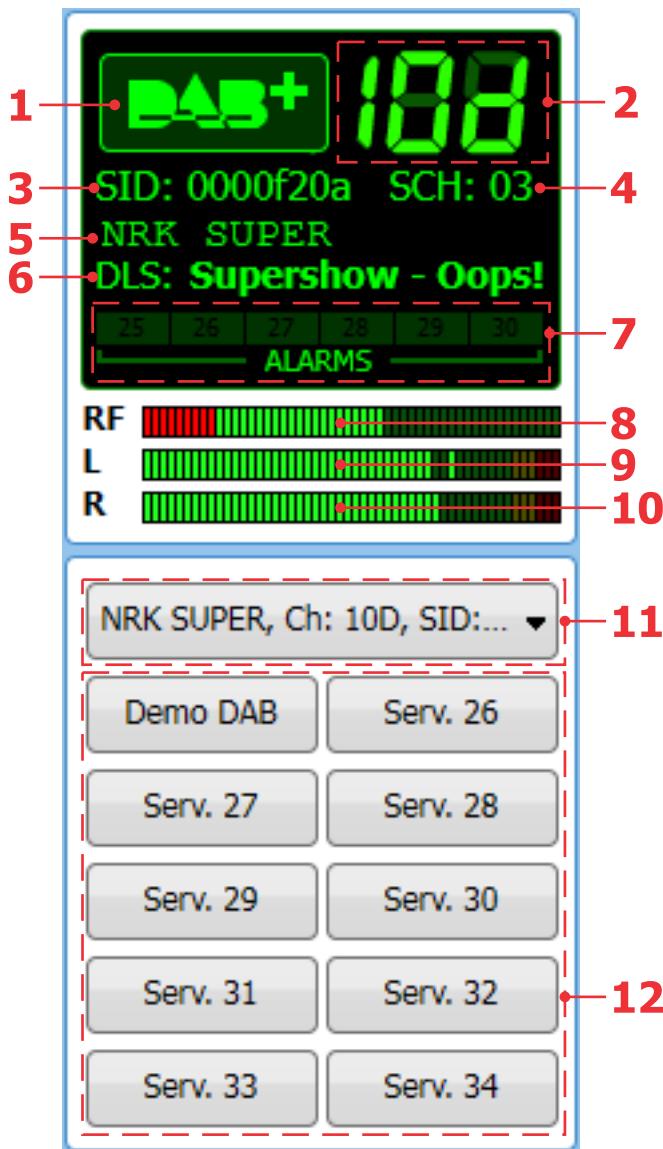


FM DASHBOARD

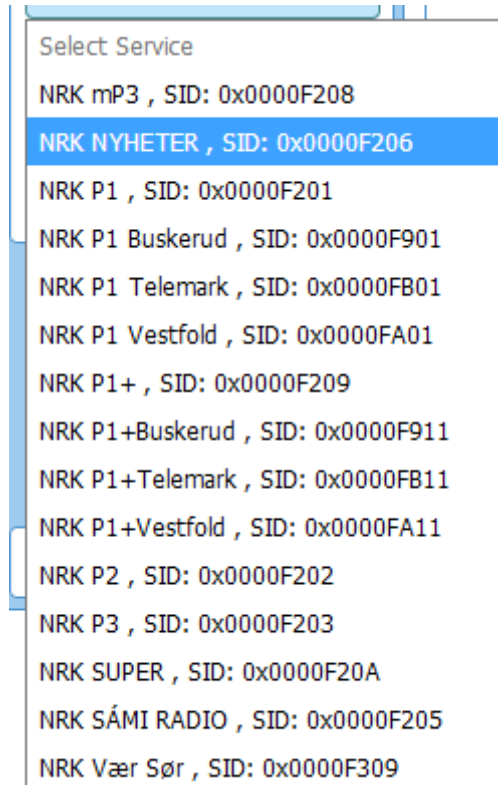


1. Frequency indicator showing currently tuned frequency;
2. Stereo indicator;
3. RDS/RBDS presence indicator;
4. Channel Alarms indicator – will be lit in red when the Logger has detected an alarm on channel;
5. RF Level indicator. The red zone (low level) indicates low RF level;
6. Left Audio Indicator;
7. Right Audio indicator;
8. Frequency set buttons;
9. Antenna or MPX Input;
10. Channel Preset Buttons – when one of the buttons is pressed, the Tuner will be set to the predefined frequency.

DAB/DAB+ DASHBOARD



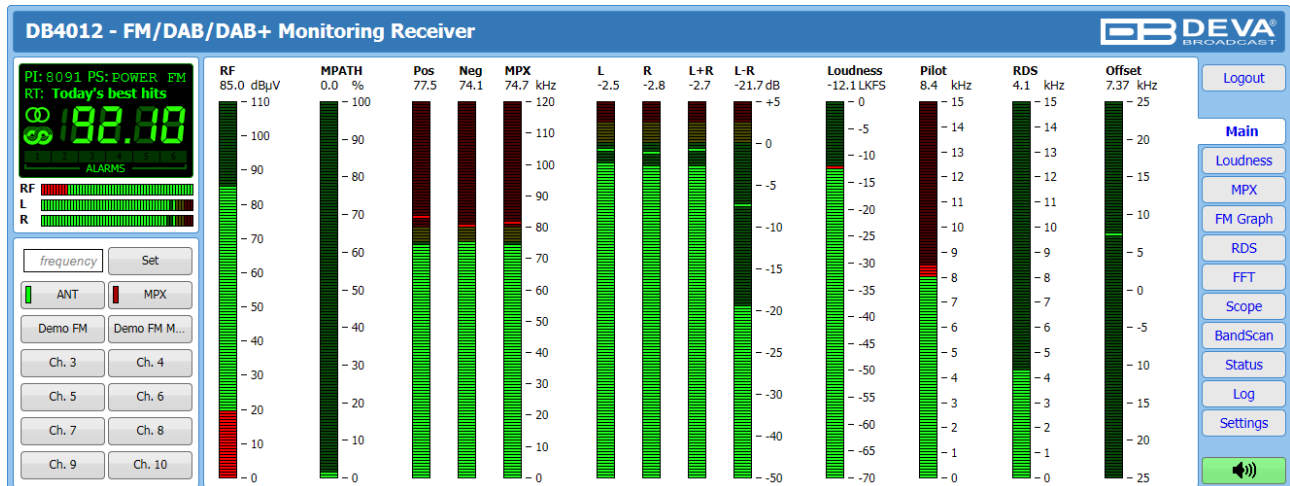
1. DAB/DAB+ signal lock indicator;
2. Frequency indicator showing currently tuned frequency;
3. SID – This 16-bit field shall specify the DAB Service Identifier (SID) to which the information block data applies;
4. SCH – Sub Channel ID;
5. Currently selected service label;
6. DLS – (Dynamic Label Segment) 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. Drop-down Select Service menu – A list containing all services available in the current Ensemble.



12. Service Preset Buttons – when one of the buttons is pressed, the Tuner will be set to the predefined service.

WEB Interface FM Section

MAIN



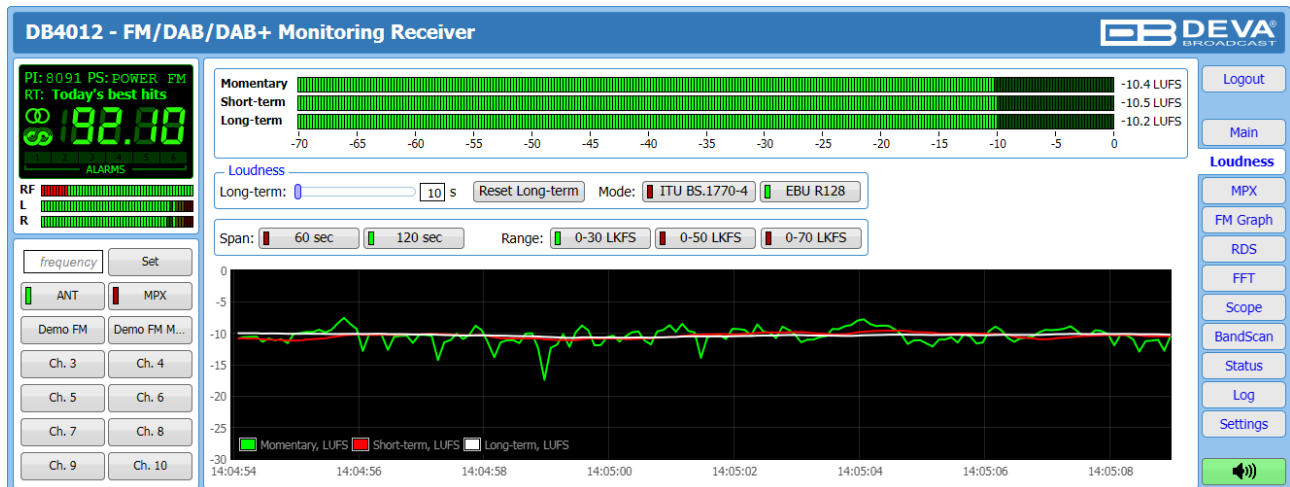
This Screen shows all the mandatory parameters represented as LED readings. You can easily select the preferred audio frequency using the selection buttons, placed on the left part of the screen. All station presets are defined by the user.

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

NOTE:

- The FM tuner uses **Antenna 1** as its RF input.
- The DAB/DAB+ tuner uses **Antenna 2** as its RF input.

LOUDNESS



The average program loudness measurements as defined by the ITU BS.1770-4 and EBU R128 recommendations are represented at this page. The following measurements are available:

- **Momentary** – average program loudness measured over a 0.4 seconds sliding time window, not gated;
- **Short-term** – average program loudness measured over a 3 seconds sliding time window, not gated;
- **Long-term** – average program loudness measured over a variable sliding time window, gated as described in ITU BS.1770-4. The time window can be varied between 10 seconds and 120 seconds.

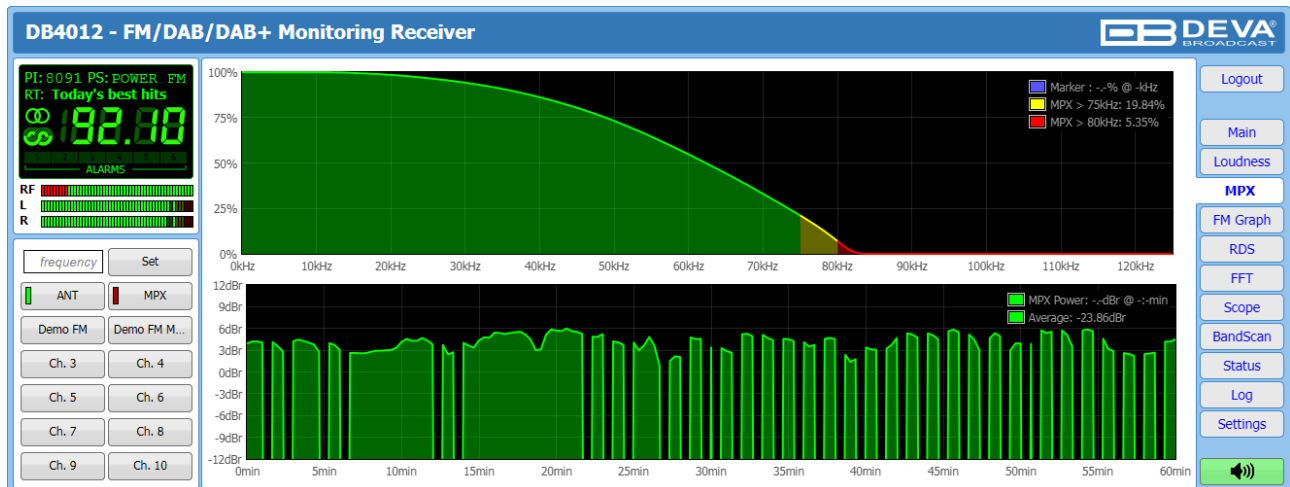
The page offers all the above measurements in two display forms – high refresh rate bar graphs for displaying current values and a time graph for extended visualization over time.

The user can modify the processing and appearance of the measurement using the following settings:

- **Long-term** – allows the user to select the length of the Long-term loudness measurement sliding time window. The time-based sliding window could be set with length from 10 to 120 seconds;
- **[Reset Long-term]** – resets the Long-term measurement;
- **Mode** – allows the user to select/change between [ITU BS.1770-4] and [EBU R128] mode;
- **Span** – sets the time graph span. Options of [60 seconds] and [120 seconds] are available;
- **Range** – the option buttons allow the user to set the preferred time graph measurement range.

IMPORTANT NOTE: Depending on the currently opened screen, the Loudness meter incorporated in the DB4012 switches between FM and DAB/DAB+.

