

MAINTENANCE AND OPERATION  
INSTRUCTION MANUAL

# DB4402-V2

High-Performance Dual  
FM Monitoring Receiver & Radio Streamer



# Contents

<b>Introduction.....</b>	<b>5</b>
<b>Typographic conventions .....</b>	<b>6</b>
<b>General Information.....</b>	<b>7</b>
<b>Product Features.....</b>	<b>8</b>
<i>Technical Specifications .....</i>	<i>9</i>
<b>Factory Default Settings.....</b>	<b>11</b>
<i>Monitoring Receiver.....</i>	<i>11</i>
<i>Network Settings.....</i>	<i>11</i>
<i>WEB Server .....</i>	<i>11</i>
<i>E-mail .....</i>	<i>11</i>
<i>Audio.....</i>	<i>11</i>
<i>GSM Modem.....</i>	<i>11</i>
<i>SNMP Settings.....</i>	<i>12</i>
<i>Management Settings.....</i>	<i>12</i>
<i>Channel Presets Default Settings .....</i>	<i>13</i>
<i>Audio Streamer.....</i>	<i>14</i>
<i>Network Settings.....</i>	<i>14</i>
<i>WEB Server .....</i>	<i>14</i>
<i>Audio.....</i>	<i>14</i>
<i>GSM Modem.....</i>	<i>14</i>
<i>SNMP Settings.....</i>	<i>14</i>
<i>Management Settings.....</i>	<i>15</i>
<b>Safety Precautions.....</b>	<b>16</b>
<b>Panel Indicators and Appointments .....</b>	<b>17</b>
<i>Front View .....</i>	<i>17</i>
<i>Rear View .....</i>	<i>18</i>
<i>GPO Connector Pinouts .....</i>	<i>19</i>
<i>Electrical Characteristics of GPO .....</i>	<i>19</i>
<b>Getting Started .....</b>	<b>20</b>
<i>Connection .....</i>	<i>20</i>
<i>Network Settings.....</i>	<i>21</i>
<i>Network Discovery.....</i>	<i>21</i>
<i>Login .....</i>	<i>22</i>
<b>WEB Interface FM Monitoring Receiver .....</b>	<b>23</b>
<i>Device Control Interface.....</i>	<i>23</i>
<i>Main .....</i>	<i>24</i>
<i>MPX.....</i>	<i>25</i>
<i>Loudness.....</i>	<i>26</i>
<i>FM Graph.....</i>	<i>27</i>
<i>RDS/RBDS.....</i>	<i>28</i>
<i>FFT.....</i>	<i>31</i>
<i>Scope .....</i>	<i>32</i>
<i>Bandscan .....</i>	<i>33</i>
<i>Status .....</i>	<i>34</i>
<i>LOG.....</i>	<i>35</i>

<i>General Settings</i> .....	36
<i>Tuner Settings</i> .....	37
<i>Channels Settings (Channels 1 to 6)</i> .....	38
<i>Communication Settings</i> .....	40
<i>Outputs Settings</i> .....	42
<i>Other Settings</i> .....	43
<b>WEB Interface FM Radio Streamer</b> .....	<b>44</b>
<i>Device Control Interface</i> .....	44
<i>Main</i> .....	45
<i>RDS/RBDS</i> .....	46
<i>Bandscan</i> .....	49
<i>Status</i> .....	50
<i>LOG</i> .....	51
<i>General Settings</i> .....	52
<i>Tuner Settings</i> .....	53
<i>Channels Settings (Channels 1 to 6)</i> .....	54
<i>Communication Settings</i> .....	55
<i>Outputs Settings</i> .....	57
<i>Other Settings</i> .....	58
<b>APPENDIX A</b> .....	<b>59</b>
<i>Alarm Triggers</i> .....	59
<i>Alarm Notifications</i> .....	61
<b>APPENDIX B</b> .....	<b>62</b>
<i>GSM Modem Option - Features and Usage</i> .....	62
<i>Short message services available</i> .....	63
<i>Remote Audio Listening</i> .....	63
<i>Remote Status Request</i> .....	64
<i>Initialization procedure for Sierra Wireless AirLink FXT009 GSM modem</i> .....	65
1. <i>Setting up the modem</i> .....	65
2. <i>Connecting with DEVA Unit</i> .....	67
<b>APPENDIX C</b> .....	<b>68</b>
<i>How should I configure the connection between my DEVA Device and an FTP Client?</i> .....	68
<b>WARRANTY TERMS AND CONDITIONS</b> .....	<b>70</b>
<b>Product Registration Card</b> .....	<b>71</b>

THIS PAGE  
IS INTENTIONALLY  
LEFT BLANK

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

## General Information

The DB4402-V2 – Dual FM Monitoring Receiver is a superb and highly practical combination between a logger and a streamer which allows you to easily and accurately monitor and store all important parameters of the FM signal while simultaneously giving you the opportunity to listen to a constant, uninterrupted audio stream. The synchronized performance of both major functions is at the core of the idea for this model, as well as the unit's major asset. You can listen to the selected audio feed at the same time as the logger campaign is running. The design of this device relies on simplicity coupled with functionality to offer customers the opportunity of a single solution to both tasks.

Providing the stable, dependable operation characterizing all DEVA products, the DB4402-V2 is fully DSP-based, with a built-in oscilloscope and an RDS/RBDS decoder with a BER meter. It also permits users to set alarms for RF, MPX, Pilot and RDS signal via email, SMS or SNMP. What is more, the TCP/IP and GSM connectivity provides easy remote control, monitoring and listening to the radio signal from any location.

The device offers a “Restore Factory Defaults” option and easy update of the firmware. It is an advanced solution giving customers a number of advantages and top all-round, multi-faceted performance as both a monitoring tool and a streaming device.

## Product Features

- Fully DSP based core
- Built-in Oscilloscope allowing Left, Right and MPX display
- MPX Power measurement with data history
- Loudness meter
- RF Spectrum analyzer allowing to check the RF Carrier parameters
- MPX Spectrum analyzer for Left, Right and MPX measurements
- Selectable De-emphasis – 50 $\mu$ s and 75 $\mu$ s
- Built-in Stereo Decoder; Stereo Presence Detection
- Date & Time Settings with various formats
- LAN port for full TCP/IP remote control and monitoring
- Up to 90dB $\mu$ V direct RF Antenna Input
- Adjustable alarms for RF, Deviation, Pilot and RDS signal
- Firmware update for future-proof operation
- Parameters Factory Restore Option
- FM Band 87 - 108 MHz Basic Spectrum Analyzer
- MPX, PILOT & RDS deviation meters
- LEFT and RIGHT demodulated audio level meters
- Headphones audio output
- RDS and RBDS decoder with BER meter
- Intuitive Application Interface
- Alarm dispatch via E-mail, SMS, SNMP
- Channel status reporting via SMS
- RF and RDS Measurements
- Remote Listening via optional GSM modem
- Real Time Audio Program Streaming
- Attractive price and very good price-performance ratio
- Very Intuitive Embedded WEB server for interactive supervision
- Proved and reliable hardware for 24/7/365 operating
- Easy Installation and Setup
- SNTP for automatic synchronization of the built-in clock
- Compact and Robust Aluminum Case for high RF immunity

## TECHNICAL SPECIFICATIONS

RF INPUT	
Tuning Range	User selectable, 87.1-107.9 MHz (CCIR), 65-74 MHz (OIRT), 76-95 MHz (Japan)
Tuning Step	10, 20, 50, 100 kHz
Tuner Sensitivity	30 dB $\mu$ V
Antenna Port	BNC Connector, 50 $\Omega$
Internal Attenuator	0, 10, 20 and 30 dB
Dynamic range	100 dB
FM DEMOD	
IF Filter Bandwidth	15 Increments (25kHz - 157kHz, Auto)
Frequency Response	$\pm 0.1$ dB, 10 Hz to 86 kHz
Dynamic range	90 dB
STEREO DECODER	
Frequency Response (L and R)	$\pm 0.1$ dB, 10 Hz to 15 kHz
SNR (Stereo)	60 dB, 50 $\mu$ s de-emphasis
THD	0.1%, 10 Hz to 15 kHz, 50 $\mu$ s de-emphasis
Separation	50 dB, 50 Hz to 10 kHz, 50 $\mu$ s de-emphasis
Crosstalk	52 dB
RDS DECODER	
Standards	European RDS CENELEC; United States RBDS NRSC
Error Correction & Counting	Yes
AF Decoding	Yes
CT (Time/Date)	Yes
PI, PTY, DI, MS	Yes
TA/TP	Yes
RT (Radio Text), RT+	Yes
PS (Program Service name)	Yes
ODA	Yes
Group Analyzer	Yes
BER Analyzer	Yes
METERING ACCURACY	
RF Level	$\pm 1$ dB, 0 to 100 dB $\mu$ V
Multipath	0 to 100%; accuracy - $\pm 1\%$
MPX Deviation	$\pm 2$ kHz, 10 to 100 kHz, 1 kHz resolution
MPX Power	$\pm 12$ dBr; resolution - 0.1dBr, 10 sec. integration; accuracy - $\pm 0.2$ dBr
Pilot Level	$\pm 0.5$ kHz, 1 to 12 kHz, 0.2 kHz resolution
RDS Level	$\pm 0.5$ kHz, 1 to 12 kHz, 0.2 kHz resolution
Audio Level	$\pm 1$ dB, +10.0 to -55.0 dB, 0.1 dB resolution

<b>FFT SPECTRUM ANALYSIS</b>	
Input	Composite MPX, Audio
Dynamic Range	80 dB
FFT Length	1024
Sampling Rate	256 kHz - Composite, 64 kHz - Audio
<b>SCOPE ANALYSIS</b>	
Input	Composite MPX, Audio
Trigger Mode	Auto, Fall
Dynamic Range	±120 kHz
Sampling Rate	256 kHz - Composite, 64 kHz - Audio
<b>USER INTERFACE</b>	
Web interface	Full monitoring and control; Interactive and easy to use
Indicators	6 LEDs (on front panel)
Headphone Output	1/8" (3.5mm) phone jack (on front panel)
<b>OPERATING CONDITIONS</b>	
Temperature	10° to 60°C
EMC Immunity	6V/m
<b>OUTPUTS</b>	
Audio stream	Icecast/Shoutcast compatible audio stream
Alarms	E-mail, SMS, SNMP
Headphone	1/8" (3.5mm) Phone Jack
GSM Modem	15-pin Male D-Sub Connector
<b>COMMUNICATION INTERFACES</b>	
Ethernet 10/100 Base-T	RJ45 Connector
GSM Modem	15 pin Male D-Sub Connector
<b>POWER SUPPLY</b>	
Voltage	100-240V / 50-60 Hz / 25W
Connector	IEC320
<b>SIZE AND WEIGHT</b>	
Dimensions (W;H;D)	485 x 44 x 300 mm
Shipping Weight	540 x 115 x 300 mm / 4.5kg

## Factory Default Settings

### MONITORING RECEIVER

#### Network Settings

IP	192.168.1.2
Gateway	192.168.1.1
Subnet Mask	255.255.255.0
DNS	192.168.1.1
DHCP	Enabled

#### WEB Server

HTTP Port		80
Admin	Username	user
	Password	pass
User	Username	user
	Password	pass

#### E-mail

E-mail 1	<i>blank</i>
E-mail 2	<i>blank</i>
Sender	<i>blank</i>
Server	<i>blank</i>
Port	25

#### Audio

Stream Port	5000
Name	DB4402-V2 - FM Radio Monitoring Tool
Quality	128 kbps

#### GSM Modem

Number 1	<i>blank</i>
Number 2	<i>blank</i>
Number 3	<i>blank</i>
Number 4	<i>blank</i>
Baudrate	9600

### SNMP Settings

Agent	Enabled
Agent ID	1
Agent Port	161
Read Community	DEVA4402
Write Community	DEVA4402
Manager IP	192.168.1.1
Manager Port	162

### Management Settings

Attenuator	Auto
De-emphasis	50 $\mu$ s
Internet Time	Enabled
Internet Time Server	pool.ntp.org
Internet Time Server Port	123
Time Zone	UTC (+00:00)
Web session timeout	3 minutes
SNMP session timeout	1 minute