MPX

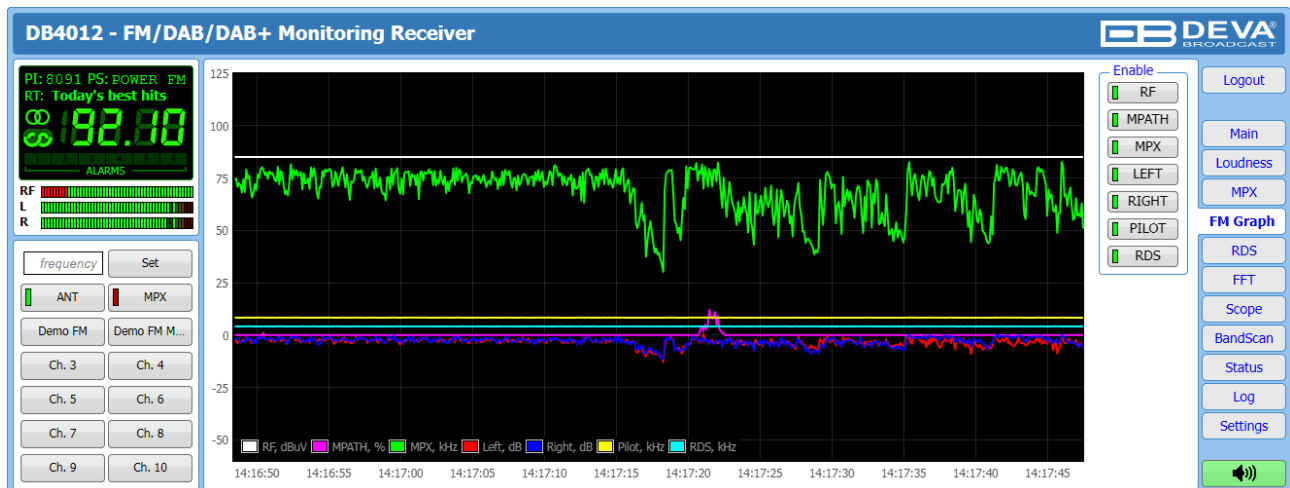


The graphic represents the MPX Deviation overshoot (in percentage) over time. Standard overshoot is measured at 75 kHz and is indicated in the top right corner of the graphic.

The graphic below represents MPX Power over the time span of 60 min. This signal has an initial integration time of 1 min, after that a new sample will be available every 20 seconds.

The radio frequency to be observed could be easily set by using the preset buttons, placed on the left part of the screen.

FM GRAPH

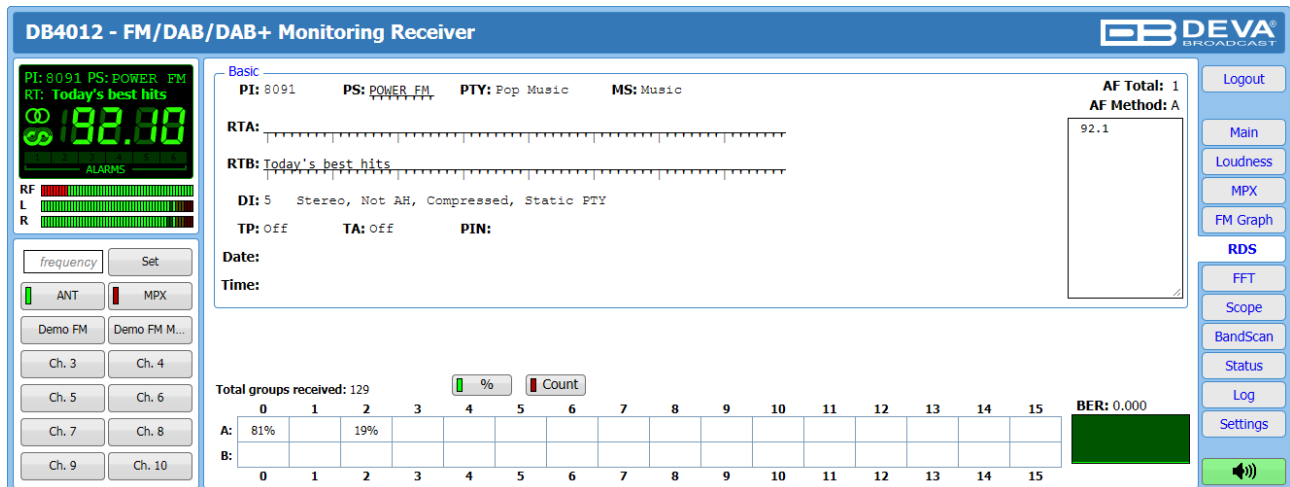


This screen represents all mandatory signals over the time span of 1 minute. All parameters have own color representation and measurement units, visible below the graph.

According to your needs, the signals listed on the right part of the dialog window, can be visible or hidden. Click on the corresponding button in order for a parameter to be displayed/hidden.

The radio frequency to be observed could be easily set by using the preset buttons, placed on the left part of the screen.

RDS



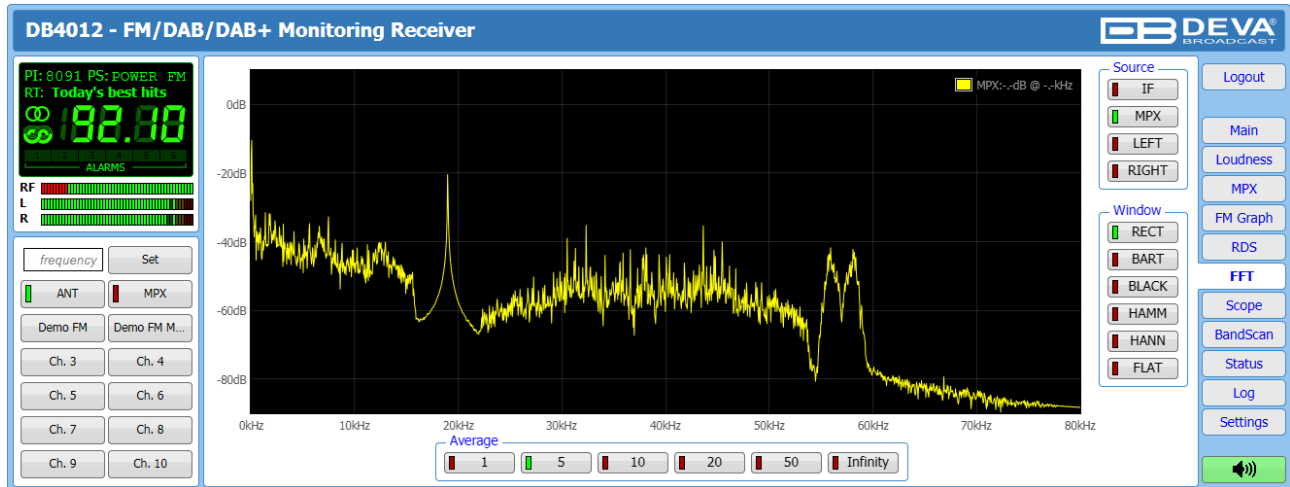
All basic elements of the RDS/RBDS are displayed on the screen – PI, PS, RT, TA/TP, etc. The Alternative frequencies are also available, represented in a list.

Total groups Indicator – all received groups are systematized into a table, representing the percentage/quantity of the groups in the received RDS/RBDS signal. The user selects how the “Total groups received” data should be represented: as Percents (%) or as Count, by selecting the corresponding button.

A BER Indicator with graphics is placed at the right bottom part of the screen, showing 60 sec. history of the BER quantities.

NOTE: The bit error rate or bit error ratio (BER) is the number of bit errors, divided by the total number of transferred bits during the observed time interval. Result closer or equal to 0 indicates that no bit errors are detected and vice versa - result closer or equal to 1 indicates that the received transferred bits are only errors.

FFT



The spectrum analyzer tab is a very useful feature: It is an IF, MPX and Audio spectrum display. Initially it shows the IF from -250 to 250kHz, so that the readings of the currently selected source to be clearly visible.

The signal source to be calculated and visualized is chosen from the Source section, placed on the right part of the screen. Spectral components of the selected signal are determined on the basis of Fast Fourier Transform.

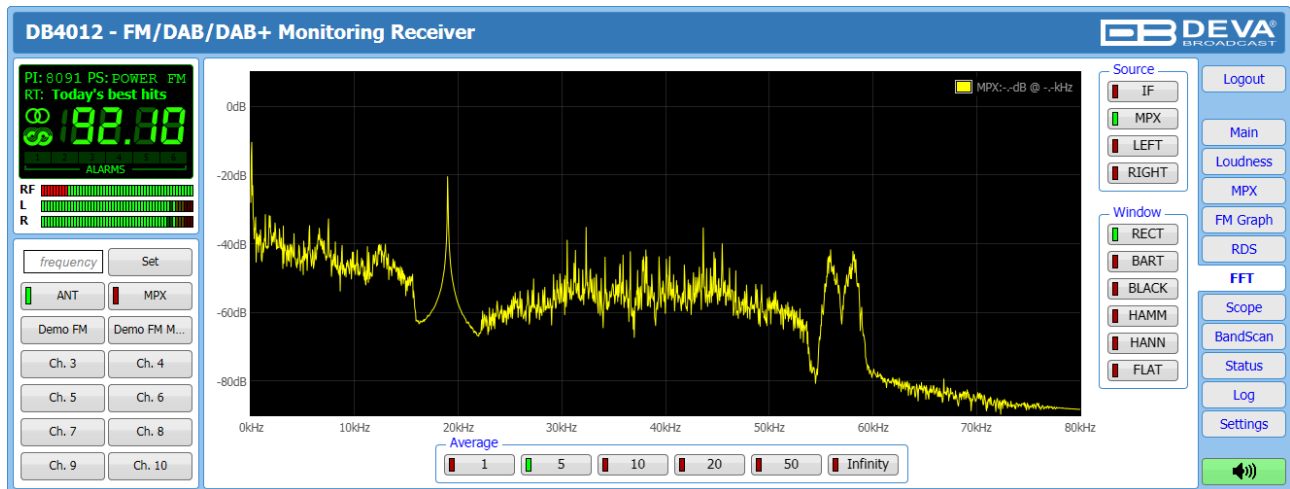
The window function can be selected through the relevant menu via the interactive buttons. The available windows and their features are given below. This table can be used to help you choose the best windowing function for each application.

Window	Best type for these Signal Types	Frequency Resolution	Spectral Leakage	Amplitude Accuracy
Rectangle	Transient & Synchronous Sampling	Best	Poor	Poor
Barlett	Random	Good	Fair	Fair
Blackman	Random or mixed	Poor	Best	Good
Hamming	Random	Good	Fair	Fair
Von Hann	Random	Good	Good	Fair
Flat-top	Sinusoids	Poor	Good	Best

The visualized Spectrum waveform is equivalent of the average value of several measurements which are defined in section “Average”.

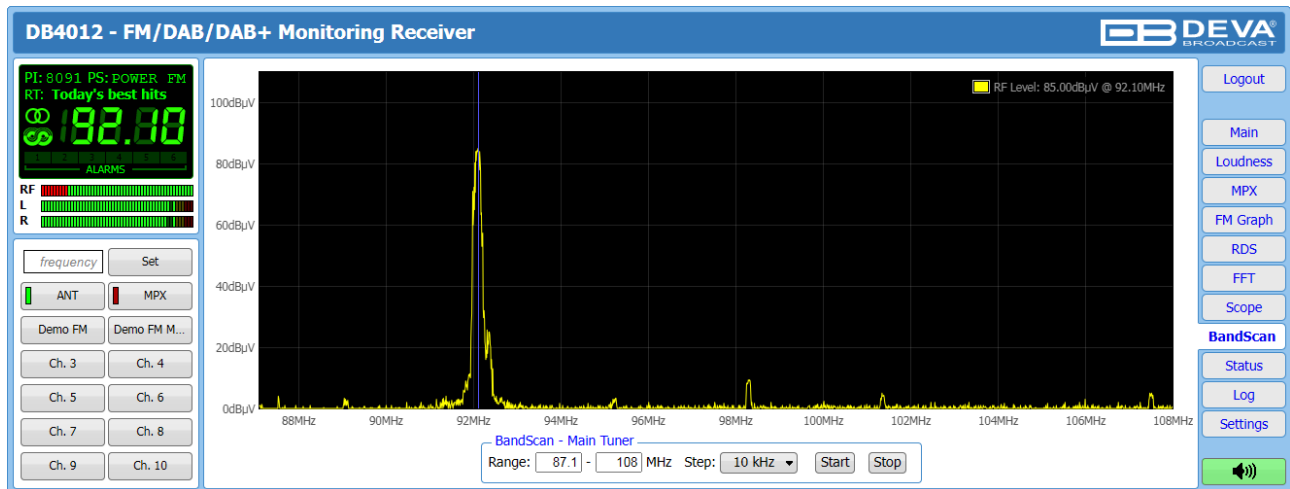
The radio frequency to be observed could be easily set by using the preset buttons, placed on the left part of the screen.

SCOPE



Scope screen represents the signals participating in the process of demodulating and stereo decoding over time. In order for the signal source to be changed, the corresponding button on the right-side of the graph should be pressed.