### Channel Presets Default Settings

Parameter	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6
Scheduling	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled
Frequency	98 kHz	98 kHz	98 kHz	98 kHz	98 kHz	98 kHz
Alarms Control	All Disabled	All Disabled	All Disabled	All Disabled	All Disabled	All Disabled
Trigger Time	5 minutes	5 minutes	5 minutes	5 minutes	5 minutes	5 minutes
Release Time	5 minutes	5 minutes	5 minutes	5 minutes	5 minutes	5 minutes
RF Alarm Low Threshold	40 dB $\mu$ V	40 dB $\mu$ V	40 dB $\mu$ V	40 dB $\mu$ V	40 dB $\mu$ V	40 dB $\mu$ V
RF Alarm High Threshold	60 dB $\mu$ V	60 dB $\mu$ V	60 dB $\mu$ V	60 dB $\mu$ V	60 dB $\mu$ V	60 dB $\mu$ V
MPX Alarm Low Threshold	50 kHz	50 kHz	50 kHz	50 kHz	50 kHz	50 kHz
MPX Alarm High Threshold	90 kHz	90 kHz	90 kHz	90 kHz	90 kHz	90 kHz
MPX Power Alarm Low Threshold	-8 dBr	-8 dBr	-8 dBr	-8 dBr	-8 dBr	-8 dBr
MPX Power Alarm High Threshold	6 dBr	6 dBr	6 dBr	6 dBr	6 dBr	6 dBr
Left Alarm Low Threshold	-30 dB	-30 dB	-30 dB	-30 dB	-30 dB	-30 dB
Left Alarm High Threshold	3 dB	3 dB	3 dB	3 dB	3 dB	3 dB
Right Alarm Low Threshold	-30 dB	-30 dB	-30 dB	-30 dB	-30 dB	-30 dB
Right Alarm High Threshold	3 dB	3 dB	3 dB	3 dB	3 dB	3 dB
Pilot Alarm Low Threshold	5 kHz	5 kHz	5 kHz	5 kHz	5 kHz	5 kHz
Pilot Alarm High Threshold	9 kHz	9 kHz	9 kHz	9 kHz	9 kHz	9 kHz
RDS Alarm Low Threshold	2 kHz	2 kHz	2 kHz	2 kHz	2 kHz	2 kHz
RDS Alarm High Threshold	7 kHz	7 kHz	7 kHz	7 kHz	7 kHz	7 kHz
RDS Group Alarm	All Disabled	All Disabled	All Disabled	All Disabled	All Disabled	All Disabled

## AUDIO STREAMER

### Network Settings

IP	192.168.1.10
Gateway	192.168.1.1
Subnet Mask	255.255.255.0
DNS	192.168.1.1
DHCP	Enabled

### WEB Server

HTTP Port		80
Admin	Username	user
	Password	pass
User	Username	user
	Password	pass

### Audio

Stream Port	5000
Name	DB4402-V2 - FM Radio Streamer
Quality	128 kbps

### GSM Modem

Number 1	<i>blank</i>
Number 2	<i>blank</i>
Number 3	<i>blank</i>
Number 4	<i>blank</i>
Baudrate	9600

### SNMP Settings

Agent	Enabled
Agent ID	1
Agent Port	161
Read Community	DEVA4402
Write Community	DEVA4402
Manager IP	192.168.1.1
Manager Port	162

### Management Settings

Attenuator	Auto
De-emphasis	50 $\mu$ s
Internet Time	Enabled
Internet Time Server	pool.ntp.org
Internet Time Server Port	123
Time Zone	UTC (+00:00)
Web session timeout	3 minutes
SNMP session timeout	1 minute

## Safety Precautions

**IMPORTANT:** *Carefully read this paragraph as it contains important instructions concerning operator safety and directions regarding the installation, operation and maintenance of the equipment. Failure to observe the safety instructions and information given in this manual constitutes an infringement of the safety rules and design specifications provided for this piece of equipment. DEVA Broadcast Ltd. declines all responsibility if any one of the safety rules given herein is not observed. DEVA Broadcast Ltd. declines all responsibility if the end-user resells the product. The equipment is to be used by people capable of operating it in a trouble-free manner and it is assumed that they are aware of the following safety rules.*

- ◇ Keep this manual with the utmost care and close at hand so that it can be consulted whenever needed
- ◇ After unpacking the equipment, check its condition.
- ◇ Avoid banging the equipment.
- ◇ The packing material (plastic bags, polystyrene, nails, etc.) must never be left within reach of children, as these items are potential sources of danger.
- ◇ Do not use the equipment in places where the temperature is not within the recommended range, as specified by the manufacturer.
- ◇ Before connecting the equipment, make sure the nameplate specifications correspond to the mains electricity supply (the nameplate is located on the equipment enclosure).
- ◇ Do not remove the sticker from the equipment as it contains important specifications and the relevant serial number.
- ◇ To join the equipment to the mains supply, use the power cord purchased with the equipment.
- ◇ The equipment must be used only for the purposes it was designed for.
- ◇ Abuse or misuse of the equipment is extremely dangerous for people, pets and property. The manufacturer declines all responsibility for damage and injury resulting from improper use and mishandling.
- ◇ Certain basic safety rules must be observed when using electrical equipment, in particular:
  - Never touch the equipment with wet and/or damp hands or other parts of the body.
  - Keep the equipment away from drops of water or sprinkling systems.
  - Never use the equipment near high heat sources or explosive material.
  - Do not introduce any extraneous matter into the equipment.
  - Do not allow children or untrained people to use the equipment.
- ◇ Before cleaning or servicing the equipment outside, disconnect its power supply and wait at least 2 seconds before working on it, as recommended by current safety regulations.
- ◇ In the event of faults and/or improper operation, turn off the equipment, shut off the electrical power and call your dealer.
- ◇ Do not attempt to make repairs and/or adjustments when covers/guards or circuit boards are to be removed.
- ◇ Call your dealer for any repairs and be certain original spare parts are used. Failure to observe this rule may adversely affect the safety level of your equipment.
- ◇ The equipment is to be connected to the mains supply and provided with adequate and efficient earth conductors.
- ◇ When installing, leave a clearance of at least 1 cm around the equipment to allow air to pass freely.

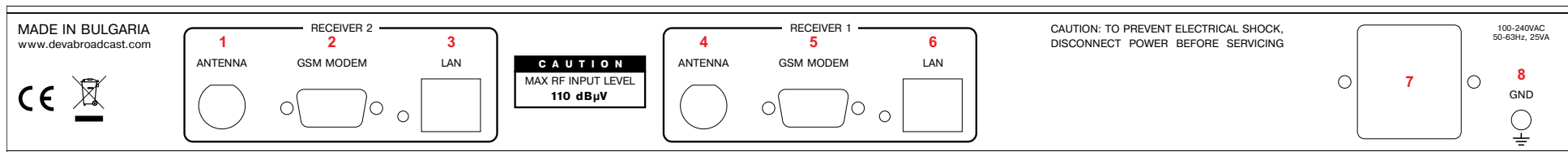
## Panel Indicators and Appointments

### FRONT VIEW



1. Phones Output – Audio signal from the tuned frequency.
2. Power LED Indicator
3. Status
4. RX1 LAN LED Indicator. This LED can be in one of the following states:
  - Off – No User Connected, Logger is active;
  - Blinking – User is connected, Logger is inactive.
5. RX1 GSM LED Indicator. This LED can in one of the following states:
  - Off – no GSM Modem;
  - Fast Blinking – GSM Modem initialization;
  - Slow Blinking – GSM Modem present and operating.
6. RX2 LAN LED Indicator. This LED can be in one of the following states:
  - Off – No User Connected, Logger is active;
  - Blinking – User is connected, Logger is inactive.
7. RX2 GSM LED Indicator. This LED can in one of the following states:
  - Off – no GSM Modem;
  - Fast Blinking – GSM Modem initialization;
  - Slow Blinking – GSM Modem present and operating.

## REAR VIEW



### *Receiver 2*

1. LAN Port / Internet Input – standard RJ-45 port;
2. GSM Modem Connector - DB-15 male;
3. Antenna Input - BNC connector for FM Antenna;

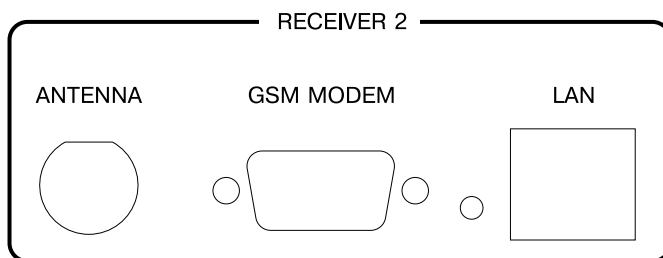
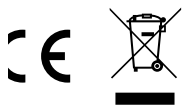
### *Receiver 1*

4. LAN Port / Internet Input – standard RJ-45 port;
5. GSM Modem Connector - DB-15 male;
6. Antenna Input - BNC connector for FM Antenna;

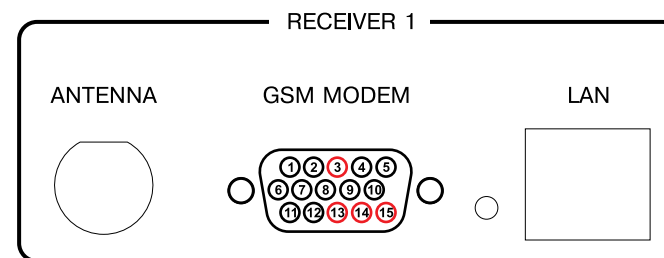
7. Power Supply;
8. GND

## GPO CONNECTOR PINOUTS

MADE IN BULGARIA  
www.devabroadcast.com

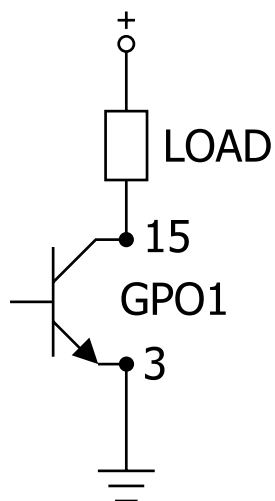


**CAUTION**  
MAX RF INPUT LEVEL  
**110 dBμV**



15 - GPO1 Collector  
14 - GPO2 Collector  
13 - GPO3 Collector

3 - GND



### Electrical Characteristics of GPO

$V_{ec} < 6V$        $I_c < 50mA$   
 $V_{ce} < 45V$        $P_d < 150mW$

## Getting Started

In order for the normal operation of the DB4402-V2 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 DB4402-V2 to the TCP/IP network using direct network cable;
5. Connect the optional GSM modem via the connection cable provided with the 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 62](#).

## 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

The DB4402-V2 is controlled through a built-in WEB Server and a standard Web browser can be used to monitor its status or to make some adjustments. To operate the device you need to know its IP Address. In case you are not aware of it, you can use the Network discovery feature at Local networks.

1. Connect the device to the local network or to the Internet by LAN cable;
2. Open a new WEB Browser and enter the device IP address in the address field then press [Enter]. A new WEB browser with DB4402-V2's Main window will appear;
3. To access the device's settings press [Settings], the default values are *username*: admin and *password*: pass.

## NETWORK DISCOVERY

---

If you have already enabled this function on your computer just open a new Explorer bar and click on Network. The device must be displayed. If not follow the instructions below.

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 panel click "Change advanced sharing settings".
2. Select your current network profile.
3. Click Turn on network discovery, and then click Save changes. If you're prompted for an administrator password or confirmation, type the password or provide confirmation.
4. To access the device open a new Explorer bar and click on Network. If you have successfully enabled the network discovery option, the device will be displayed. Double click on DB4402-V2 will open a new WEB browser with the Main window.
5. To access the device's settings press [Settings], the default values are *username*: admin and *password*: pass.

**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.

## LOGIN

**ATTENTION:** Upon Login on the FM Monitoring receiver, the Logger will stop and will start again automatically after Logout.

The DB4402-V2 can serve two users at a time, one logged in the FM Monitoring receiver, and one logged in the FM Radio Streamer. Username and Password will be requested when connecting. Default values are *user* and *pass*.



DB4402-V2 1 - FM Radio Monitoring Receiver 

**Welcome!**

Username:

Password:

Enter your credentials and press Login button to continue to Main screen.

If the WEB Interface is already in use you will be prompted shortly:



DB4402-V2 1 - FM Radio Monitoring Receiver 

**DB4402-V2 1 is in use.**

Please go [here](#) and try login again later.