BANDSCAN

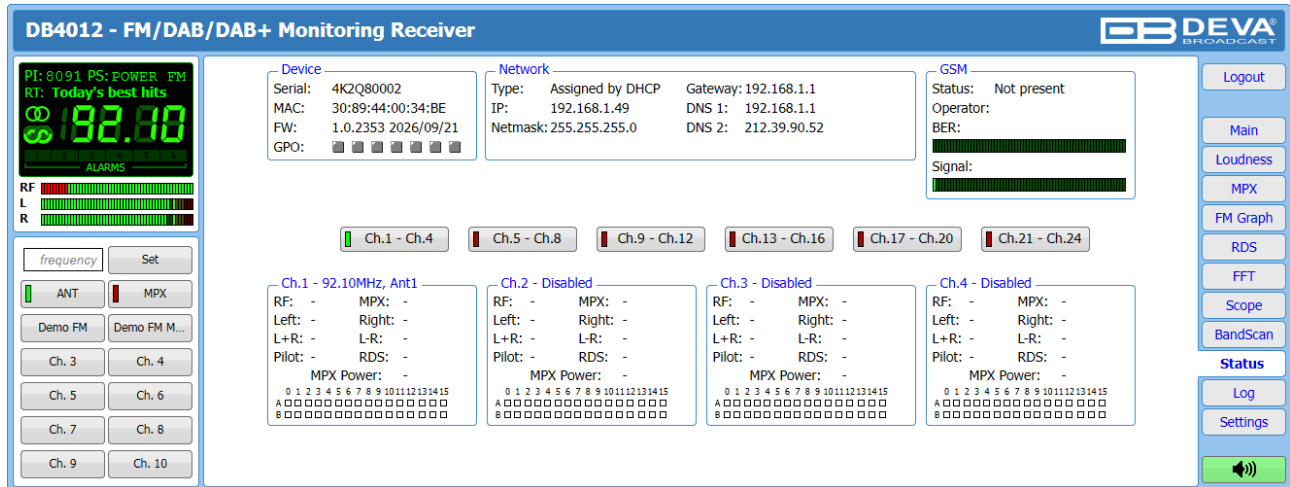


This Screen evaluates FM broadcast band congestion by sweeping the tuner across the FM band, logging every carrier and generating a spectrum display of carrier level vs. frequency.

The Bandsan application utilizes four different types of Bandsan, 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 Bandsan 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



The status tab shows the alarm status of each parameter of the preset frequencies, along with the basic device and network status (IP address, MAC, etc.).

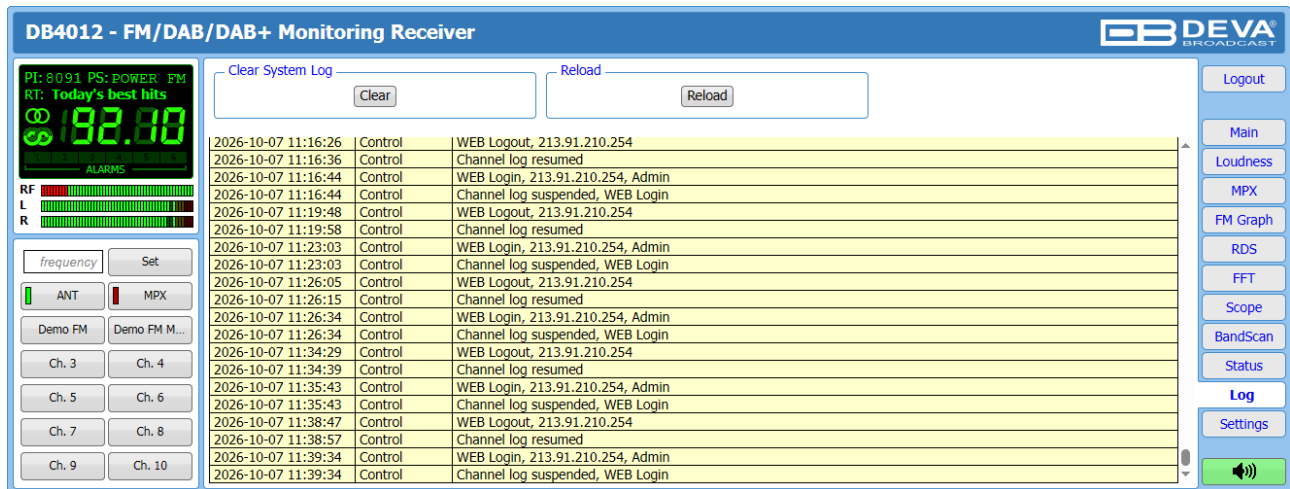
The Channel parameters (RF, MPX, Pilot etc.) have several conditions:

- In range - green OK;
- Out of range - red LO or HI;
- Signal monitoring is not enabled - n/a.

The status of the RDS/RBDS Groups Alarm is displayed on the bottom of the channels' section:

- Green - RDS/RBDS Group is received;
- Red - RDS/RBDS Group is not received and an alarm has been triggered;
- White (blank) - RDS/RBDS Group is not received and no alarm has been triggered.

LOG



The screenshot shows the 'DB4012 - FM/DAB/DAB+ Monitoring Receiver' web interface. The 'Log' section is active, displaying a list of system events. The interface includes a top navigation bar with the DEVA logo and a sidebar with buttons for Logout, Main, Loudness, MPX, FM Graph, RDS, FFT, Scope, BandScan, Status, Log (selected), and Settings. The main content area has a 'Clear System Log' button and a 'Reload' button. The log table contains the following data:

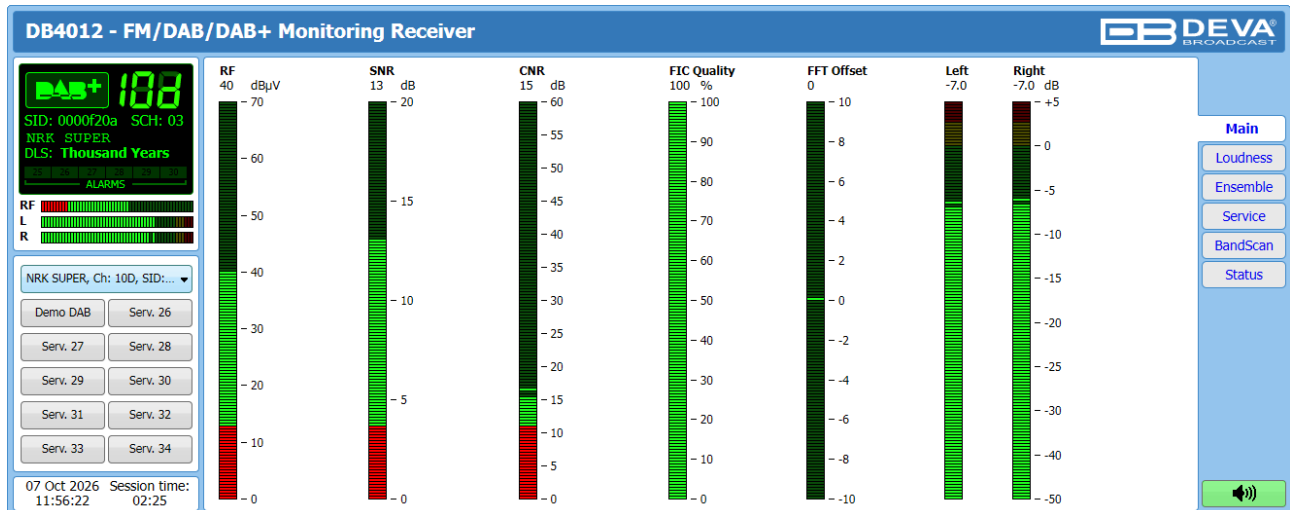
Date/Time	Control	Event
2026-10-07 11:16:26	Control	WEB Logout, 213.91.210.254
2026-10-07 11:16:36	Control	Channel log resumed
2026-10-07 11:16:44	Control	WEB Login, 213.91.210.254, Admin
2026-10-07 11:16:44	Control	Channel log suspended, WEB Login
2026-10-07 11:19:48	Control	WEB Logout, 213.91.210.254
2026-10-07 11:19:58	Control	Channel log resumed
2026-10-07 11:23:03	Control	WEB Login, 213.91.210.254, Admin
2026-10-07 11:23:03	Control	Channel log suspended, WEB Login
2026-10-07 11:26:05	Control	WEB Logout, 213.91.210.254
2026-10-07 11:26:15	Control	Channel log resumed
2026-10-07 11:26:34	Control	WEB Login, 213.91.210.254, Admin
2026-10-07 11:26:34	Control	Channel log suspended, WEB Login
2026-10-07 11:34:29	Control	WEB Logout, 213.91.210.254
2026-10-07 11:34:39	Control	Channel log resumed
2026-10-07 11:35:43	Control	WEB Login, 213.91.210.254, Admin
2026-10-07 11:35:43	Control	Channel log suspended, WEB Login
2026-10-07 11:38:47	Control	WEB Logout, 213.91.210.254
2026-10-07 11:38:57	Control	Channel log resumed
2026-10-07 11:39:34	Control	WEB Login, 213.91.210.254, Admin
2026-10-07 11:39:34	Control	Channel log suspended, WEB Login

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 between the DB4012 and an FTP Client should be configured, please [refer to "Download files via FTP" on page 92](#).

WEB Interface DAB/DAB+ Section

MAIN



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).

NOTE:

- The FM tuner uses **Antenna 1** as its RF input.
- The DAB/DAB+ tuner uses **Antenna 2** as its RF input.

LOUDNESS



The average program loudness measurements as defined by the ITU BS.1770-4 and EBU R128 recommendations are represented at this page. The following measurements are available:

- **Momentary** – average program loudness measured over a 0.4 seconds sliding time window, not gated;
- **Short-term** – average program loudness measured over a 3 seconds sliding time window, not gated;
- **Long-term** – average program loudness measured over a variable sliding time window, gated as described in ITU BS.1770-4. The time window can be varied between 10 seconds and 120 seconds.

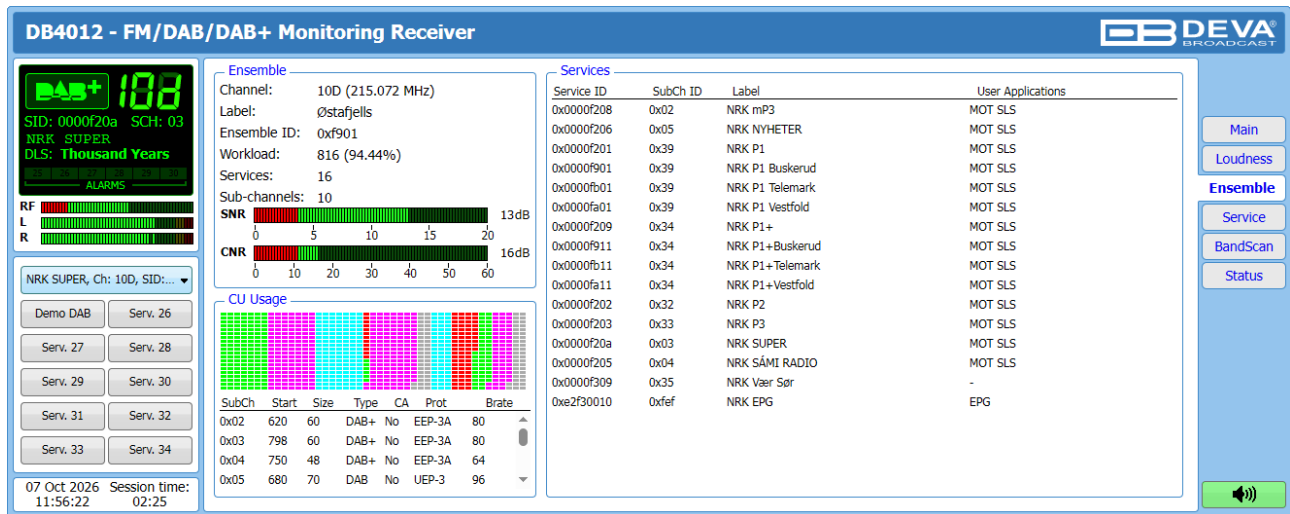
The page offers all the above measurements in two display forms – high refresh rate bar graphs for displaying current values and a time graph for extended visualization over time.

The user can modify the processing and appearance of the measurement using the following settings:

- **Long-term** – allows the user to select the length of the Long-term loudness measurement sliding time window. The time-based sliding window could be set with length from 10 to 120 seconds;
- **[Reset Long-term]** – resets the Long-term measurement;
- **Mode** – allows the user to select/change between [ITU BS.1770-4] and [EBU R128] mode;
- **Span** – sets the time graph span. Options of [60 seconds] and [120 seconds] are available;
- **Range** – the option buttons allow the user to set the preferred time graph measurement range.

IMPORTANT NOTE: Depending on the currently opened screen, the Loudness meter incorporated in the DB4012 switches between FM and DAB/DAB+.

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.

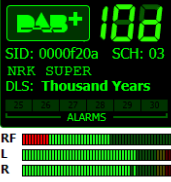
Services

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

SERVICE

DB4012 - FM/DAB/DAB+ Monitoring Receiver





SID: 0000f20a SCH: 03

NRK SUPER

DLS: Thousand Years

ALARMS

RF

L

R

NRK SUPER, Ch: 10D, SID:...

Demo DAB

Serv. 26

Serv. 27

Serv. 28

Serv. 29

Serv. 30

Serv. 31

Serv. 32

Serv. 33

Serv. 34

07 Oct 2026

Session time:

11:56:22

02:25

Service

DLS: God morgen!: God kveld!

Label: NRK SUPER

CU Start: 798

CU Count: 60

CU Level: 60

PTY: Children's Progs

Prot. Info: EEP-3A

DAB Mode: DAB+

DAB TM: MSC Stream Audio

Audio Mode: HE-AAC

Audio SRate: 48 kHz

Serv. Mode: DAB+

SID: 0xf20a

SubCh ID: 0x03

SubCh BitRate: 80 kbps

Audio Chan: Stereo

Audio BitRate: 48 kbps

Slideshow



Main

Loudness

Ensemble

Service

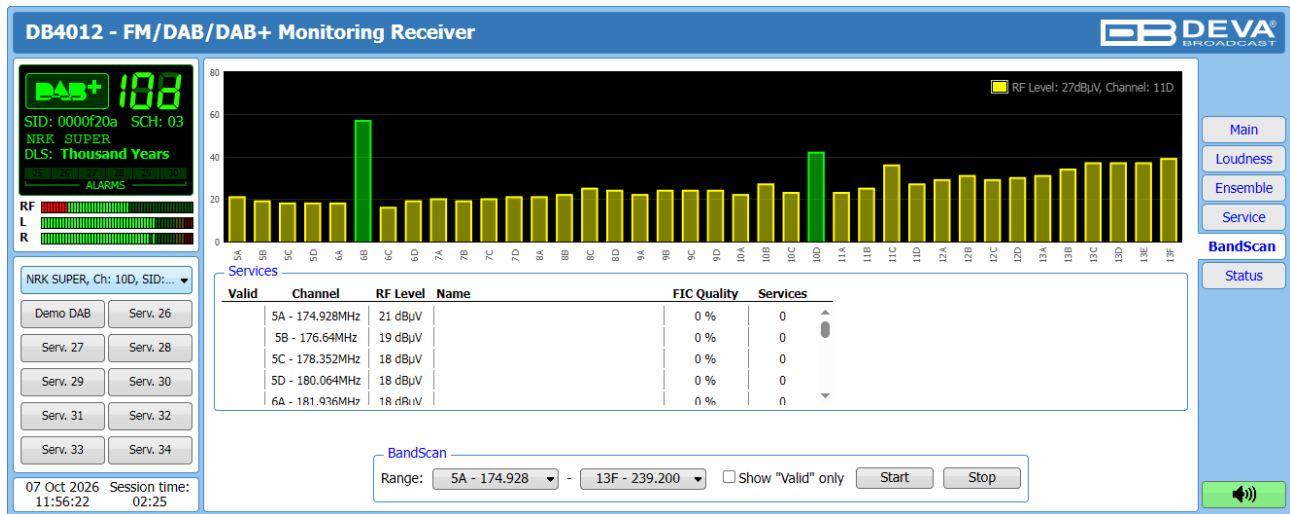
BandScan

Status



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

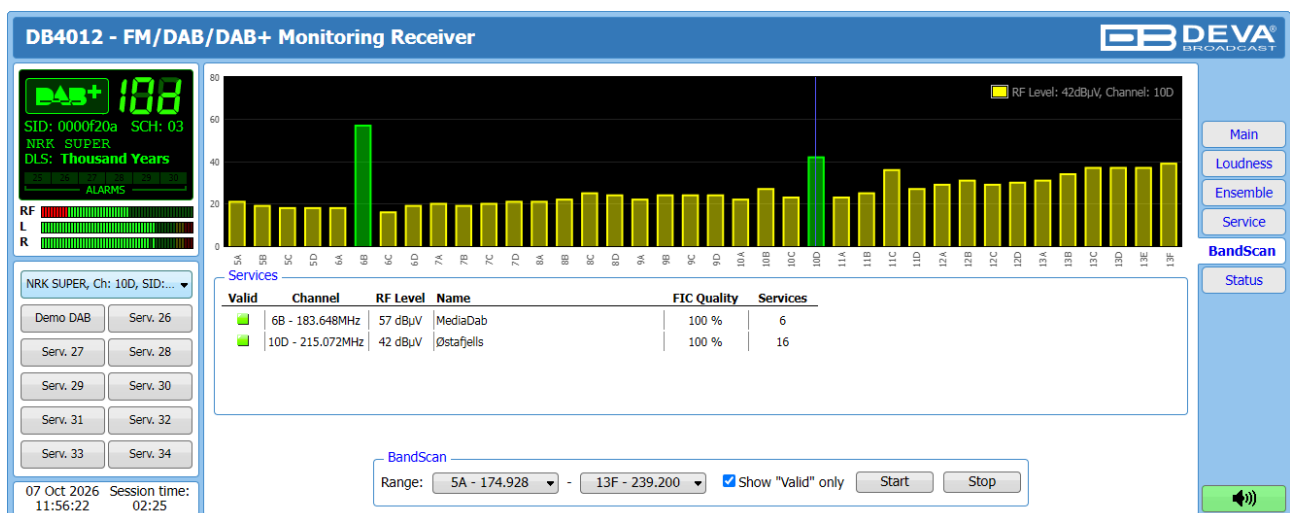
BANDSCAN



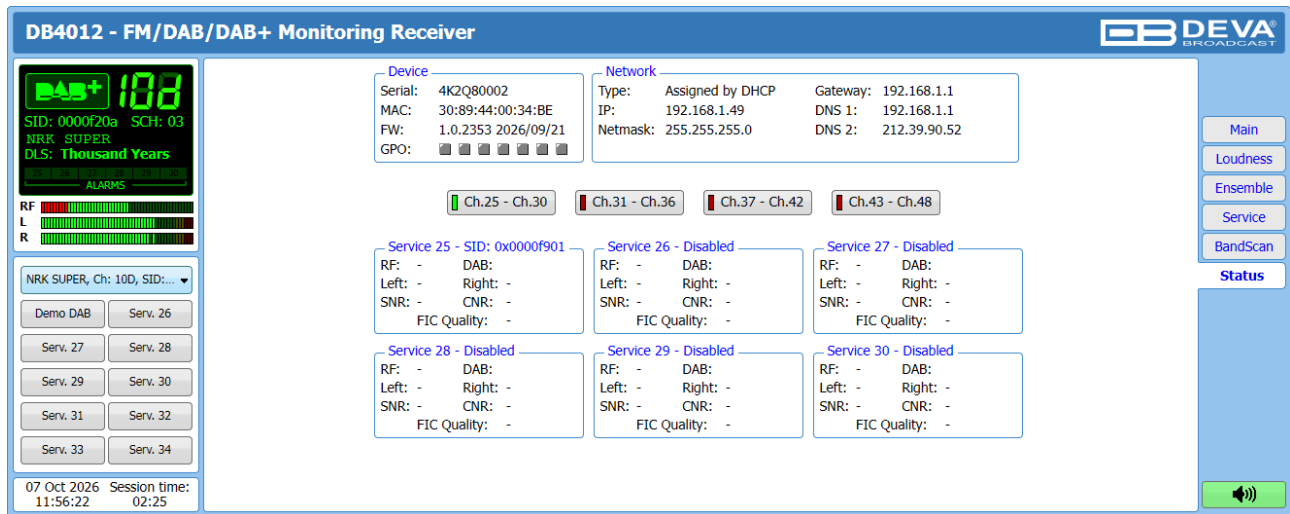
The bandscanning mode is easily customized by setting range of the scan. To start a bandscan follow the instructions listed below:

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.



STATUS



This Screen shows the alarm status of each parameter of the preset frequencies, along with the basic device and network status (IP address, MAC, etc.).

The Service parameters (RF, SNR, CNR etc.) have several conditions:

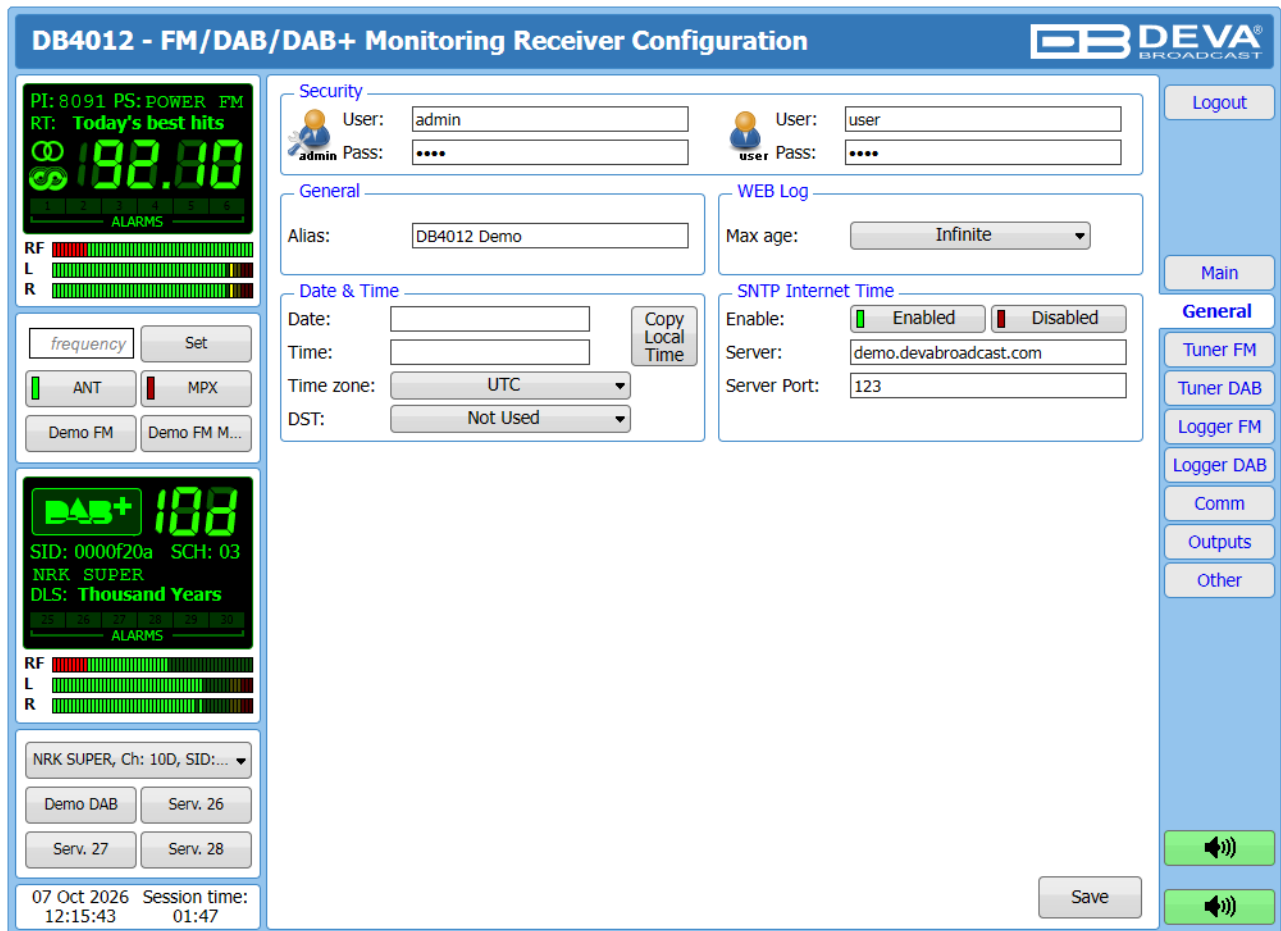
- In range – green OK;
- Out of range – red LOW, HIGH or LOSS;
- Signal monitoring is not enabled – n/a.

Web Interface Common Pages

Please bear in mind that the settings for both the FM and DAB/DAB+ options of the DB4012 are available through the Settings button located in the FM Section (upper part of the WEB Interface).



GENERAL SETTINGS



DB4012 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 DB4012 to be enhanced, a new **username** and **password** could 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.

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.

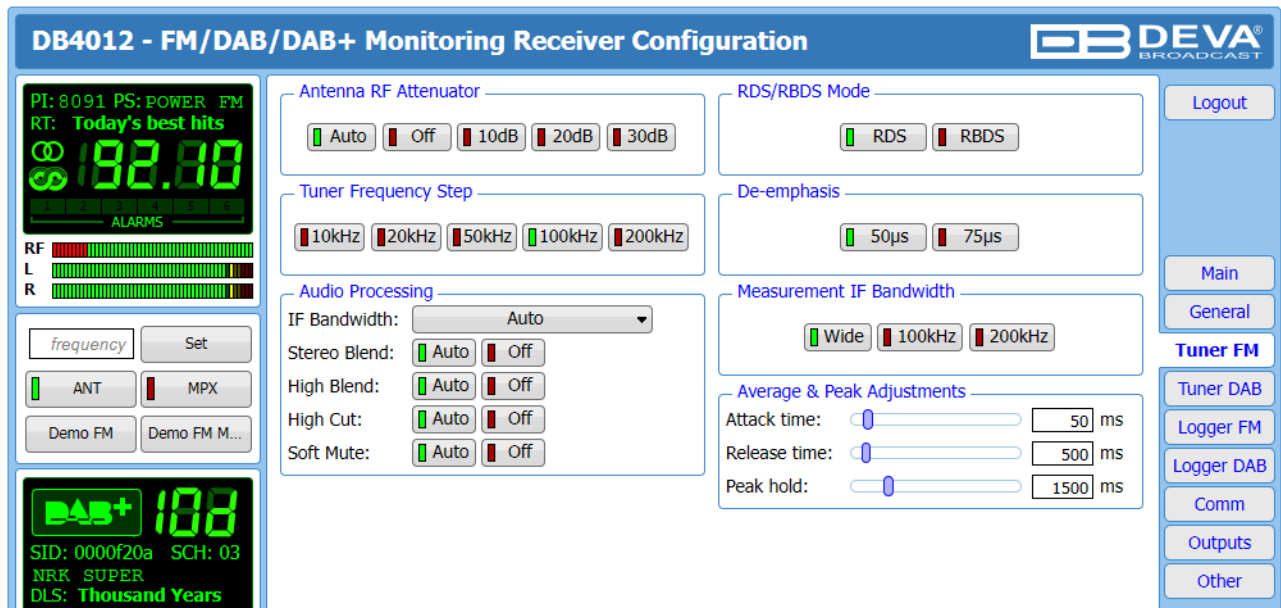
Date & Time – used for manually set the current Date and Time. [Copy Local Time] button will set the Date and Time to correspond to that of your computer.