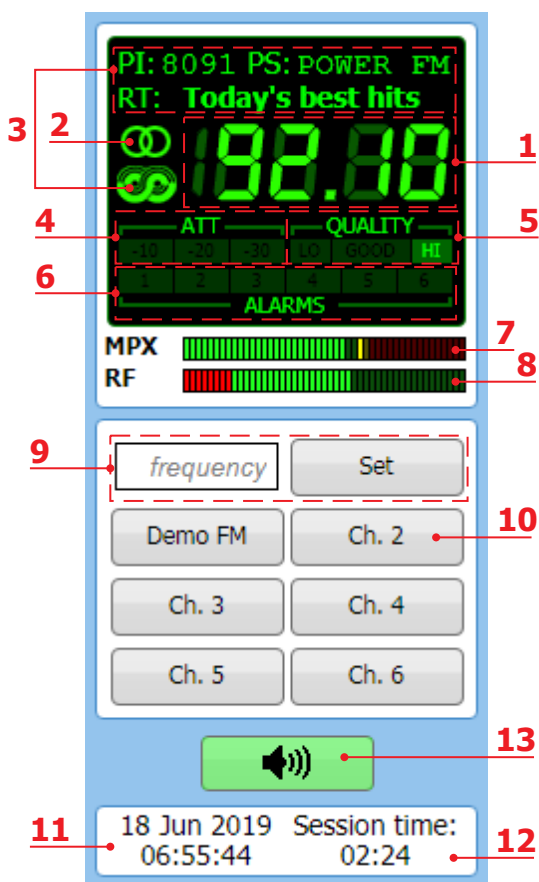
**NOTE:** DB4402-V2 will Logout automatically the current session after the defined WEB session timeout. ([see “Communication Settings” on page 40](#))

# WEB Interface FM Monitoring Receiver

## DEVICE CONTROL INTERFACE

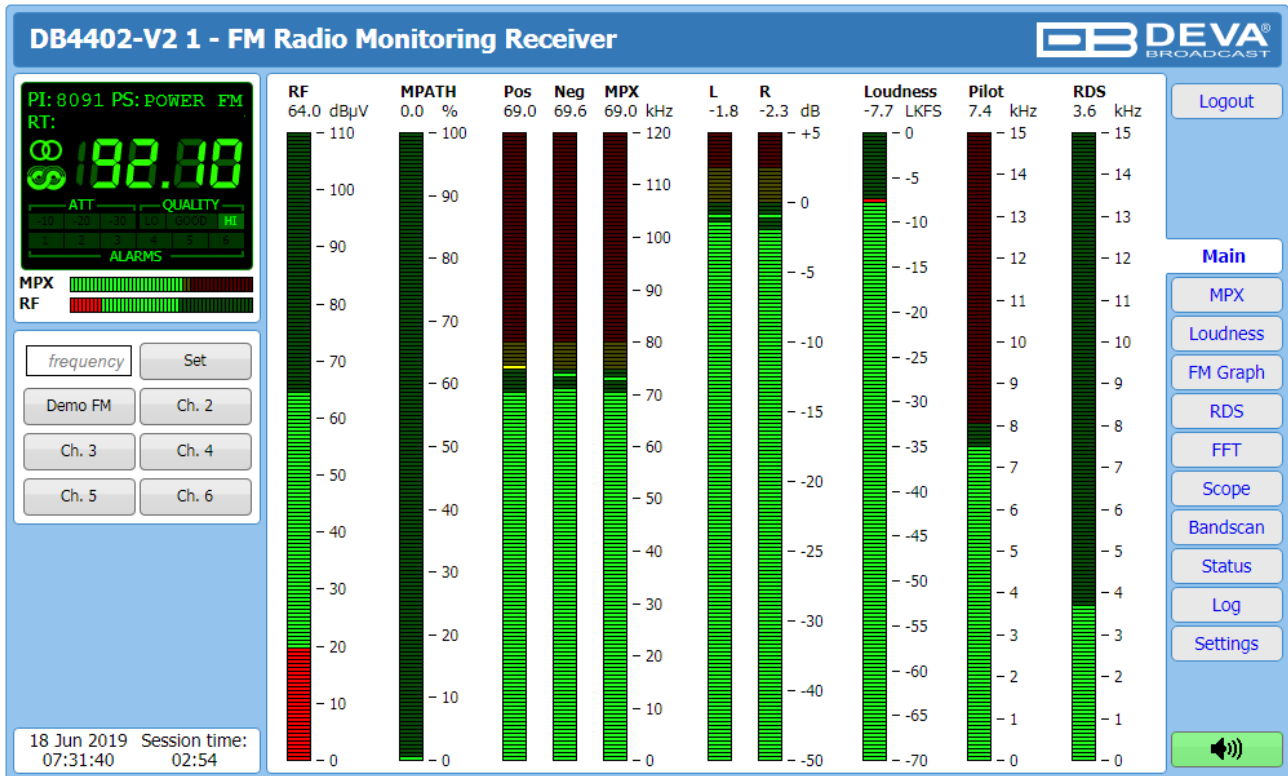
The WEB Interface is visually divided into two sections Left and Right.

- On the Right are 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.



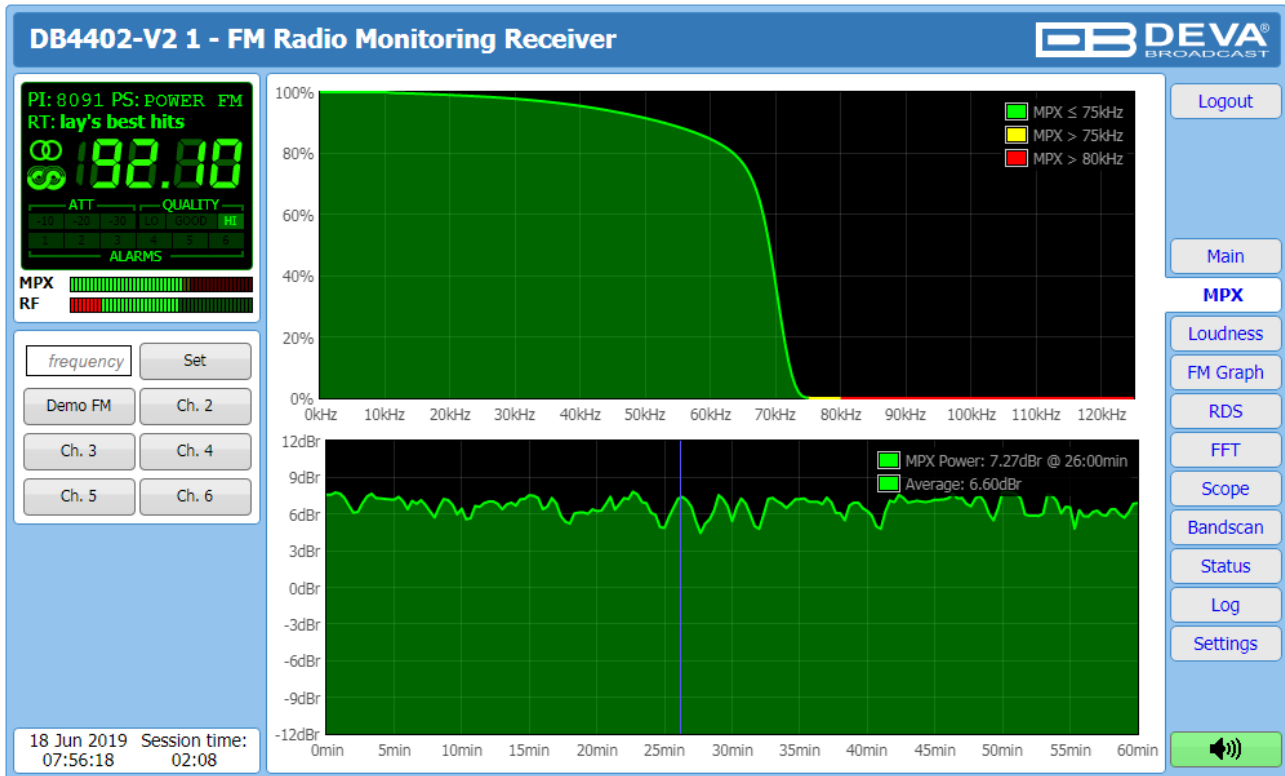
1. Frequency indicator showing currently tuned frequency;
2. Stereo indicator;
3. RDS/RBDS presence indicator & information;
4. RF Attenuator Status;
5. Signal Quality indicator;
6. Channel Alarms indicator – will be lit in red when the Scheduler has detected an alarm on channel. ([see “Channels settings” on page 38](#));
7. MPX Level indicator;
8. RF Level indicator. The red zone (low level) indicates RF level below 20 dBμV;
9. Frequency set buttons;
10. Channel Preset Buttons – when one of the buttons is pressed, the Tuner will be set to the predefined frequency. Upon hovering with the mouse over a preset button, the name of the channel will be displayed;
11. Device Time ([“General Settings” on page 36](#));
12. Session remaining time;
13. Listen Button – Button with double usage used to Play/Stop the current audio stream (an audio device will be required).

## MAIN



The Main Screen of the WEB Interface shows all the mandatory parameters 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 defined by the user.

## MPX

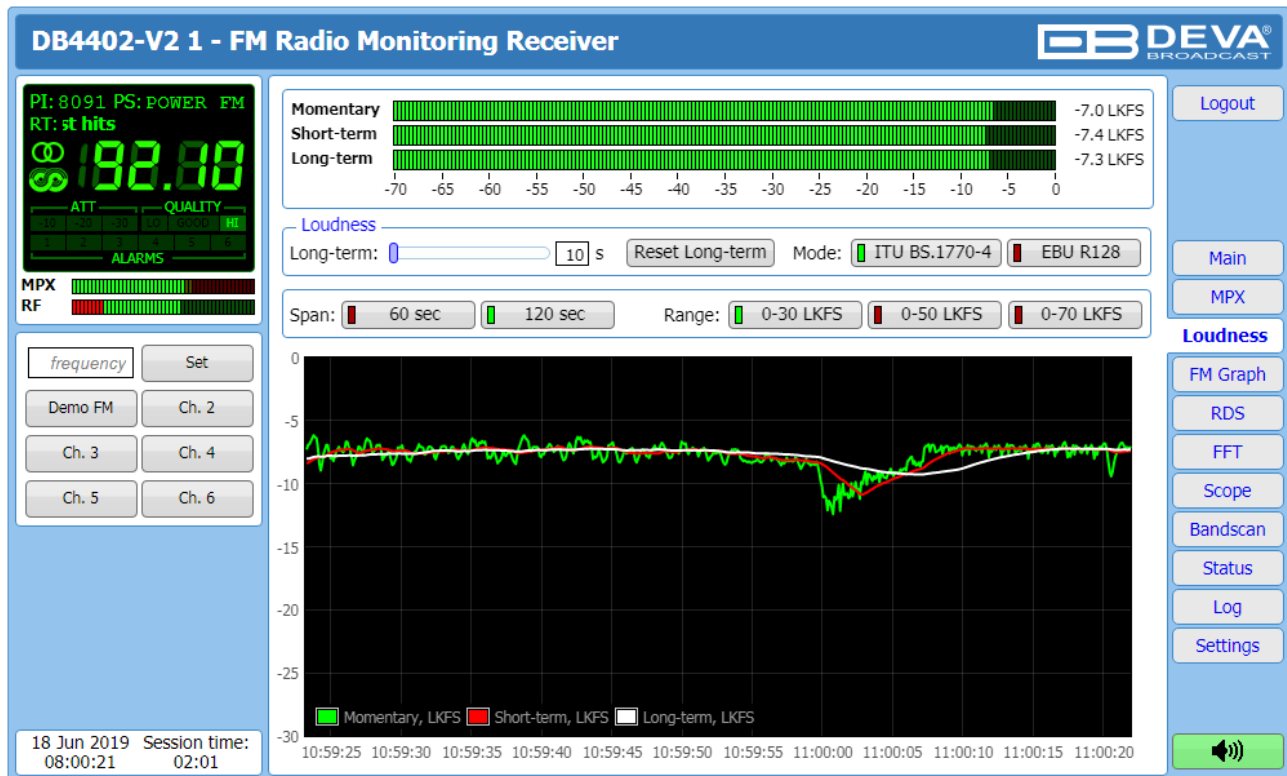


The MPX page shows the baseband MPX deviation as a function of deviation in kHz over the observation period. The graph immediately shows modulation density.

There is also a rolling 60-minute graph of the MPX power with average indicator, measured in dBr. The MPX Power is calculated continuously with an integration window of 60 seconds and a new sample every 20 seconds. Therefore, the first sample is available 60 seconds after tuning.

The rule of MPX Power provides to measure the modulation power which is seen equal to modulate signal electric power, for one minute time period and to compare it to a sinusoidal modulating signal one which deviates  $\pm 19\text{kHz}$ . The result, expressed in dB, must be lower or equal to zero to comply with the rule.