SNTP Internet Time – Synchronizes automatically the DB4012 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.

On the bottom right corner you will find 2 speaker buttons. One for the currently tuned FM and one for the DAB signals.

TUNER FM SETTINGS



DB4012 - FM/DAB/DAB+ Monitoring Receiver Configuration

Antenna RF Attenuator
☒ Auto ☐ Off ☐ 10dB ☐ 20dB ☐ 30dB

Tuner Frequency Step
☐ 10kHz ☐ 20kHz ☐ 50kHz ☒ 100kHz ☐ 200kHz

Audio Processing
 IF Bandwidth:
 Stereo Blend: ☒ Auto ☐ Off
 High Blend: ☒ Auto ☐ Off
 High Cut: ☒ Auto ☐ Off
 Soft Mute: ☒ Auto ☐ Off

RDS/RBDS Mode
☒ RDS ☐ RBDS

De-emphasis
☒ 50µs ☐ 75µs

Measurement IF Bandwidth
☒ Wide ☐ 100kHz ☐ 200kHz

Average & Peak Adjustments
 Attack time: ms
 Release time: ms
 Peak hold: ms

Navigation Buttons: Logout, Main, General, Tuner FM, Tuner DAB, Logger FM, Logger DAB, Comm, Outputs, Other

The Tuner FM Section gives full control over FM Tuner settings.

Antenna 1 Mode – Allows attenuator mode depending on the location of the device to be selected. It is possible to choose the preset attenuation value or Auto - device will automatically choose the proper set-up.

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.

TUNER DAB SETTINGS

DB4012 - FM/DAB/DAB+ Monitoring Receiver Configuration


PI: 8091 PS: POWER FM
 RT: Today's best hits
182.80
 ALARMS

RF
 L
 R

frequency Set

ANT
 MPX

Demo FM

Demo FM M...


102
 SID: 0000f20a SCH: 03
 NRK SUPER
 DLS: Thousand Years
 ALARMS

RF
 L
 R

NRK SUPER, Ch: 10D, SID:...

Demo DAB

Serv. 26

Serv. 27

Serv. 28

07 Oct 2026 Session time:
 12:15:43 01:47

DAB Channel
 5A: 5A - 174.928MHz
 5B: 5B - 176.640MHz
 5C: 5C - 178.352MHz
 5D: 5D - 180.064MHz

DAB Channel
 6A: 6A - 181.936MHz
 6B: 6B - 183.648MHz
 6C: 6C - 185.360MHz
 6D: 6D - 187.072MHz

DAB Channel
 7A: 7A - 188.928MHz
 7B: 7B - 190.640MHz
 7C: 7C - 192.352MHz
 7D: 7D - 194.064MHz

DAB Channel
 8A: 8A - 195.936MHz
 8B: 8B - 197.648MHz
 8C: 8C - 199.360MHz
 8D: 8D - 201.072MHz

DAB Channel
 9A: 9A - 202.928MHz
 9B: 9B - 204.640MHz
 9C: 9C - 206.352MHz
 9D: 9D - 208.064MHz

DAB Channel
 10A: 10A - 209.936MHz
 10B: 10B - 211.648MHz
 10C: 10C - 213.360MHz
 10D: 10D - 215.072MHz

DAB Channel
 11A: 11A - 216.928MHz
 11B: 11B - 218.640MHz
 11C: 11C - 220.352MHz
 11D: 11D - 222.064MHz

DAB Channel
 12A: 12A - 223.936MHz
 12B: 12B - 225.648MHz
 12C: 12C - 227.360MHz
 12D: 12D - 229.072MHz

DAB Channel
 13A: 13A - 230.784MHz
 13B: 13B - 232.496MHz
 13C: 13C - 234.208MHz
 13D: 13D - 235.776MHz
 13E: 13E - 237.488MHz
 13F: 13F - 239.200MHz

Available Services

Service	Channel	SID	SubCh ID
☐ DECIBEL RANDSTAD	12C	0x000086F0	0x05
☐ GrootNieuwsRadio	12C	0x00008960	0x01
☐ KBC	12C	0x00008999	0x04
☒ L1 Radio	12C	0x0000841D	0x07

Save

Logout

Main

General

Tuner FM

Tuner DAB

Logger FM

Logger DAB

Comm

Outputs

Other

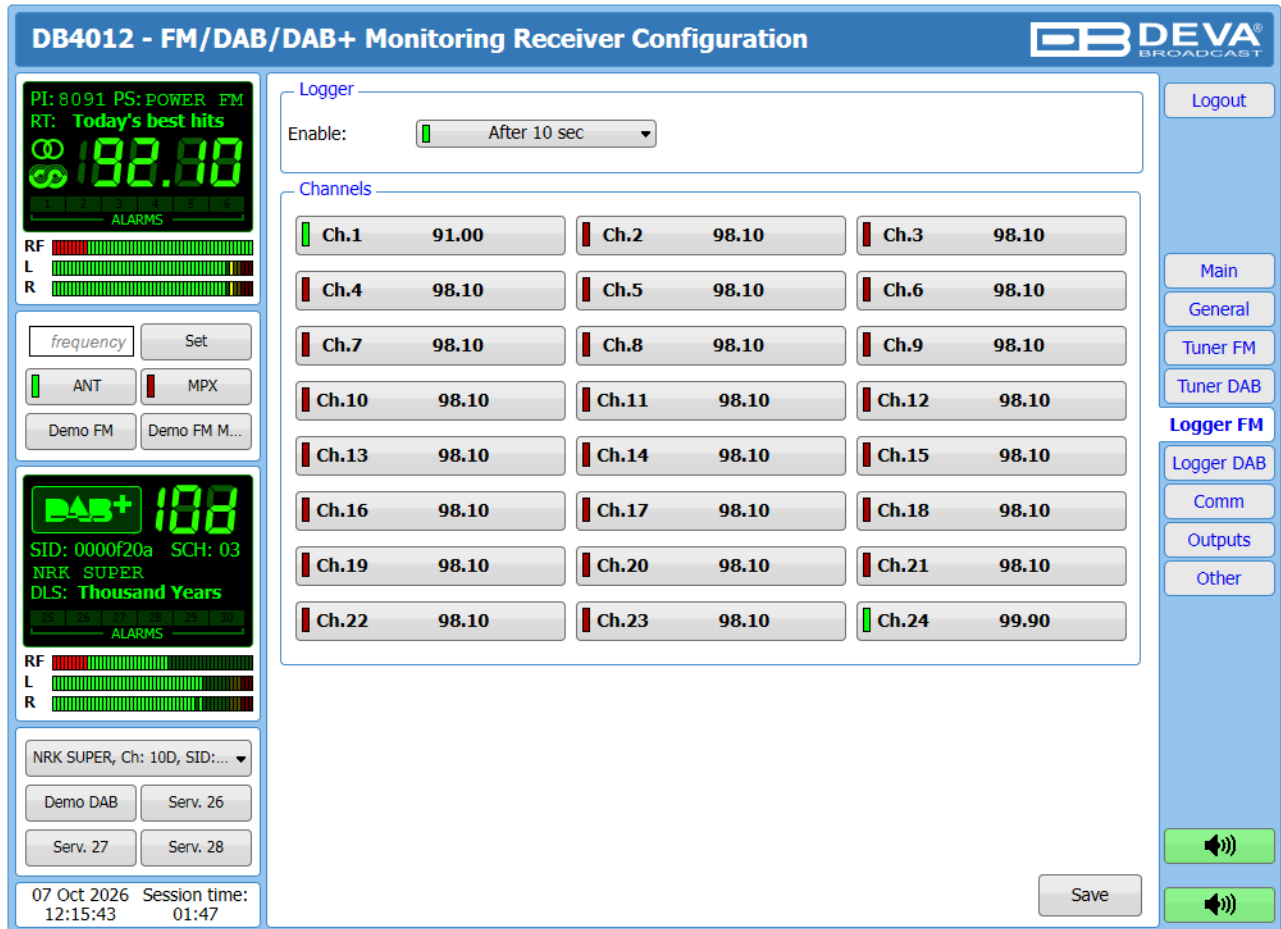




The Tuner DAB Section gives control over DAB Tuner settings, allowing you to select a DAB channel and service. All available services will be listed below once the list is collected from the multiplex data.

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LOGGER FM



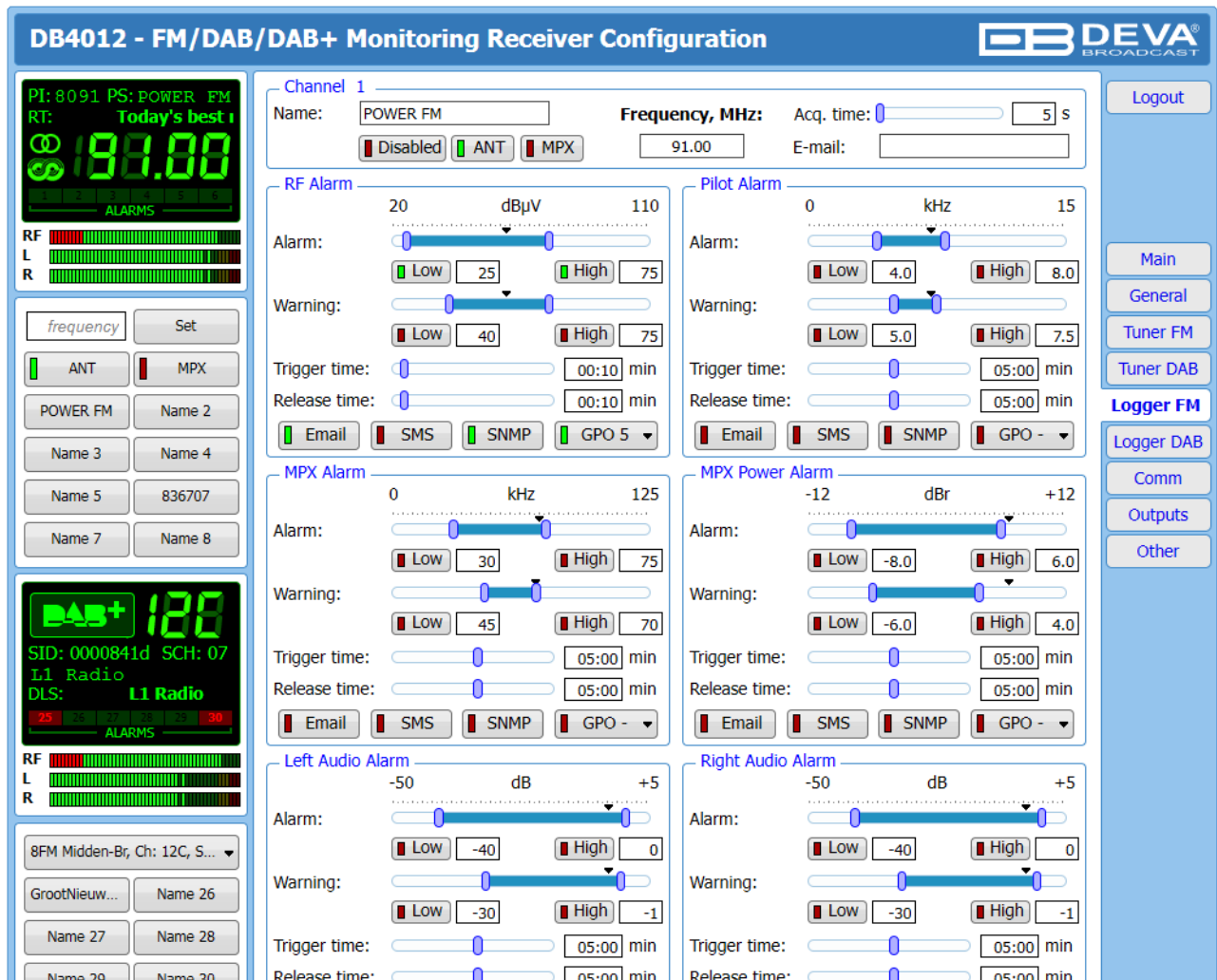
Trough this section of the WEB Interface, FM Channels could be chosen and monitored, by applying the needed settings.

When the desired adjustments are being made, DB4012 will monitor all of the selected channels at regular intervals. All of the collected information is accessible through the built-in FTP Server. ([see "Download files via FTP" on page 92](#))

Follow the steps below to initiate the simplified process of starting a Logger mode:

- Set the Logger's start time delay;
- Click on a Channel to open the settings page;
- Set the Name and Frequency parameters for each of the channels;
- Set the Acquisition time for each service;
- In order for a service to be included in the campaign, the [Enable]/[Disable] button should be selected. To exclude a Channel from the campaign select the [Disable] button.

FM CHANNELS SETTINGS (CHANNELS 1 TO 24)



The DB4012 can monitor up to 24 FM Stations at regular intervals and send warning and alarm notifications via E-mail, SMS, SNMP and GPO. Every Channel consists of a group of settings (explained in details below), which are used when monitoring and alerting. Each preset has its own page where it is being configured. Measurement windows can be set for each of the parameters: RF, Left and Right audio levels. Trigger and alarm release times can be set for each alarm.

The notification means (Email, SMS, SNMP, GPO) is set for each parameter individually. To enable the notification, press on the relevant button so that it could be illuminated in green.