## LOUDNESS



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

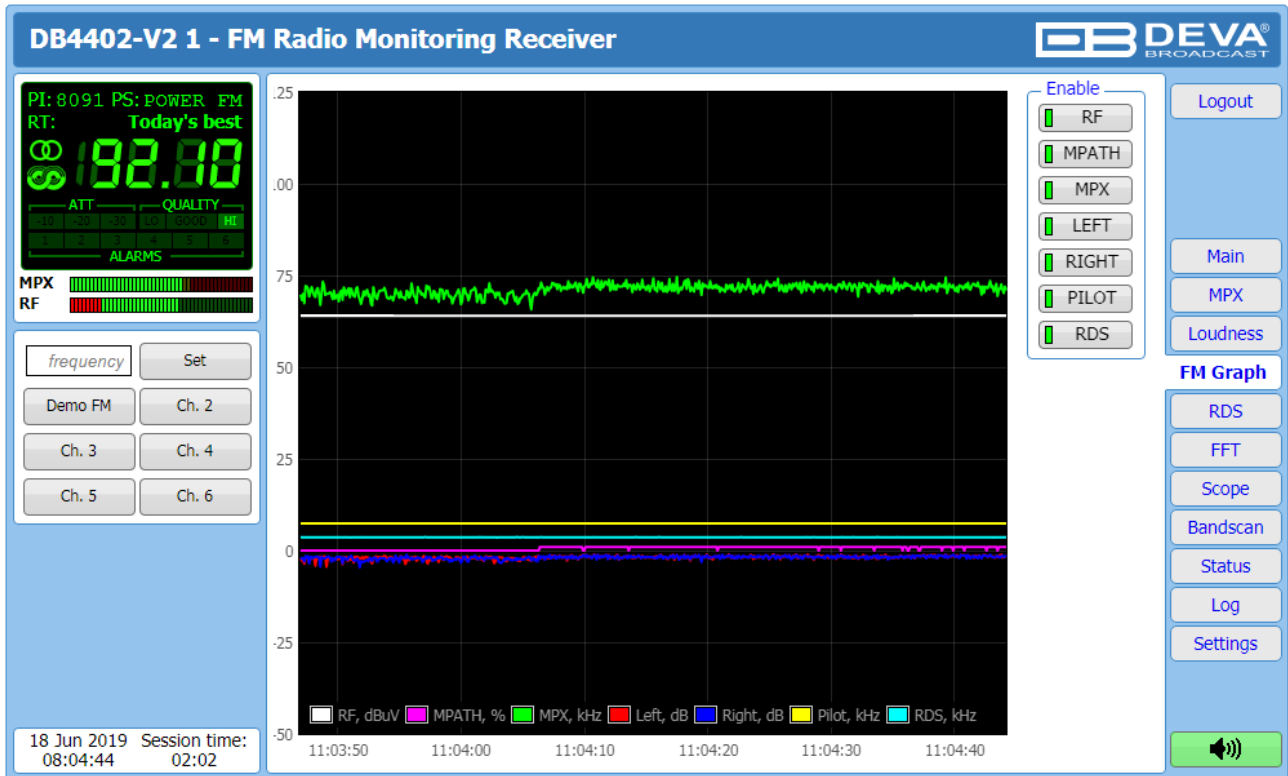
- **Momentary** – average program loudness measured over a 0.4s sliding time window, not gated;
- **Short-term** – average program loudness measured over a 3s sliding time window, not gated;
- **Long-term** – average program loudness measured over a variable sliding time window, gated as described in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

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** – a slider to select the length of the Long-term loudness measurement sliding time window, from 10s to 120s;
- **[Reset Long-term]** – a button to reset Long-term measurement;
- **Mode** – select between [ITU BS.1770-4] and [EBU R128] mode;
- **Span** – select time graph time span;
- **Range** – select time graph measurement range.

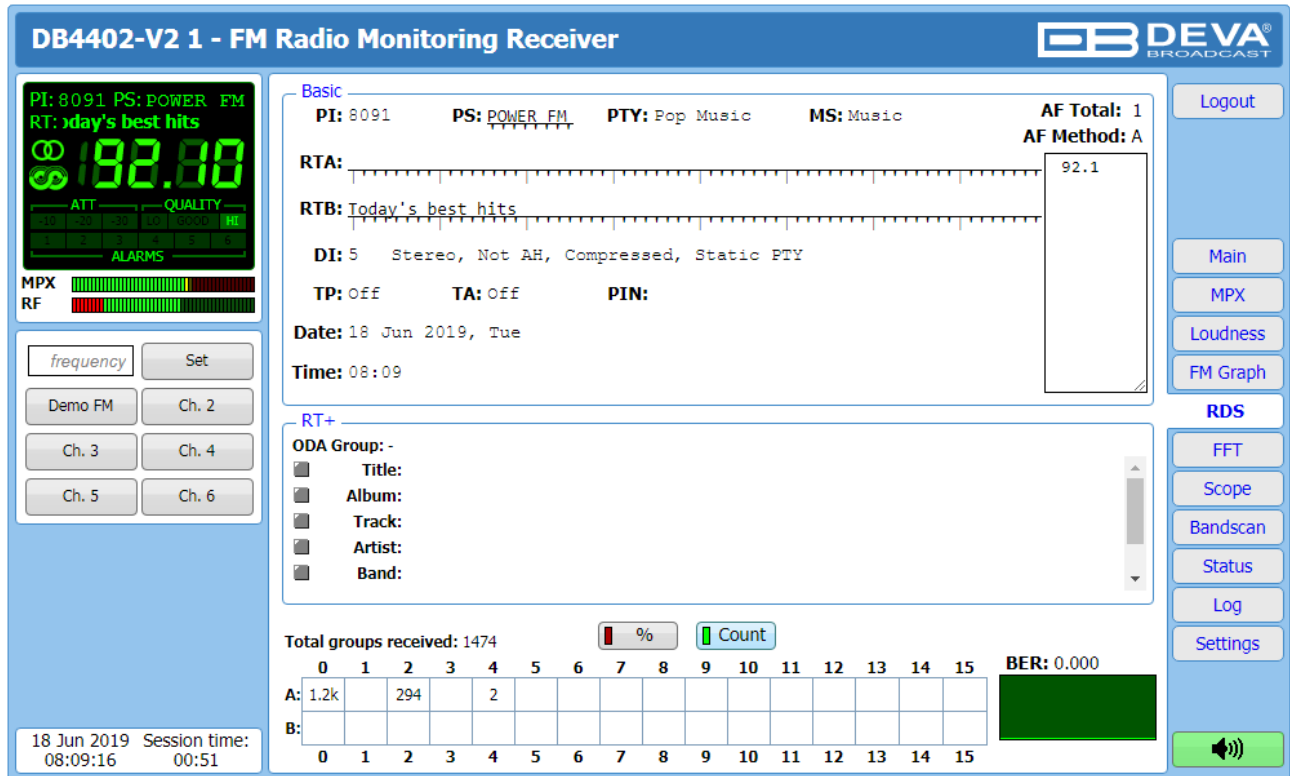
## FM GRAPH



This screen represents all mandatory signals over a time span of 120 seconds. All parameters have their own color representation and measurement units, visible below the graph.

According to your needs, the signals listed in the right-hand section 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 of the screen.

## RDS/RBDS



One of our core competencies lies in the RDS/RBDS. The RDS/RBDS page is very comprehensive, with a display of the RadioText (RTA and RTB), basic RDS/RBDS fields and a table of all decoded RDS/RBDS groups with a percentage measurement based on the overall RDS/RBDS data stream or group count. A very useful graph on this display is the rolling RDS/RBDS bit error rate (BER) display.

Total groups received 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 displayed: as Percents [%] or [Count], by selecting the corresponding button.

**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 a studied 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.

### Basic RDS

**PI/CALL** (Program Identification) – The PI code is your station’s ‘digital address’. It is a hexadecimal code that is assigned by an appropriate broadcasting authority in most countries, but in the United States the PI code is numerically calculated from the station’s call sign. We have provided a calculator utility within the DB4402-V2. An in-depth discussion of the mathematical calculation is given in RDS/RBDS Standard.;

**PS** (Program Service Name) – This is the station’s “street name” that will appear on the receiver faceplate display. The PS can be up to eight characters in length (including spaces) and can be as simple as the station’s call letters: KWOW or KWOW FM, or a slogan: NEWSTALK or LIVE 95.

**PTY** (Program Type) – The PTY data flag identifies the station format from a pre-defined categories. Many RDS receivers are able to seek the listener’s preferred format automatically.

This means that a car radio can switch from a fading station to a stronger one that carries the same variety of music, though not the very same program, as provided by AF switching. The PTY function of RDS helps a broadcaster catch 'transient audience' share. The PTY code is not meant to change from song to song or to accommodate a top-of-the-hour newscast, however.

**MS** (Music/Speech Switch) – This flag simply indicates whether music or speech is the primary broadcast programming.

**RT** (Radio Text) – This is a 64-character block of plain text that the listener can select for visual display on the faceplate of the radio by pressing an INFO button on the receiver. This function is not available on many automobile radios for safety reasons, which has precipitated the frowned-upon practice of scrolling the PS field instead. The Radio Text can announce song titles and performers, run special promotions or contests, or broadcast sponsors' messages.

**DI** (Decoder Information) – This is one of several 'flags' that convey yes/no or other very basic data. This particular flag tells the receiver whether the broadcast is monaural, or is being transmitted in any of several methods of stereo or binaural broadcasting.

**TP** (Traffic Program Identification) – The TP flag identifies the station as one that routinely broadcasts traffic bulletins for motorists as part of its normal, everyday programming. When the TP flag is displayed on the receiver faceplate, the radio is searching for traffic announcements. The radio keeps track of TP stations offering this service to speed up the search-and-switch process.

**TA** (Traffic Announcement) – This is a temporary flag added to the RDS data stream only when a traffic bulletin is being aired. Some RDS car radios can be set to search for traffic bulletins among various TP stations while tuned to a listener's preferred program, or even while playing a tape or CD. As soon as any TP station broadcasts a traffic bulletin, the receiver temporarily switches-over to receive it. When the bulletin is finished, the receiver switches back to the original program, tape or CD.

**List of Alternative Frequencies** – A network broadcaster, or one with low-power rebroadcast transmitters (translators) to fill holes in his coverage area, can include a list of all frequencies where the identical program can be heard simultaneously. The RDS receiver (particularly the upscale car radio) constantly searches for the best signal that carries the very same program. When a better signal is found, the radio re-tunes with no noticeable interruption. The principal utility of this RDS function is with European radio networks and US stations with 'translators.'

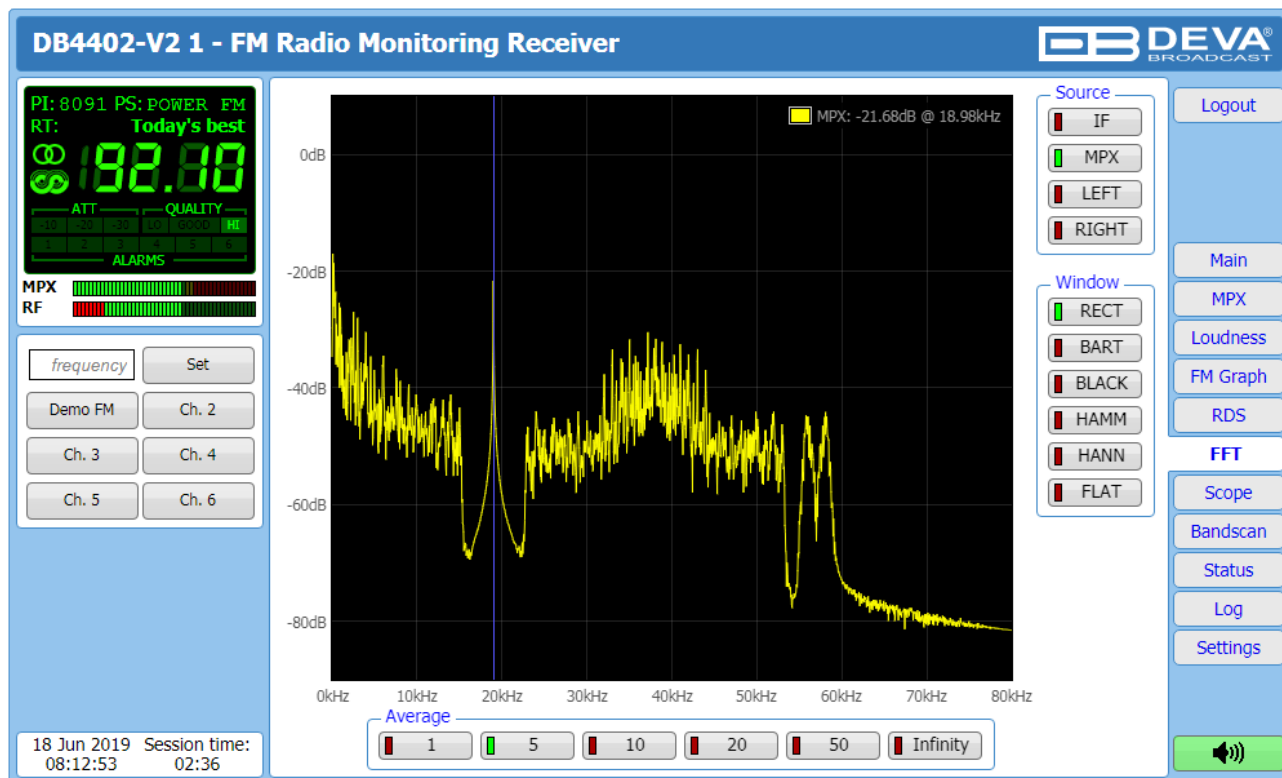
**PIN** - Program Item Number: The code enables the designed to use this feature receivers and recorders to respond to the preselected by the user program item(s). This feature is used via scheduled program time, to which in order to avoid ambiguity is added the day of the month.

**Date and Time** – Decoded CT information.

### Radio Text +

RadioText Plus is “semantic analogue radio”. It allows the RDS feature RadioText (RT) to be read by the FM RDS receiving terminals. Based on the RDS RT messages, RT+ is completely backwards compatible with RT. The usage of RT+ allows the listener/user to derive additional benefits from the RDS Radio Text service. It enables FM RDS receivers to “read” Radio Text (to recognize designated objects and make them manageable) by user’s direct access to specific elements of the Radio Text messages. For example, that element could be programme associated metadata like Title and Artist of the currently playing song or a news headlines. This provides the listener with an “mp3-player feeling” while listening to analogue FM radio. The elements can also carry additional service messages or information about the Radio Station such as the telephone number or the web address of the Radio Station’s hotline. These objects, or more accurately RT+ information elements carried in the RDS RadioText (RT) messages, are identified by their location within the RT messages and by the class code of their content type. Once an information element is received and understood, a receiver is able to, for example, store the different RT+ information elements and the listener may then select and request a specific content type from the radio’s memory at an instant in time that suits the listener’s needs. Thus the listener is no longer forced to watch the RT information passing (scrolling) by. Moreover, RT+ offers selected RT message elements to car drivers on a static display, without risk of distracting the attention of the driver. Furthermore, RT+ is well suited for mobile phones with built-in FM receivers: telephone numbers can be directly used to initiate calls, and web addresses can be used to start browsing the web content offered by the radio programme provider. Last but not least, RT+ is also used for satellite radio broadcasting via DVB-S. It may be adopted by DRM and DAB in the future, too.

## FFT



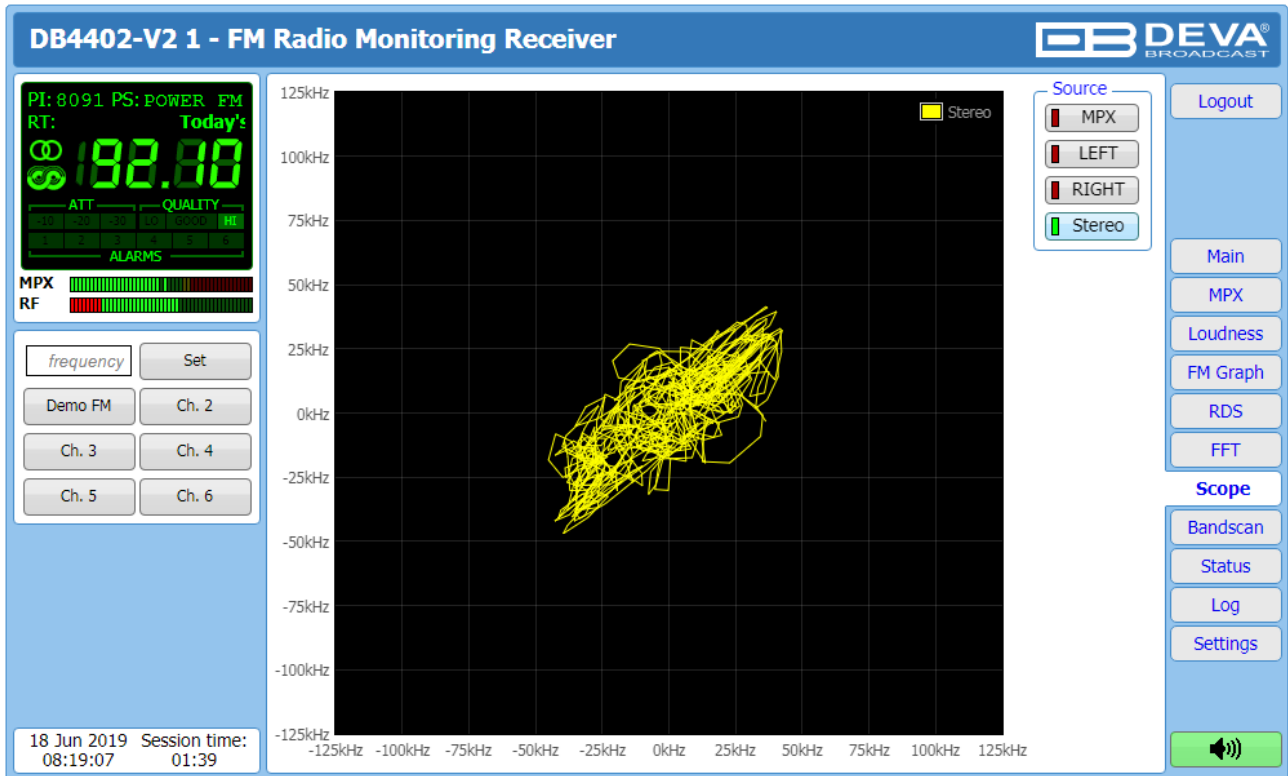
The spectrum analyzer tab is a very useful feature: It is a MPX and audio spectrum display. Initially it shows the MPX from 0-65kHz so that the readings of the currently selected source (composite MPX or stereo Left/Right) to be clearly visible. The signal source to be calculated and visualized is chosen from the Source section placed on the right part of the screen. Spectral components of the selected signal are determined on the base of Fast Fourier Transform.

The window function can be selected through the relevant menu with interactive buttons. The available windows and their features are given below. This table can be used to 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

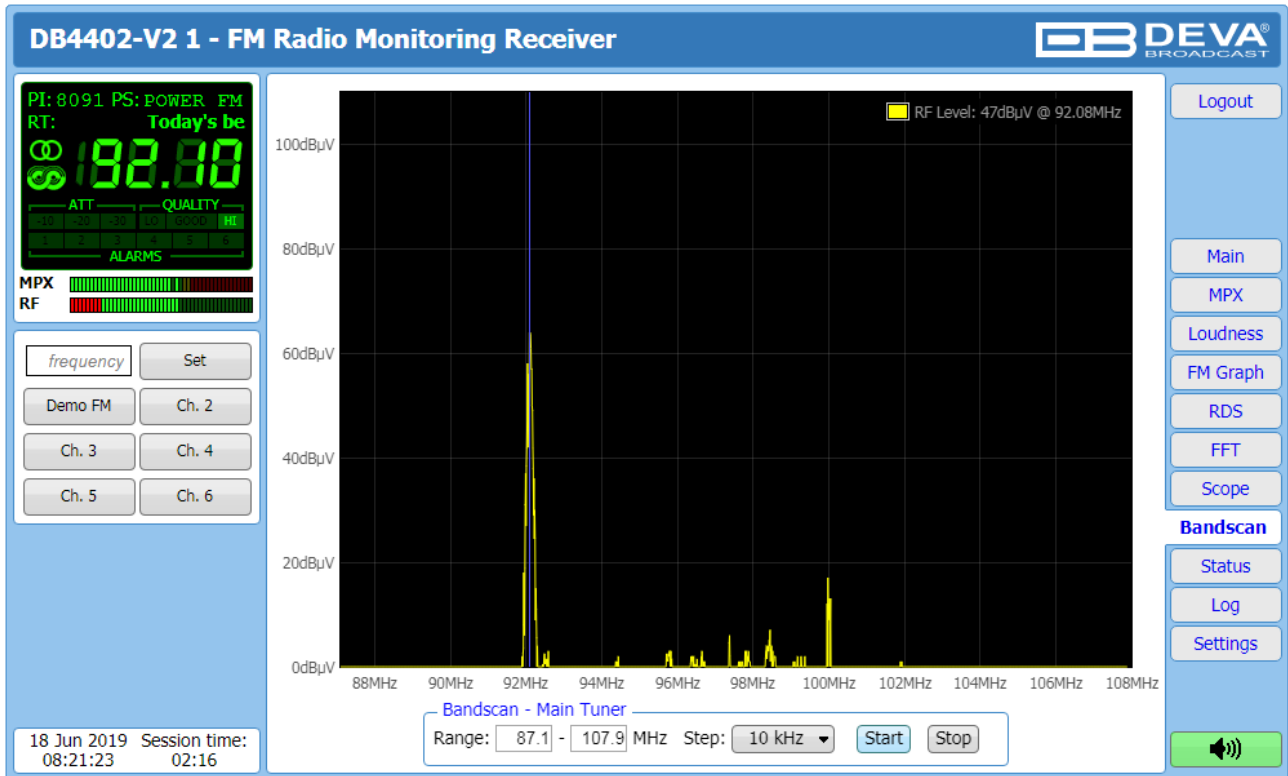
The visualized Spectrum waveform is equivalent of the average value of several measurements which are defined in section “Average”. The radio frequency to be observed could be easily set by using the preset buttons, placed on the left part of the screen.

## 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

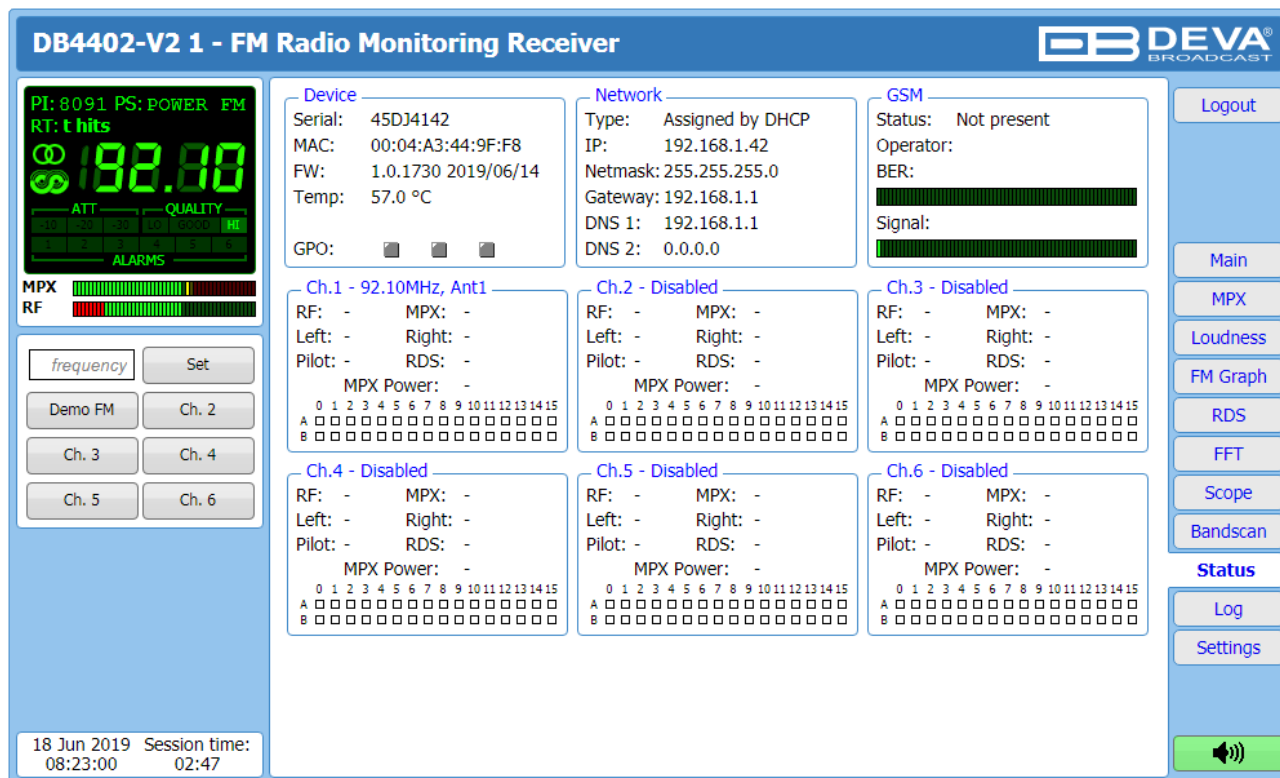


This Screen evaluates FM broadcast band congestion by sweeping the tuner across the FM band, logging every carrier and generating a spectrum display of carrier level vs. frequency.

The Bandscan application utilizes four different types of Bandscan, depending on the preferred signal frequency step. The bandscanning mode could be customized by setting low and high frequency limits of the scan. Once you have set the frequency step and low/high frequencies, the start button should be pressed in order for the Bandscan process to be initiated. The current scan could be stopped at any time by pressing the [Stop] button.

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

## STATUS



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.). If a GSM modem is connected, the status of the modem will also be depicted in the relevant section.