Channel

- [Disabled] / [ANT] / [MPX] – Select the input source: Antenna or MPX. If the channel is not enabled by selecting ANT or MPX, its frequency will not be monitored and no alarm notifications will be generated. Selecting Disabled completely disables monitoring for the channel;
- Frequency – specify the frequency to be monitored;
- Name – channel alias. The same name will appear on the quick access buttons in the “dashboard”;
- Acquisition time – specify the observation time for the current station (before switching to the next channel).
- E-mail – set email address that will receive warning and alarm notifications for this service only.

Alarm

- Alarm Range – interactive slider used to adjust the Low & High thresholds at which an alarm will be generated;
- Warning Range – interactive slider 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;
- RDS/RBDS Group Alarm – alarm only for selected groups will be generated.

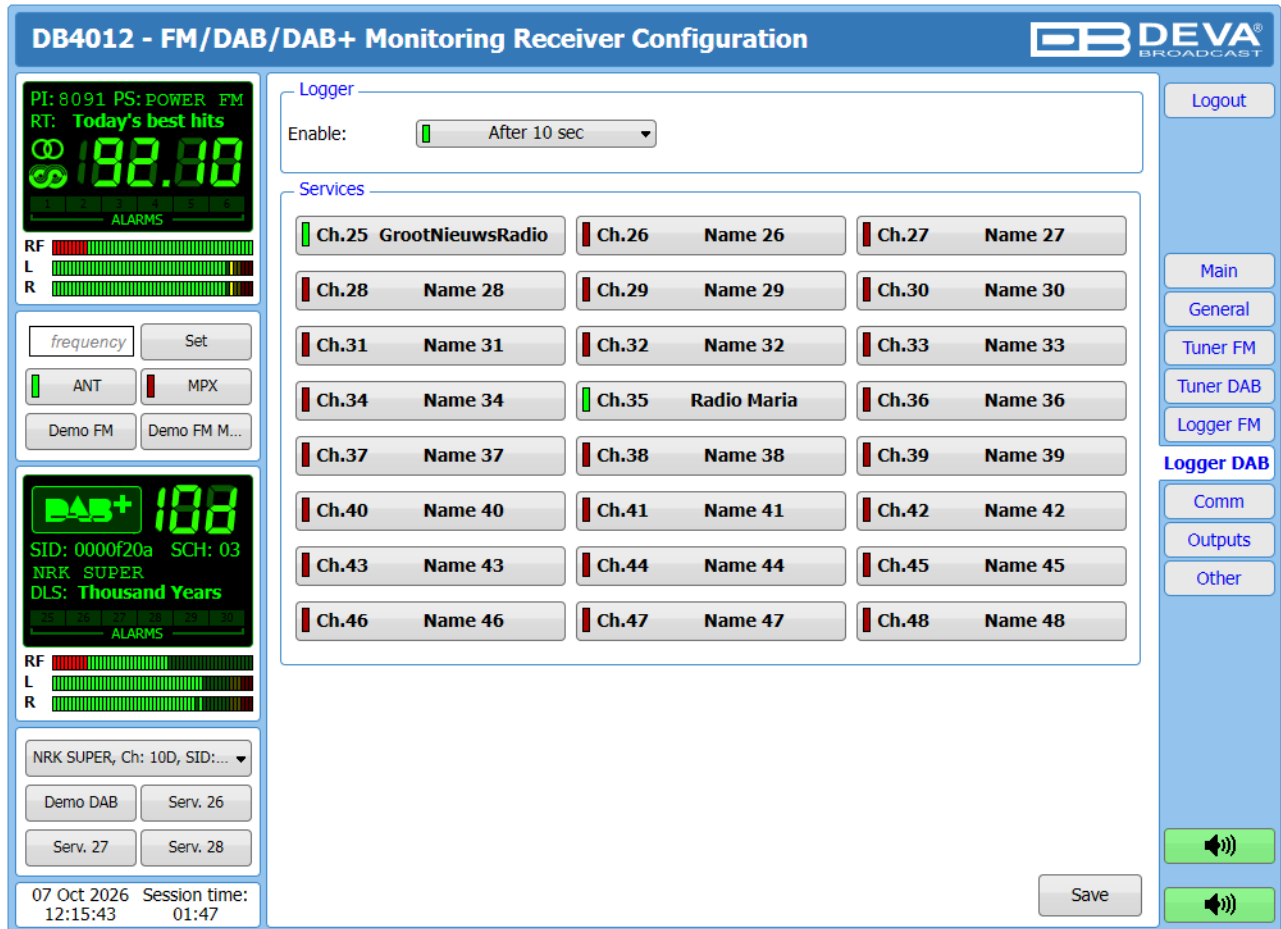
IMPORTANT NOTE: Warnings and alarms are generated only when the Logger mode is running. While there is any user interaction, warning or alarm will not be generated and send. The Logger starts running once the user logs out of the WEB interface.

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.

LOGGER DAB



DB4012 - FM/DAB/DAB+ Monitoring Receiver Configuration

Logger

Enable: ☒ After 10 sec

Services

Ch.25 GrootNieuwsRadio	Ch.26 Name 26	Ch.27 Name 27
Ch.28 Name 28	Ch.29 Name 29	Ch.30 Name 30
Ch.31 Name 31	Ch.32 Name 32	Ch.33 Name 33
Ch.34 Name 34	Ch.35 Radio Maria	Ch.36 Name 36
Ch.37 Name 37	Ch.38 Name 38	Ch.39 Name 39
Ch.40 Name 40	Ch.41 Name 41	Ch.42 Name 42
Ch.43 Name 43	Ch.44 Name 44	Ch.45 Name 45
Ch.46 Name 46	Ch.47 Name 47	Ch.48 Name 48

07 Oct 2026 Session time: 12:15:43 01:47

Save

Trough this section of the WEB Interface, services could be chosen and monitored, by applying the needed settings.

When the desired adjustments are being made, DB4012 will monitor all of the selected services at regular intervals. All of the collected information is accessible through the built-in FTP Server. ([see "Download files via FTP" on page 92](#))

Follow the steps below to initiate the simplified process of starting a Logger mode:

- Set the Logger's start time delay;
- Click on a service to open the settings page;
- Set the Channel and Service ID parameters for each of the channels;
- Set the Acquisition time for each service;
- In order for a service to be included in the campaign, the [Enable]/[Disable] button should be selected. To exclude a station from the campaign select the [Disable] button.

DAB LOGGER SERVICE SETTINGS (SERVICE 1)

DB4012 - FM/DAB/DAB+ Monitoring Receiver Configuration

PI: 8091 PS: POWER FM
RT: r's best music
188.00

RF

L

R

frequency

Set

ANT

MPX

POWER FM

Name 2

Name 3

Name 4

Name 5

836707

Name 7

Name 8

120

SID: 0000841d SCH: 07

L1 Radio

DLS:

L1 Rad

RF

L

R

L1 Radio, Ch: 12C, SID: 0x...

▼

GrootNieuw...

Name 26

Name 27

Name 28

Name 29

Name 30

Name 31

Name 32

Service 35
Logout

Name: Radio Maria
12C - 227.360
0x00008816
Acq. time: 0 5 s

☐ Disabled ☒ Enabled
12C - 227.360
Radio Maria, Ch:
E-mail:

RF Alarm

0

dBuV

70

Alarm:

Low 15

High 59

Warning:

Low 36

High 49

Trigger time: 00:10 min
Release time: 00:10 min

☒ Email

☒ SMS

☒ SNMP

☒ GPO 3

DAB Loss Alarm

No Signal

OK

Alarm:

Enabled

Disabled

Trigger time: 05:00 min
Release time: 05:00 min

☐ Email

☐ SMS

☐ SNMP

☐ GPO -

DAB SNR Alarm

0

dB

20

Alarm:

Low 5

High 20

Warning:

Low 5

High 15

Trigger time: 05:00 min
Release time: 05:00 min

☐ Email

☐ SMS

☐ SNMP

☐ GPO -

DAB CNR Alarm

0

dB

54

Alarm:

Low 10

High 54

Warning:

Low 15

High 50

Trigger time: 05:00 min
Release time: 05:00 min

☐ Email

☐ SMS

☐ SNMP

☐ GPO -

Left Audio Alarm

-50

dB

+5

Alarm:

Low -40

High 0

Warning:

Low -30

High -1

Trigger time: 05:00 min
Release time: 05:00 min

☐ Email

☐ SMS

☐ SNMP

☐ GPO -

Right Audio Alarm

-50

dB

+5

Alarm:

Low -40

High 0

Warning:

Low -30

High -1

Trigger time: 05:00 min
Release time: 05:00 min

☐ Email

☐ SMS

☐ SNMP

☐ GPO -

FIC Quality Alarm

0

%

100

Alarm:

Low 50

High 100

Warning:

Low 60

High 100

Trigger time: 05:00 min
Release time: 05:00 min

☐ Email

☐ SMS

☐ SNMP

☐ GPO -

07 Oct 2026 Session time: 13:20:05

Export Import

Save

Main

General

Tuner FM

Tuner DAB

Logger FM

Logger DAB

Comm

Outputs

Other

The DB4012 can monitor up to 24 preset DAB Services at regular intervals and send alarm notification via E-mail, SMS, SNMP and GPO. Every Channel consists of a group of settings (explained in details below), which are used when monitoring and alerting. Each preset has its own page where it is being configured. Measurement windows can be set for each of the six parameters: RF, Left and Right audio levels, DAB Loss, DAB SNR, DAB CNR, FIC quality. Trigger and alarm release times can be set for each alarm.

The notification means (Email, SMS, SNMP, GPO) is set for each parameter individually. To enable the notification, press on the relevant button so that it could be illuminated in green.

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Service

- Name – preset alias. The same name will appear on the quick access buttons in the “dashboard”;
- [Enabled]/[Disabled] channel monitoring and sending of warnings and alarms. If the channel is not generally enabled, the frequency will not be monitored and alarm notifications will not be received;
- Channel - select the desired DAB Channel from the drop-down menu;
- Service – select the desired Service from the drop-down menu;
- Acquisition time – specify the observation time for the current station (before switching to the next channel);
- E-mail – set email address that will receive alarm notifications for this service only.

Alarm

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

IMPORTANT NOTE: Warnings and Alarms are generated only when the Logger mode is running. While there is any user interaction, alarm will not be generated and send. The Logger starts running once the user logs out of the WEB interface.

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.

[Export] will export the currently applied alarms settings.

[Import] allows you to import the Service settings from other DB4012.

COMMUNICATION SETTINGS

DB4012 - FM/DAB/DAB+ Monitoring Receiver Configuration



PI: 8091 PS: POWER FM
 RT: Today's best hits
102.10
 ALARMS

RF
 L
 R

frequency Set

ANT

MPX

Demo FM

Demo FM M...

Ch. 3

Ch. 4

Ch. 5

Ch. 6

Ch. 7

Ch. 8


102.1
 SID: 0000f20a SCH: 03
 NRK SUPER
 DLS: Gode historier
 ALARMS

RF
 L
 R

NRK mP3, Ch: 10D, SID: 0...

Demo DAB

Serv. 26

Serv. 27

Serv. 28

Serv. 29

Serv. 30

Serv. 31

Serv. 32

Network

Enable: ☒ Enabled ☐ Disabled

DHCP: ☒ Enabled ☐ Disabled

IP Address: 010.138.102.016

Netmask: 255.255.255.000

Gateway: 010.138.102.001

Primary DNS: 192.168.001.001

Sec. DNS: 192.168.001.001

GSM Modem

Number 1:

Number 2:

Number 3:

Number 4:

Number 5:

Baudrate: 9600

Modem Type: Generic

Test

HTTP Server

Enable: ☒ Enabled ☐ Disabled

Server Port: 80

Session time: 03:00 min

Application Server

Enable: ☒ Enabled ☐ Disabled

Server Port: 4924

Session time: 03:00 min

FTP Server

Enable: ☒ Enabled ☐ Disabled

Cmd Port: 4921

Data Port: 4920

Audio Stream Server

Enable: ☐ FM ☐ DAB ☐ Disabled

Server Port: 5000

Quality: 128 kbps

SNMP Agent

Agent: ☒ Enabled ☐ Disabled

Agent Port: 4961

Agent ses. time: 03:00 min

Agent ID: 0

Read Community: DEVA4012

Write Community: DEVA4012

Manager IP: 192.168.001.001

Manager Port: 162

SNMP MIB File: Download

Test

E-mail

Enable: ☒ SMTP ☐ DEVA ☐ Disabled

E-mail 1:

E-mail 2:

Sender:

Username:

Password:

Host name: DB4012_SMTP_CLIENT

Connection: Regular

Server:

Server Port: 25

Test

UECP UDP Relay

Enable: ☒ Enabled ☐ Disabled

Server:

Server Port: 5001

Syslog

Enable: ☒ Enabled ☐ Disabled

Server:

Server Port: 514

UECP TCP Server

Enable: ☒ Enabled ☐ Disabled

Server Port: 2048

USB Port

Enable: ☒ Enabled ☐ Disabled

07 Oct 2026 Session time:
 13:26:01 01:17

▲ - These settings require reboot.

Save Save & Reboot

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, DB4012 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.

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FTP Server

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

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 DB4012 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.

UECP Relay

The unit can relay the received RDS as a UECP stream. There are two possible options:

Option 1 – via UDP, where the device sends the received RDS as UECP encoded UDP packets unconditionally to the specified IP Address and Port. The receiver could be an RDS/RBDS Encoder SmartGen, other RDS Encoder, or Monitoring Software.