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


- In range - green OK;
- Out of range - red LOW, HIGH or LOSS;
- 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

DB4402-V2 1 - FM Radio Monitoring Receiver



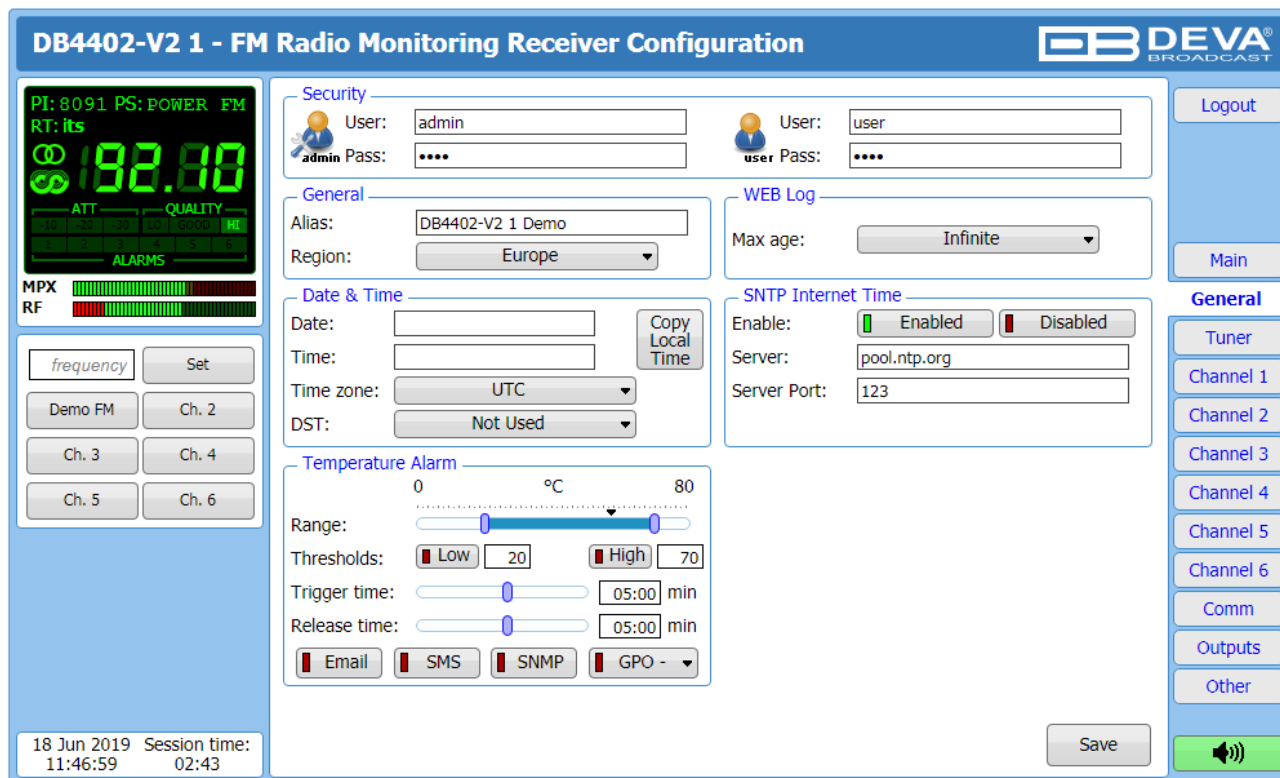
PI: 8091 PS: POWER FM  
 RT: Today's best hits  
192.00  
 ATT:   
 QUALITY:   
 ALARMS:   
 MPX:   
 RF:

18 Jun 2019 Session time:  
 08:25:27 00:20

2019-06-18 07:31:34	Control	Channel log suspended, WEB Login
2019-06-18 07:34:35	Control	WEB Logout, 192.168.1.1
2019-06-18 07:34:45	Control	Channel log resumed
2019-06-18 07:55:14	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 07:55:14	Control	Channel log suspended, WEB Login
2019-06-18 07:58:27	Control	WEB Logout, 192.168.1.1
2019-06-18 07:58:37	Control	Channel log resumed
2019-06-18 07:59:09	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 07:59:09	Control	Channel log suspended, WEB Login
2019-06-18 08:02:23	Control	WEB Logout, 192.168.1.1
2019-06-18 08:02:33	Control	Channel log resumed
2019-06-18 08:02:41	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 08:02:41	Control	Channel log suspended, WEB Login
2019-06-18 08:06:46	Control	WEB Logout, 192.168.1.1
2019-06-18 08:06:56	Control	Channel log resumed
2019-06-18 08:07:06	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 08:07:06	Control	Channel log suspended, WEB Login
2019-06-18 08:10:07	Control	WEB Logout, 192.168.1.1
2019-06-18 08:10:17	Control	Channel log resumed
2019-06-18 08:11:02	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 08:11:02	Control	Channel log suspended, WEB Login
2019-06-18 08:15:30	Control	WEB Logout, 192.168.1.1
2019-06-18 08:15:40	Control	Channel log resumed
2019-06-18 08:17:34	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 08:17:34	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 DB4402-V2 and an FTP Client should be configured, please refer to [“Download files via FTP” on page 68](#).

## GENERAL SETTINGS



DB4402-V2 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 DB4402-V2 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.

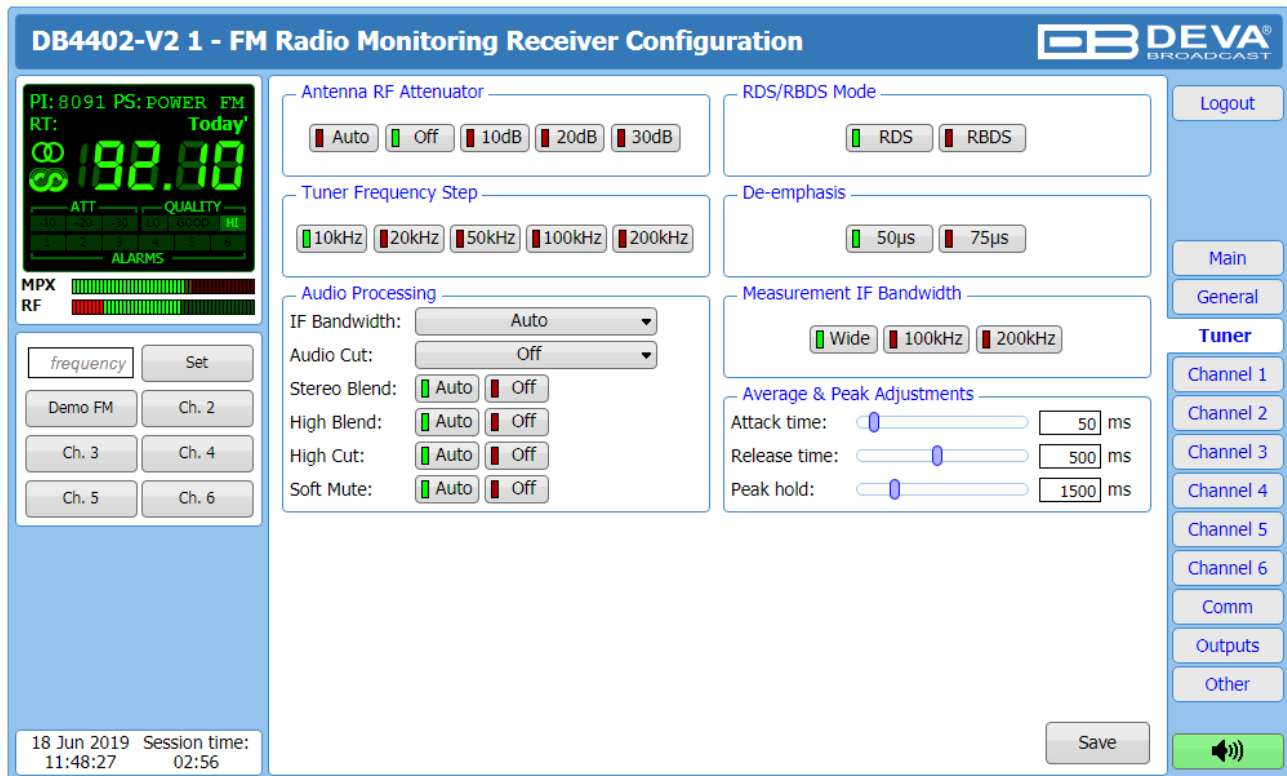
**Date & Time** – used for manually set the current Date and Time. [Copy Local Time] button will set the Date and Time to correspond to that of your computer.

**SNTP Internet Time** – Synchronizes automatically the DB4402-V2 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).

**Temperature Alarm** – Detects abnormal temperature of the equipment. Define the parameters under which a temperature alarm to be generated.

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

## TUNER SETTINGS



**DB4402-V2 1 - FM Radio Monitoring Receiver Configuration**

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

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

**RDS/RBDS Mode**: ☒ RDS ☐ RBDS

**De-emphasis**: ☒ 50µs ☐ 75µs

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

**Measurement IF Bandwidth**: ☒ Wide ☐ 100kHz ☐ 200kHz

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

**Save**

**Logout**

**Main**  
**General**  
**Tuner**  
 Channel 1  
 Channel 2  
 Channel 3  
 Channel 4  
 Channel 5  
 Channel 6  
 Comm  
 Outputs  
 Other

18 Jun 2019 Session time: 11:48:27 02:56

The Tuner Section gives full control over Tuner settings.

**Antenna RF Attenuator** – Allows the preferred attenuator value to be set.

**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.

## CHANNELS SETTINGS (CHANNELS 1 TO 6)

**DB4402-V2 1 - FM Radio Monitoring Receiver Configuration**


PI: 8091 PS: POWER FM  
RT: Best Radio Station i

188.80

ATT: [ ] QUALITY: [ ]

MPX [ ] RF [ ]

ALARMS [ ]

frequency Set

POWER FM ENERGY

Radio 1 Ch.4 98.10

Ch.5 98.10 Ch.6 98.10

**Channel 1**

Name:  Frequency, MHz:  Acq. time:  s

☐ Disabled ☒ Enabled E-mail:

**RF Alarm**

20 dBµV 110

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☒ SMS ☐ SNMP ☐ GPO -

**Pilot Alarm**

0 kHz 15

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

**MPX Alarm**

0 kHz 125

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

**MPX Power Alarm**

-12 dBr +12

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

**Left Audio Alarm**

-50 dB +5

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

**Right Audio Alarm**

-50 dB +5

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

**RDS Alarm**

0 kHz 15

Alarm:

Warning:

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

**RDS Group Alarm**

A: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

B: ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Trigger time:  min

Release time:  min

☐ Email ☐ SMS ☐ SNMP ☐ GPO -

18 Jun 2019 Session time: 11:48:27
Export Import
Save

Logout

Main

General

Tuner

**Channel 1**

Channel 2

Channel 3

Channel 4

Channel 5

Channel 6

Comm

Outputs

Other

The DB4402-V2 can monitor up to 6 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 six parameters: RF, Left and Right audio levels, MPX (baseband) deviation, Pilot and RDS/RBDS deviation. 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

- [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;
- 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.

**NOTE:** When MPX Power alarm is enabled the observation time must be more than 70 seconds.

**NOTE:** In order to have correct Long-term loudness value logged in log file channel observation time must be more than the Long-term loudness measurement sliding time window (see [“Loudness” on page 26](#)).

### 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.

## COMMUNICATION SETTINGS

**DB4402-V2 1 - FM Radio Monitoring Receiver Configuration**


PI: 8091 PS: POWER FM  
RT: best hits

182.80

ATT:  QUALITY:

ALARMS:

MPX:  RF:

frequency

Set

Demo FM

Ch. 2

Ch. 3

Ch. 4

Ch. 5

Ch. 6

**Network**

Enable: ☒ Enabled ☐ Disabled

DHCP: ☒ Enabled ☐ Disabled

IP Address:

Netmask:

Gateway:

Primary DNS:

Sec. DNS:

**GSM Modem**

Number 1:

Number 2:

Number 3:

Number 4:

Number 5:

Baudrate:

Modem Type:

**HTTP Server**

Enable: ☒ Enabled ☐ Disabled

Server Port:

Session time:  min

**Application Server**

Enable: ☒ Enabled ☐ Disabled

Server Port:

Session time:  min

**FTP Server**

Enable: ☒ Enabled ☐ Disabled

Cmd Port:

Data Port:

**Audio Stream Server**

Enable: ☒ Enabled ☐ Disabled

Server Port:

Quality:

**SNMP Agent**

Agent: ☒ Enabled ☐ Disabled

Agent Port:

Agent ses. time:  min

Agent ID:

Read Community:

Write Community:

Manager IP:

Manager Port:

SNMP MIB File:

**E-mail**

Enable: ☒ SMTP ☐ DEVA ☐ Disabled

E-mail 1:

E-mail 2:

Sender:

Username:

Password:

Host name:

Connection:

Server:

Server Port:

18 Jun 2019 Session time:  
11:54:33 02:37

⚠ - These settings require reboot.

**Logout**

**Main**

**General**

**Tuner**

**Channel 1**

**Channel 2**

**Channel 3**

**Channel 4**


**Channel 5**

**Channel 6**

**Comm**

**Outputs**

**Other**



### 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, DB4402-V2 will use AutoIP and will generate an IP Address.

### 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:

DB4402-V2 Test Message.

**NOTE:** The current condition of the GSM Modem could be checked in the Status Screen. For detailed explanation of the option, please refer to [“GSM Modem Option” on page 62](#).

### HTTP Server

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

### FTP Server

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

### Audio Stream Server

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

### SNMP Agent

**Agent** - [Enabled]/[Disabled] the SNMP Agent.

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

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

Press the [Download] button to download the latest available DB4402-V2 SNMP MIB file.

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

### E-mail

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

1. Enter the desired alarm recipients in e-mail 1 and/or e-mail 2 fields.
2. Fill in your e-mail account settings: Sender, Username and Password, Server, SMTP 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:

DB4402-V2 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:

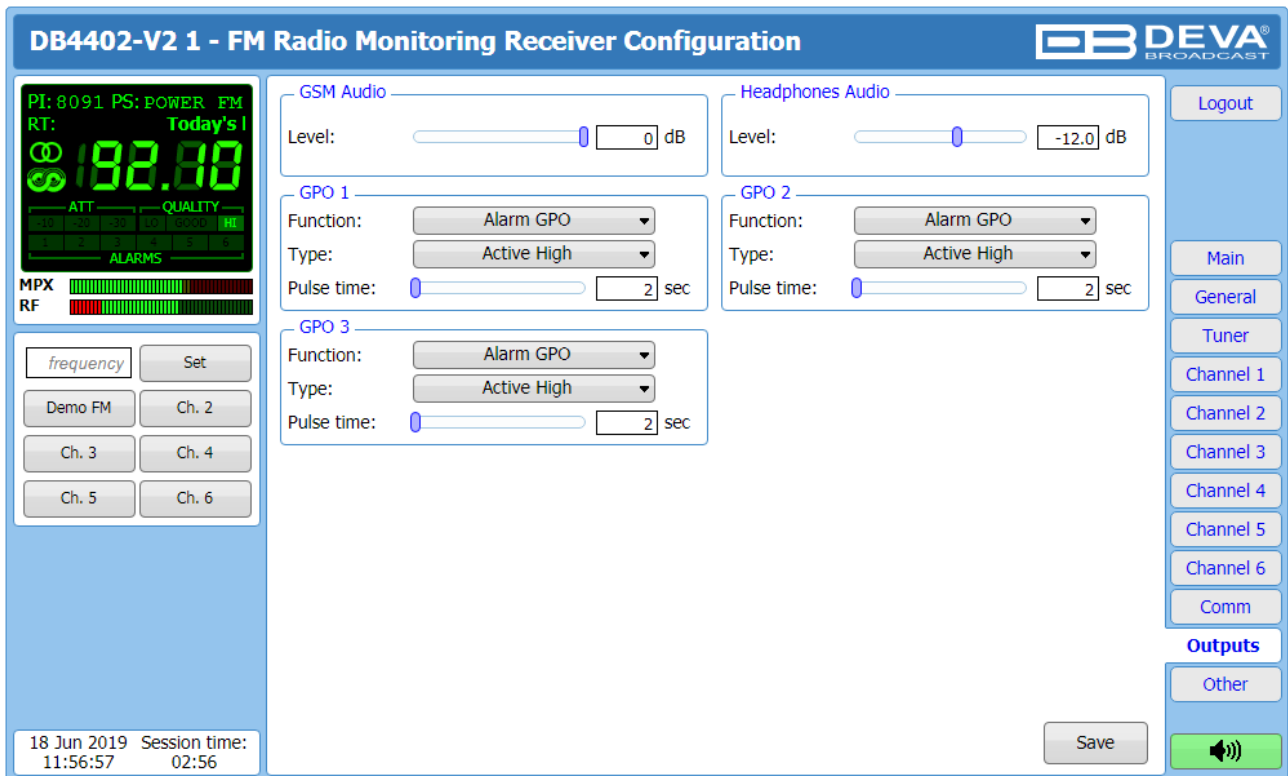
DB4402-V2 Test Message.

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



**DB4402-V2 1 - FM Radio Monitoring Receiver Configuration**

**GSM Audio**  
 Level:  dB

**Headphones Audio**  
 Level:  dB

**GPO 1**  
 Function:   
 Type:   
 Pulse time:  sec

**GPO 2**  
 Function:   
 Type:   
 Pulse time:  sec

**GPO 3**  
 Function:   
 Type:   
 Pulse time:  sec

frequency Set  
 Demo FM Ch. 2  
 Ch. 3 Ch. 4  
 Ch. 5 Ch. 6

18 Jun 2019 Session time:  
 11:56:57 02:56

Logout  
 Main  
 General  
 Tuner  
 Channel 1  
 Channel 2  
 Channel 3  
 Channel 4  
 Channel 5  
 Channel 6  
 Comm  
**Outputs**  
 Other

Save

**GSM Audio** – interactive slider used to adjust the Level of the GSM Audio.

**Headphones Audio** – interactive slider used to adjust the Level of the Headphones Audio.

**GPO 1, GPO 2, GPO 3** – 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.

## OTHER SETTINGS

**DB4402-V2 1 - FM Radio Monitoring Receiver Configuration**

PI: 8091 PS: POWER FM  
RT: 192.00  
ATT: [ ] QUALITY: [ ]  
MPX: [ ] RF: [ ]  
ALARMS: [ ]

frequency [ ] Set [ ]  
Demo FM [ ] Ch. 2 [ ]  
Ch. 3 [ ] Ch. 4 [ ]  
Ch. 5 [ ] Ch. 6 [ ]

18 Jun 2019 Session time:  
11:59:12 02:58

**Firmware Update**  
Firmware file: Choose File No file chosen  
Upload  
DSP: 1.0.1730 2019/06/14  
TUN: 1.0.1730 2019/06/14  
LIB: 1.0.1729 2019/06/14

**Storage**  
Used Space: 48.78 MB  
Free Space: 7329.22 MB  
Format

**System Log**  
Clear

**Factory Defaults**  
All except IP

**Reboot Device**  
Reboot

Logout  
Main  
General  
Tuner  
Channel 1  
Channel 2  
Channel 3  
Channel 4  
Channel 5  
Channel 6  
Comm  
Outputs  
Other

### Firmware Update

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

### Storage

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

### System Log

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

### Factory Defaults

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

To restore DB4402-V2 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

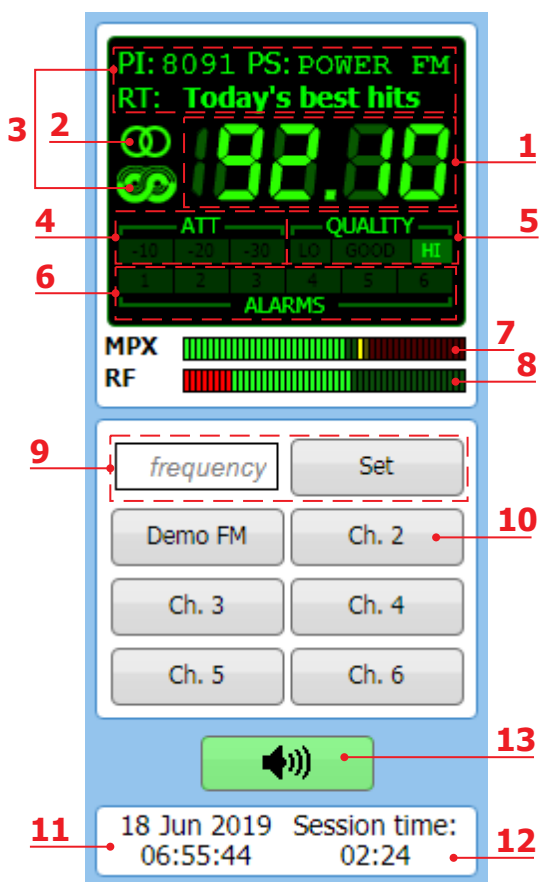
To start Rebooting of DB4402-V2, press the [Reboot] button. A dialog warning window will appear. Confirm that you want to reboot the device and wait for the process to be completed.

# WEB Interface FM Radio Streamer

## DEVICE CONTROL INTERFACE

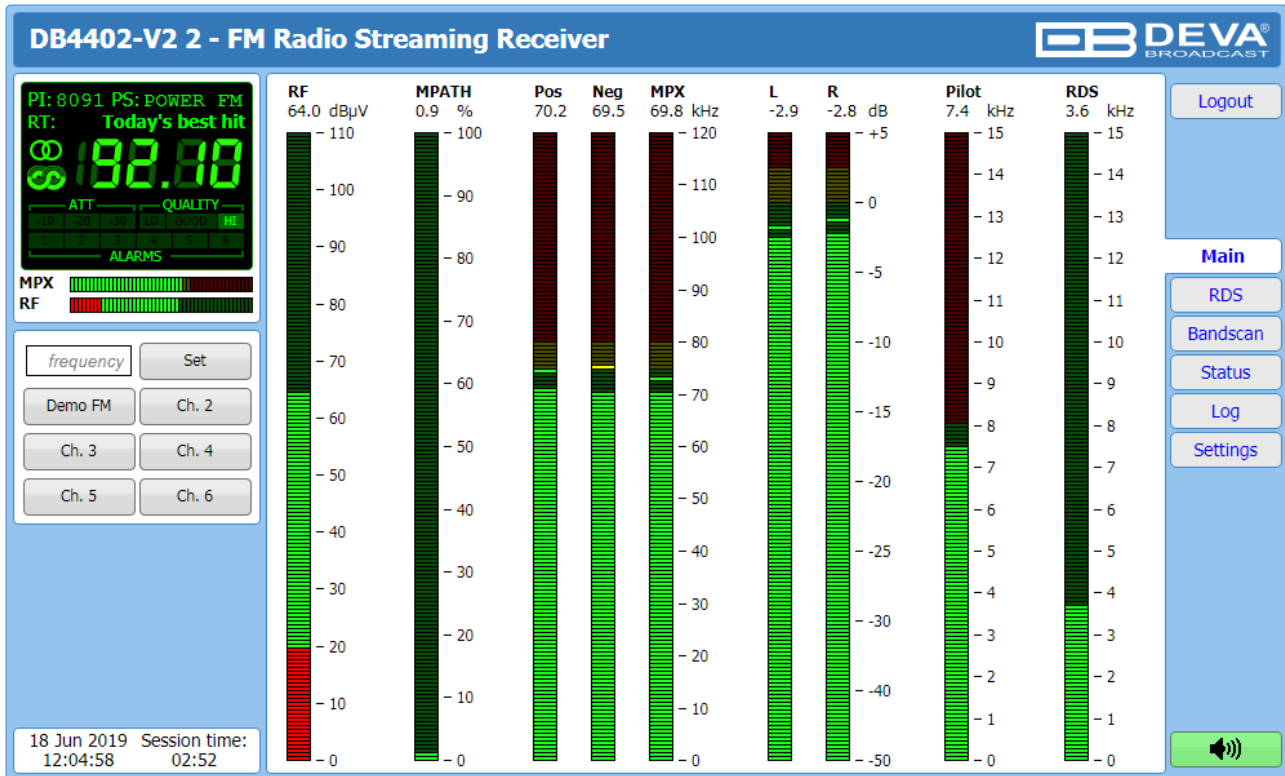
The WEB Interface is visually divided into two sections Left and Right.

- On the Right are 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.