Option 2 – via TCP. The unit has built in server and a Monitoring Software to receive the UECP encoded RDS data could be connected to the unit.

GSM Modem

Up to five numbers for SMS control and alarm notifications could be set. Baud Rate is mandatory for the proper operation of the GSM Modem.

We recommend that a test SMS to be generated (via pressing the 'Test' button), once all needed settings are applied. Upon success, the SMS will be delivered to all the specified GSM numbers.

Example of Test SMS Message:

DB4012 Test Message.

NOTE: The current condition of the GSM Modem could be checked in the "Status Screen".

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.

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:

DB4012 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:

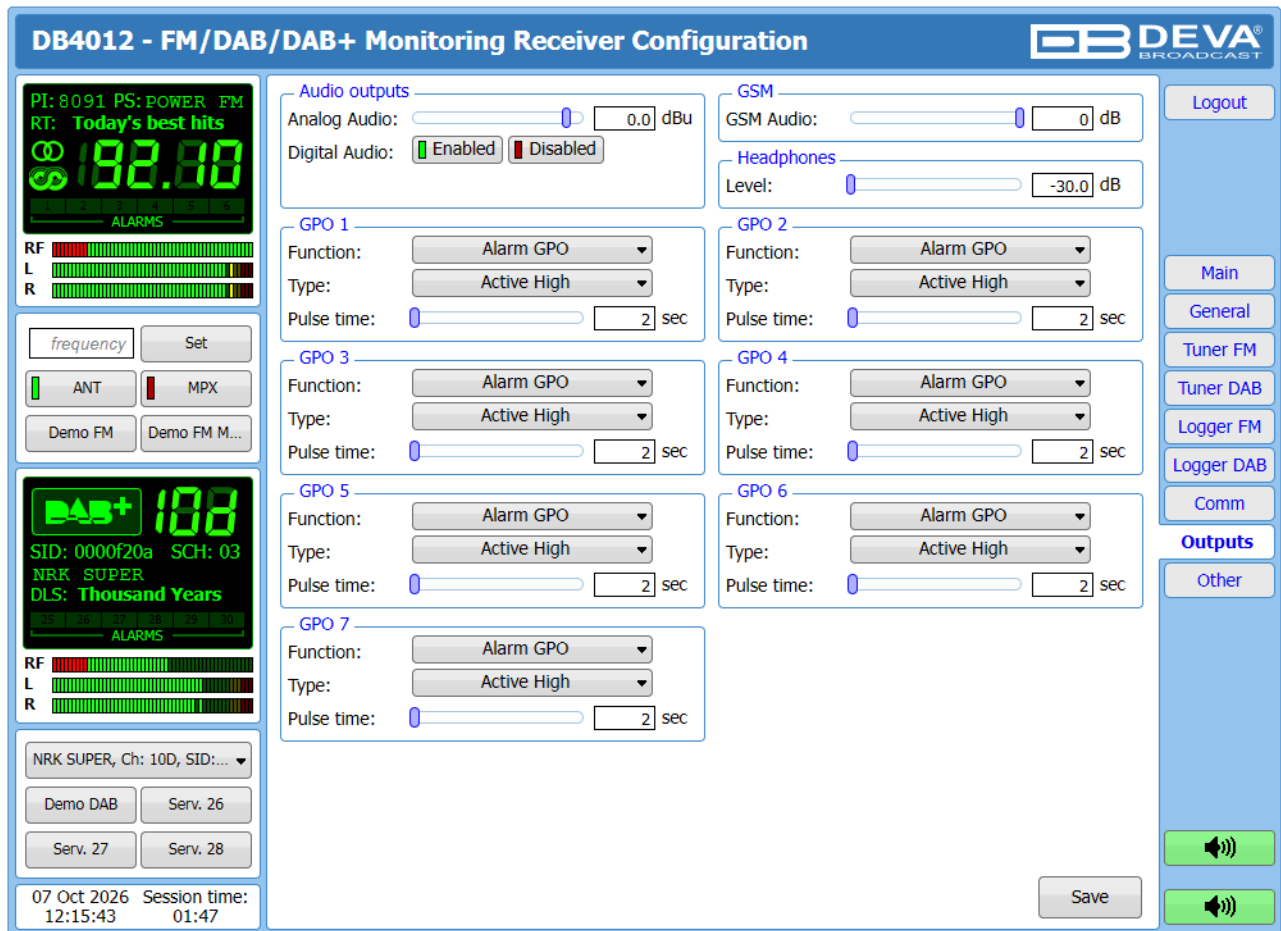
DB4012 Test Message.

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



DB4012 - FM/DAB/DAB+ Monitoring Receiver Configuration

Audio outputs
 Analog Audio: dBu
 Digital Audio: ☒ Enabled ☐ Disabled

GSM
 GSM Audio: dB

Headphones
 Level: dB

GPO 1
 Function:
 Type:
 Pulse time: sec

GPO 2
 Function:
 Type:
 Pulse time: sec

GPO 3
 Function:
 Type:
 Pulse time: sec

GPO 4
 Function:
 Type:
 Pulse time: sec

GPO 5
 Function:
 Type:
 Pulse time: sec

GPO 6
 Function:
 Type:
 Pulse time: sec

GPO 7
 Function:
 Type:
 Pulse time: sec

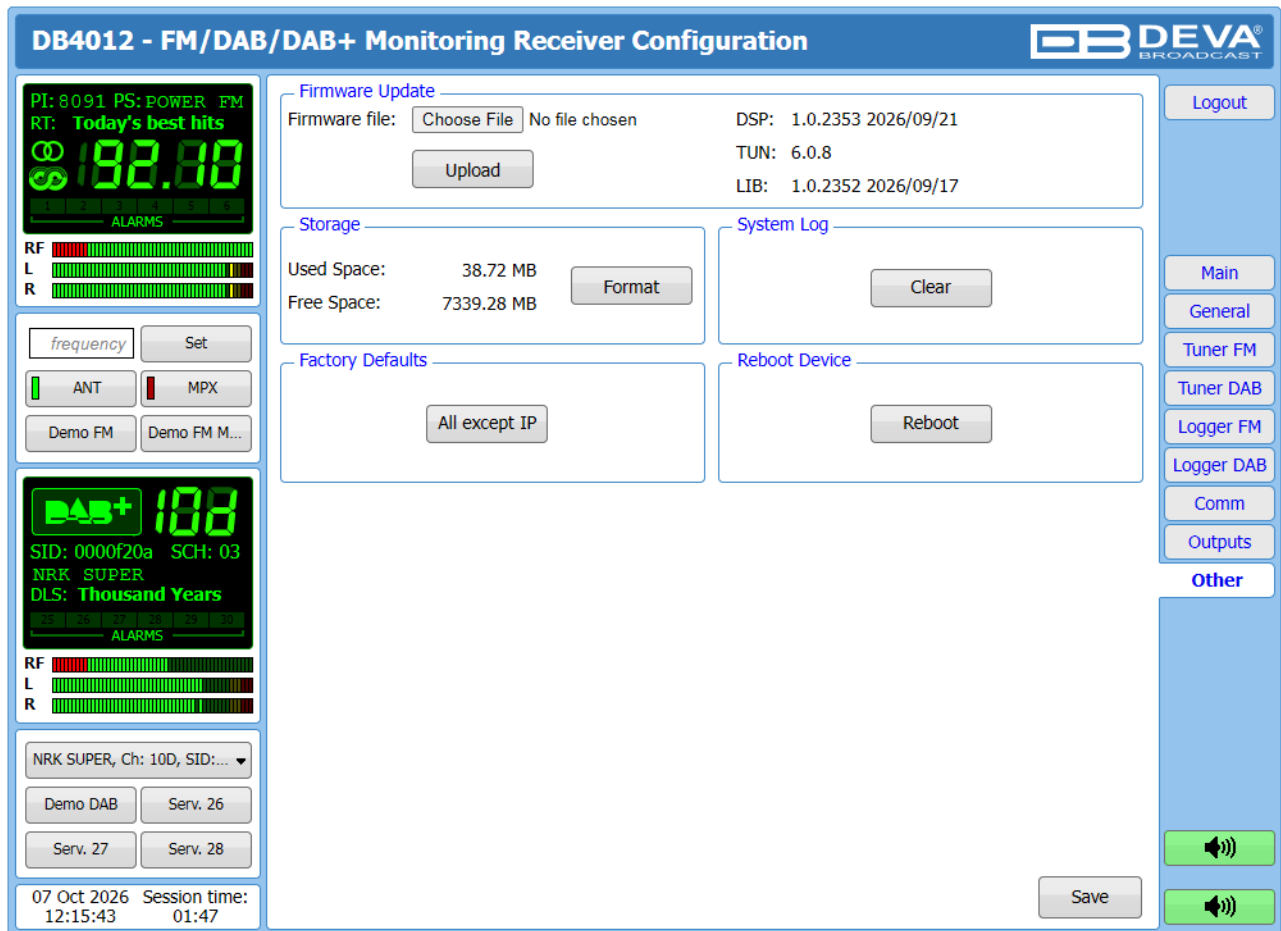
Save

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 SETTINGS



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 DB4012 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 DB4012, 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 DB4012, it is assumed that the user is familiar with the RDS concept.

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.

APPENDIX B.2

PTY Code Description Used in RDS Mode – Europe, Asia

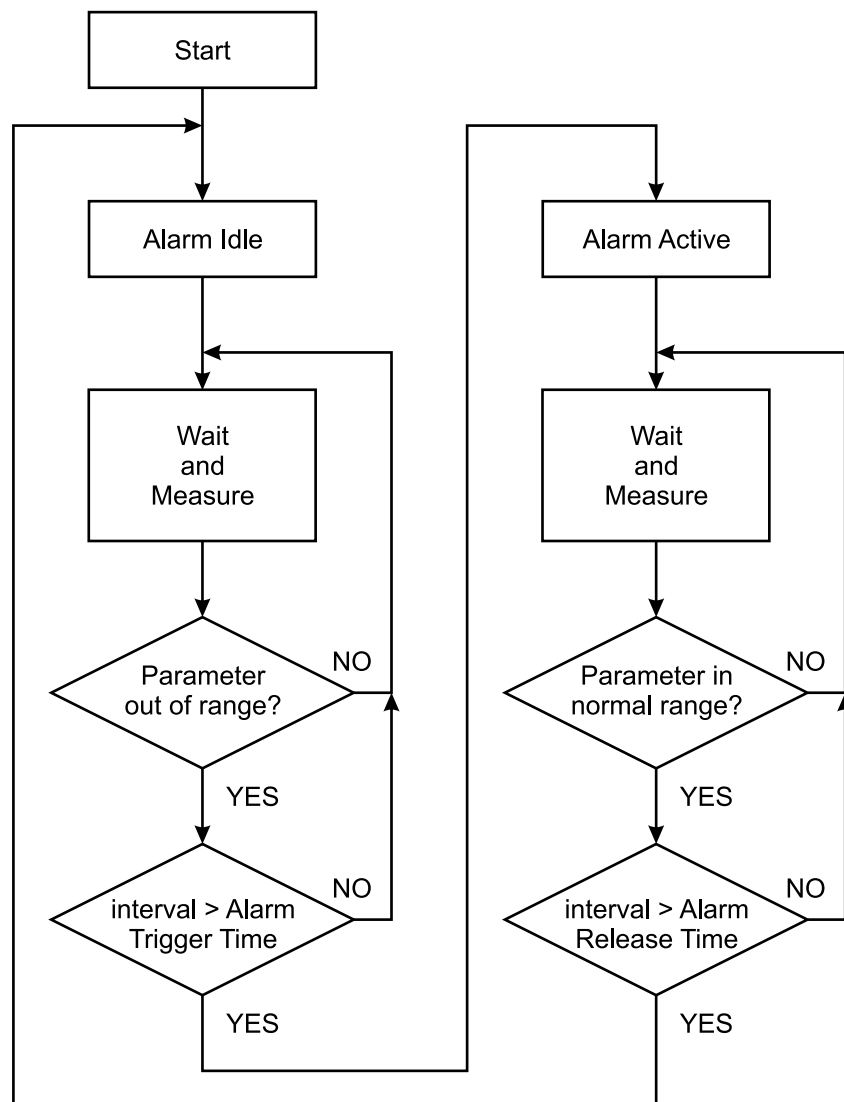
PTY	Short Name	Description
1	News	Short accounts of facts, events and publicly expressed views, reportage and actuality.
2	Current affairs	Topical program expanding or enlarging upon the news, generally in different presentation style or concept, including debate, or analysis.
3	Information	Program the 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

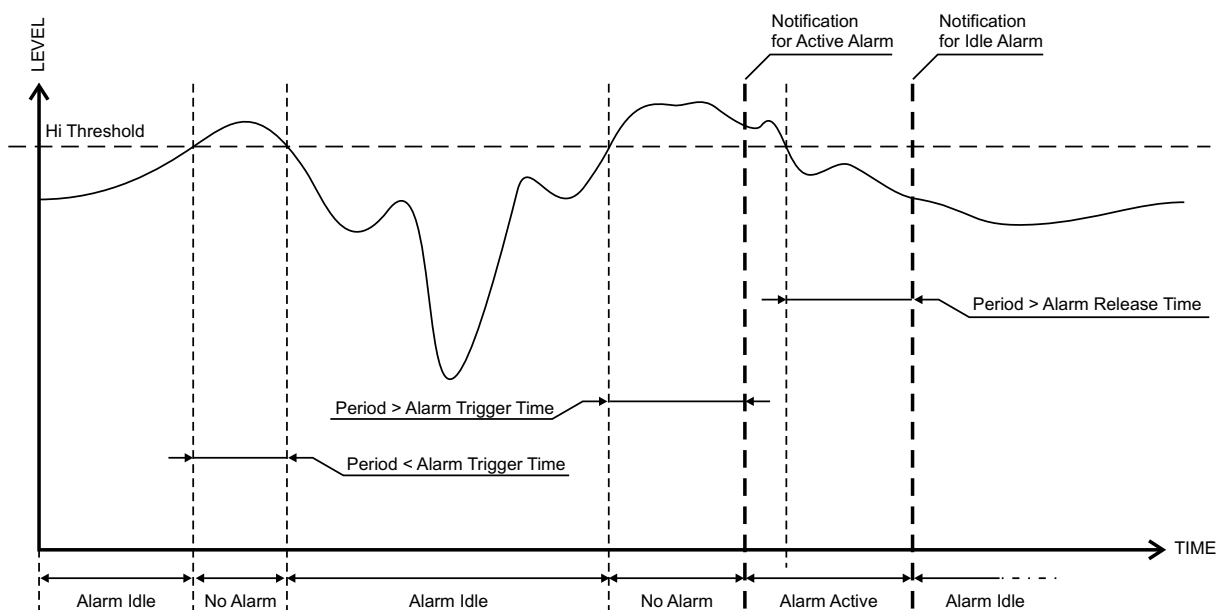
After collecting all the data, the DSP-based core compares the values measured with the predefined by the user threshold levels, for all the alarms monitored. In case that a parameter is beyond limits, the device will initiate the sending of an alarm notification via the selected communication path. 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, DAB, DAB SNR, DAB CNR, Left/Right, FIC Quality, RDS Group loss. 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.



If the RDS Group has not been received within the Alarm Trigger Time, the state would be changed into Active. If the Active state and the Release Time have elapsed and the RDS Group is received, the state is changed to Idle. Should the RDS Group is received before the Release Time is elapsed, the state would remain Active.

IMPORTANT NOTE: When in Logger Mode, the alarm notification works as follows: if the observation time is set to 10 seconds, and during this time the RF level (for example) is below the specified threshold, but the timeout has not expired, an alarm will be generated upon the channel's next time slot if the level is still below the specified threshold and the timeout expires.

ALARM NOTIFICATIONS

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

Example for E-mal Notification:

Date: 04 Nov 2013, 07:31:11

DB4012 reports ACTIVE alarm on 91.10MHz - Power FM (CH1)

Alarm: RDS > 6.5kHz

Signal parameters:

RF: 51.5dBuV

Pilot: 7.5kHz

RDS: 11.4kHz

Left: -7.2dB

Right: -8.2dB

Example for SMS Notification:

ACTIVE ALARM:CH#2

27.09.2013 09:08:34

FREQ:95.7MHz

RF:35.0dBuV *L*

Left:-2.8dB

Right:-3.1dB

Pilot:7.92kHz

RDS:4.12kHz

NOTE: *L* for 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

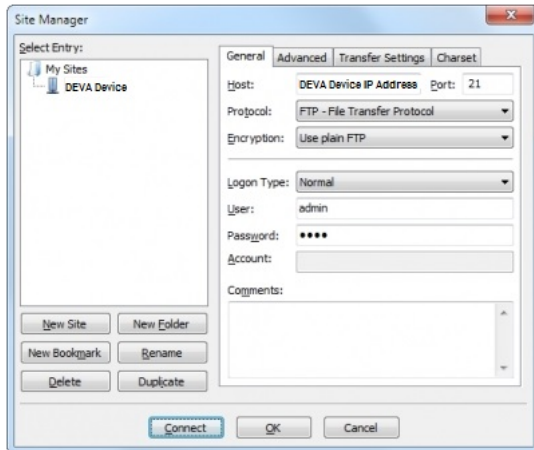
If the connection to the device is made through a Network address translation (NAT) router or firewall, the port forwarding feature of the router should be configured. The port forwarding is usually set in the firewall section of the router's menu. As each router has different port forwarding procedure, 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.

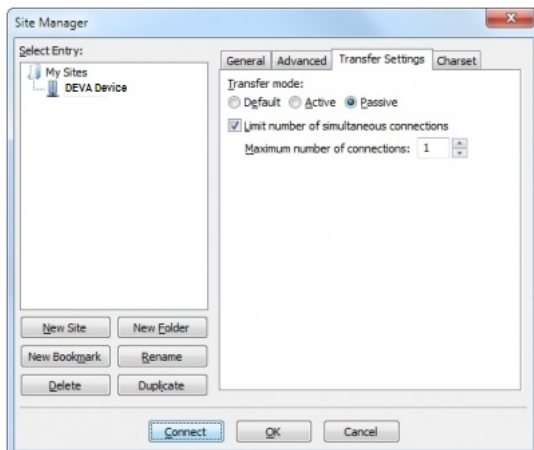
3. Example of FTP Client (FileZilla) Settings

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

GSM MODEM OPTION - FEATURES AND USAGE

The described Features and Usage of the GSM Option is compatible with following DEVA Units:

- **DB44** – Compact FM Radio Monitoring Receiver
- **DB45** – DSP-Based FM Radio Receiver and Modulation Analyzer
- **DB4004** – DSP-based FM Radio Monitoring Receiver
- **DB4005** – SDR-Based FM Radio Modulation Analyzer and Monitoring Receiver
- **DB7000** – FM Radio Re-Broadcast Receiver with Built-in IP Audio & MP3 Backup Players
- **DB7001** – DSP-based FM Radio Re-Broadcast Receiver with TCP/IP Connectivity
- **DB7007** – Advanced FM Radio Re-Broadcast Receiver with IP Audio & MP3 Backup Players
- **DB4402-V2** – High-Performance Dual FM Monitoring Receiver & Radio Streamer
- **DB4012** - Professional FM/DAB/DAB+ Monitoring Receiver

The DEVA FM Monitoring receivers supports a very wide range of GSM Modems. However, we suggest the usage of the following model - Sierra Wireless AirLink. This is the modem that is provided from DEVA Broadcast if the feature has been ordered along with the DEVA Unit.

The GSM modem model is directly PIN to PIN compatible with the DEVA Unit GSM Modem's connector, and by simply using a direct cable, you will have not any troubles with the data communication and audio insertion.

Before connecting the GSM Modem to the DEVA Unit, it is necessary to set up the parameters for normal operation. Please bear in mind that:

- GSM modem does not have an automatic detection of the baud rate (AUTOBAUD function). The most important thing is to set up the GSM Modem communication settings. The Communication speed must be 9600 bps, Data Bits: 8; Parity: None; Stop Bits:1.
- The SIM Card PIN code must be disabled in order to avoid a configuration problem of the modem. We suggest you to do this procedure using a GSM phone device of choice. This will save you a lot of time for reading the GSM Modem documentation. In case you decide to do that using the GSM Modem please refer to its User Manual for details.

IMPORTANT: Once the GSM modem is properly installed, the DEVA Unit must be pre-configured to receive messages from up to 5 authorized numbers. This can be made via the WEB interface of the DEVA Unit. Upon successful installation, a notification message will appear on the unit's LCD/OLED screen (if such is available). Using this screen you can find the best place with good GSM Network coverage for the installation of the GSM modem.

NOTE: For information, how the DEVA Unit can be accessed via the WEB Interface, please refer to the respective quick user guide for the device in question. All the documents are available at www.devabroadcast.com/downloads

SHORT MESSAGE SERVICES AVAILABLE



- By sending, a message with the command `Listen` + the desired station (for example `"Listen 101.80"`), the DEVA Unit will retrieve you a call with short record of the station that you have required.

- If you need the current information for a particular station, you can use the second command – `Status` + the desired station (for example `"Status 101.80"`). Then DEVA Unit will send you a message like the one depicted on the screen.

- The ALARM Dispatch - This is a notification that the DEVA Unit will send to you in the cases when a parameters drops below or exceeds the pre-defined threshold. In case of ALARM, the unit will send SMS to all authorized GSM numbers.

Bellow you will find examples how to use the DEVA Unit with GSM Modem features:

REMOTE AUDIO LISTENING

Type the following text and send it as SMS to the DEVA Unit's GSM number:

`Listen FFF.FF`

`FFF.FF` is the frequency to listen to.

Upon receiving your 'Listen' request via SMS, the DEVA Unit will call you back and when you take the call will hear the audio on the frequency `FFF.FF`

IMPORTANT: Do not include leading zeroes such as `"Listen 089.90"`
Fill with trailing zeroes up to two digits after decimal symbol.
Decimal symbol must be `'.'` (not comma `','`).
For example: `"Listen 104.50"` or `"Listen 91.55"`.

REMOTE STATUS REQUEST

The DEVA Unit can send you a report with the values of the most important FM Parameters like RF level, MPX Level, Pilot Level, RDS Level, L&R Audio Level, Stereo/Mono Status and RDS PI Code at any time. Upon receiving your request via SMS, the unit's tuner will be adjusted on the requested frequency and will make measurement of all the parameters listed above. Once the procedure is completed, an SMS message will be generated and sent to the requestor's GSM. Command Example:

Status FFF.FF

FFF.FF is frequency to Tune.

IMPORTANT: Do not include leading zeroes such as "Status 089.90"

Fill with trailing zeroes up to two digits after decimal symbol.

Decimal symbol must be '.' (not comma ',')

For example: "Status 102.55" or "Status 88.80".

The DEVA Units will shortly respond back with SMS with the following content (example):

STATUS:
11.07.09 09:08:34
FREQ:102.50MHz
RF Level: 55.1dBuV
MPX Level: 74.1kHz
Left: -11.7dB
Right: -12.3dB
Pilot: 7.5kHz
Stereo
RDS Level: 4.1kHz
PI:824D

INITIALIZATION PROCEDURE FOR SIERRA WIRELESS AIR-LINK FXT009 GSM MODEM

in regards with the following DEVA Units:

- **DB44** – Compact FM Radio Monitoring Receiver
- **DB45** – DSP-Based FM Radio Receiver and Modulation Analyzer
- **DB4004** – DSP-based FM Radio Monitoring Receiver
- **DB4005** – SDR-Based FM Radio Modulation Analyzer and Monitoring Receiver
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- **DB7007** – Advanced FM Radio Re-Broadcast Receiver with IP Audio & MP3 Backup Players
- **DB4402-V2** – High-Performance Dual FM Monitoring Receiver & Radio Streamer
- **DB4012** - Professional FM/DAB/DAB+ Monitoring Receiver

1. Setting up the modem

Prior to connecting/using the GSM modem for the first time, kindly read the manufacturer's user manual. The document can be found on https://source.sierrawireless.com/resources/airlink/hardware_reference_docs/airlink_fxt_series_user_guide/

The appropriate values should be assigned via the RS232 interface of the GSM modem. A custom made cable and a terminal program of any kind should be used. The cable specifications should be as follows:

To PC DB 9 female pin		GSM modem DB 15 male pin	Note
1	→	1	Data Carrier Detect
2	→	6	com TX
3	→	2	com RX
4	→	8	DTR
5	→	9	GND
6	→	7	DSR
7	→	12	RTS
8	→	11	CTS
9	→	13	RI

Next, the following settings should be applied to the terminal program:

Speed	115200 bps.
Flow control	hardware (CTS/RTS)
Parity	none
Data bits	8
Stop bits	1

To check the communication type the command "AT" in the terminal program and press Enter. The modem will/should respond with "OK".

Upon powering on, the modem should start working with its factory settings. To see these settings type the command “AT&V”. The modem will respond with the factory default settings:

```
Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008
+CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1
+SPEAKER:1 +ECHO:0 &C:0 &D:2 %C:0
+IPR:115200 +ICF:3,4 +IFC:2,2
```

ATTENTION: If the displayed parameters differ from one listed above, we recommend you to return the modem to its factory defaults. In order for this to happen, the command “AT&F1” should be typed.

NOTE: For further information on the AT commands, please refer to the GSM Modem complete user manual.

Once the modem is returned to its factory defaults, you can proceed with following commands:

COMMAND	DESCRIPTION	NOTE
ATE0	This command will turn Echo Off	
AT+ICF=3,4	8n1, no parity	
AT+IFC=0,0	no flow control	
AT+IPR=9600	set com speed	Change terminal speed to 9600 bps (if needed)
AT&W	save configuration	After this command turn power Off and On
AT&V	display new configuration	

NOTE: After every command, the modem should respond with “OK”.

Once all changes/modifications are applied, the modem should respond with the following adjustments:

```
Q:0 V:1 S0:000 S2:043 S3:013 S4:010 S5:008
+CR:0 +CRC:0 +CMEE:0 +CBST:0,0,1
+SPEAKER:1 +ECHO:0 &C:1 &D:2 %C:0
+IPR:9600 +ICF:3,4 +IFC:0,0
```

Upon applying all the described settings, the modem should be fully compatible for operation with DEVA Unit.

2. Connecting with DEVA Unit

Communication Cable Description:

DEVA Unit port DB 15 female pin		GSM modem DB 15 male pin	Note
2	→	2	com TX
4	→	4	mic (+)
5	→	5	mic (-)
6	→	6	com RX
9	→	9	gnd

APPENDIX F

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.

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.

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.