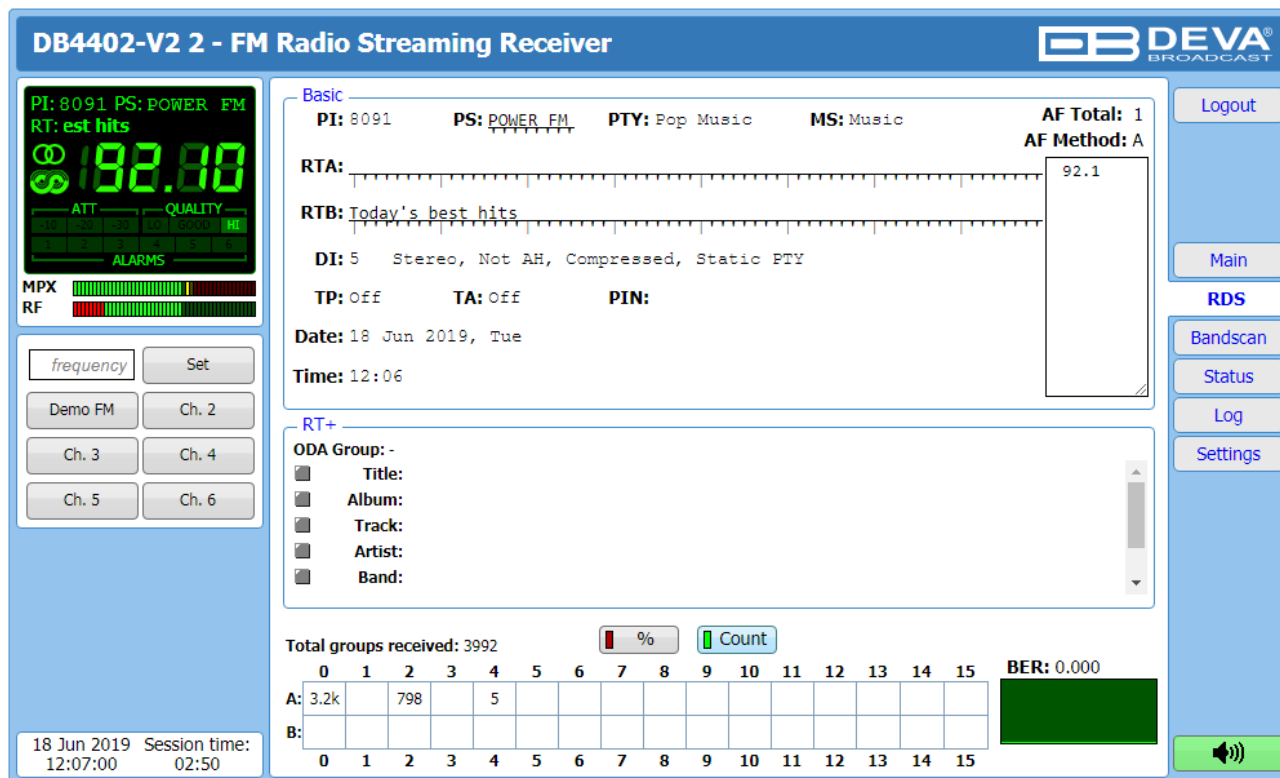
1. Frequency indicator showing currently tuned frequency;
2. Stereo indicator;
3. RDS/RBDS presence indicator & information;
4. RF Attenuator Status;
5. Signal Quality indicator;
6. Channel Alarms indicator – will be lit in red when the Scheduler has detected an alarm on channel. ([see “Streamer Channels settings” on page 54](#));
7. MPX Level indicator;
8. RF Level indicator. The red zone (low level) indicates RF level below 20 dBμV;
9. Frequency set buttons;
10. Channel Preset Buttons – when one of the buttons is pressed, the Tuner will be set to the predefined frequency. Upon hovering with the mouse over a preset button, the name of the channel will be displayed;
11. Device Time ([see “Streamer General Settings” on page 52](#));
12. Session remaining time;
13. Listen Button – Button with double usage used to Play/Stop the current audio stream (an audio device will be required).

## MAIN



The Main Screen of the WEB Interface shows all the mandatory parameters 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 defined by the user.

## RDS/RBDS



One of our core competencies lies in the RDS/RBDS. The RDS/RBDS page is very comprehensive, with a display of the RadioText (RTA and RTB), basic RDS/RBDS fields and a table of all decoded RDS/RBDS groups with a percentage measurement based on the overall RDS/RBDS data stream or group count. A very useful graph on this display is the rolling RDS/RBDS bit error rate (BER) display.

Total groups received 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 displayed: as Percents [%] or [Count], by selecting the corresponding button.

**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 a studied 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.

### Basic RDS

**PI/CALL** (Program Identification) – The PI code is your station’s ‘digital address’. It is a hexadecimal code that is assigned by an appropriate broadcasting authority in most countries, but in the United States the PI code is numerically calculated from the station’s call sign. We have provided a calculator utility within the DB4402-V2. An in-depth discussion of the mathematical calculation is given in RDS/RBDS Standard.;

**PS** (Program Service Name) – This is the station’s “street name” that will appear on the receiver faceplate display. The PS can be up to eight characters in length (including spaces) and can be as simple as the station’s call letters: KWOW or KWOW FM, or a slogan: NEWSTALK or LIVE 95.

**PTY** (Program Type) – The PTY data flag identifies the station format from a pre-defined categories. Many RDS receivers are able to seek the listener’s preferred format automatically.

This means that a car radio can switch from a fading station to a stronger one that carries the same variety of music, though not the very same program, as provided by AF switching. The PTY function of RDS helps a broadcaster catch 'transient audience' share. The PTY code is not meant to change from song to song or to accommodate a top-of-the-hour newscast, however.

**MS** (Music/Speech Switch) – This flag simply indicates whether music or speech is the primary broadcast programming.

**RT** (Radio Text) – This is a 64-character block of plain text that the listener can select for visual display on the faceplate of the radio by pressing an INFO button on the receiver. This function is not available on many automobile radios for safety reasons, which has precipitated the frowned-upon practice of scrolling the PS field instead. The Radio Text can announce song titles and performers, run special promotions or contests, or broadcast sponsors' messages.

**DI** (Decoder Information) – This is one of several 'flags' that convey yes/no or other very basic data. This particular flag tells the receiver whether the broadcast is monaural, or is being transmitted in any of several methods of stereo or binaural broadcasting.

**TP** (Traffic Program Identification) – The TP flag identifies the station as one that routinely broadcasts traffic bulletins for motorists as part of its normal, everyday programming. When the TP flag is displayed on the receiver faceplate, the radio is searching for traffic announcements. The radio keeps track of TP stations offering this service to speed up the search-and-switch process.

**TA** (Traffic Announcement) – This is a temporary flag added to the RDS data stream only when a traffic bulletin is being aired. Some RDS car radios can be set to search for traffic bulletins among various TP stations while tuned to a listener's preferred program, or even while playing a tape or CD. As soon as any TP station broadcasts a traffic bulletin, the receiver temporarily switches-over to receive it. When the bulletin is finished, the receiver switches back to the original program, tape or CD.

**List of Alternative Frequencies** – A network broadcaster, or one with low-power rebroadcast transmitters (translators) to fill holes in his coverage area, can include a list of all frequencies where the identical program can be heard simultaneously. The RDS receiver (particularly the upscale car radio) constantly searches for the best signal that carries the very same program. When a better signal is found, the radio re-tunes with no noticeable interruption. The principal utility of this RDS function is with European radio networks and US stations with 'translators.'

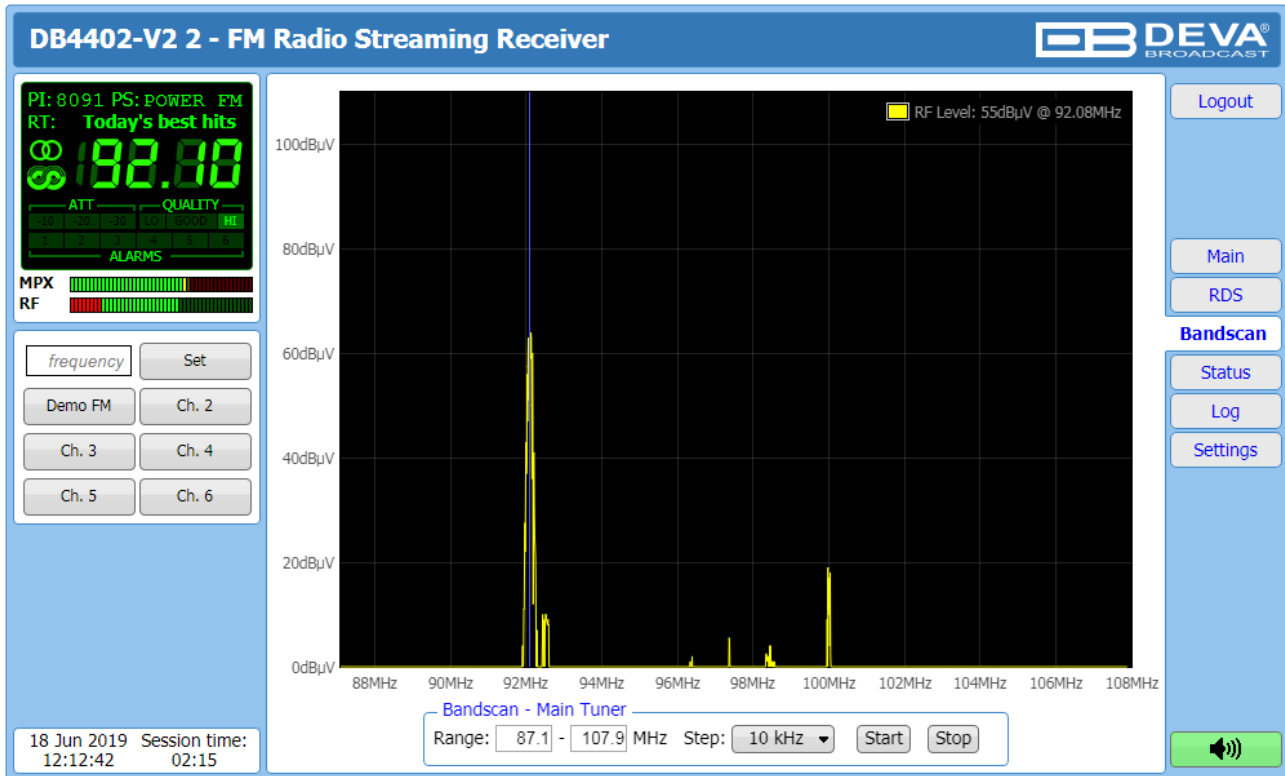
**PIN** - Program Item Number: The code enables the designed to use this feature receivers and recorders to respond to the preselected by the user program item(s). This feature is used via scheduled program time, to which in order to avoid ambiguity is added the day of the month.

**Date and Time** – Decoded CT information.

### Radio Text +

RadioText Plus is “semantic analogue radio”. It allows the RDS feature RadioText (RT) to be read by the FM RDS receiving terminals. Based on the RDS RT messages, RT+ is completely backwards compatible with RT. The usage of RT+ allows the listener/user to derive additional benefits from the RDS Radio Text service. It enables FM RDS receivers to “read” Radio Text (to recognize designated objects and make them manageable) by user’s direct access to specific elements of the Radio Text messages. For example, that element could be programme associated metadata like Title and Artist of the currently playing song or a news headlines. This provides the listener with an “mp3-player feeling” while listening to analogue FM radio. The elements can also carry additional service messages or information about the Radio Station such as the telephone number or the web address of the Radio Station’s hotline. These objects, or more accurately RT+ information elements carried in the RDS RadioText (RT) messages, are identified by their location within the RT messages and by the class code of their content type. Once an information element is received and understood, a receiver is able to, for example, store the different RT+ information elements and the listener may then select and request a specific content type from the radio’s memory at an instant in time that suits the listener’s needs. Thus the listener is no longer forced to watch the RT information passing (scrolling) by. Moreover, RT+ offers selected RT message elements to car drivers on a static display, without risk of distracting the attention of the driver. Furthermore, RT+ is well suited for mobile phones with built-in FM receivers: telephone numbers can be directly used to initiate calls, and web addresses can be used to start browsing the web content offered by the radio programme provider. Last but not least, RT+ is also used for satellite radio broadcasting via DVB-S. It may be adopted by DRM and DAB in the future, too.

## 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 Bandscan application utilizes four different types of Bandscan, depending on the preferred signal frequency step. The bandscanning mode could be customized by setting low and high frequency limits of the scan. Once you have set the frequency step and low/high frequencies, the start button should be pressed in order for the Bandscan process to be initiated. The current scan could be stopped at any time by pressing the [Stop] button.

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

## STATUS

**DB4402-V2 2 - FM Radio Streaming Receiver**

PI: 8091 PS: POWER FM  
RT: Today's I  
**192.00**  
ATT QUALITY  
MPX RF  
ALARMS

**Device**  
Serial: 45DJ414F  
MAC: 00:04:A3:43:9F:F5  
FW: 1.0.1730 2019/06/14  
Temp: 55.0 °C


**Network**  
Type: Assigned by DHCP  
IP: 192.168.1.43  
Netmask: 255.255.255.0  
Gateway: 192.168.1.1  
DNS 1: 192.168.1.1  
DNS 2: 0.0.0.0

**GSM**  
Status: Not present  
Operator:  
BER:  
Signal:

18 Jun 2019 Session time:  
12:14:25 02:57

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.). If a GSM modem is connected, the status of the modem will also be depicted in the relevant section.

## LOG

**DB4402-V2 2 - FM Radio Streaming Receiver**


PI: 8091 PS: POWER FM  
RT: y's best hits  
192.00  
ATT QUALITY  
ALARMS  
MPX RF

frequency Set  
Demo FM Ch. 2  
Ch. 3 Ch. 4  
Ch. 5 Ch. 6


18 Jun 2019 Session time:  
12:16:32 00:49

Clear System Log  
Clear

Reload  
Reload

Logout

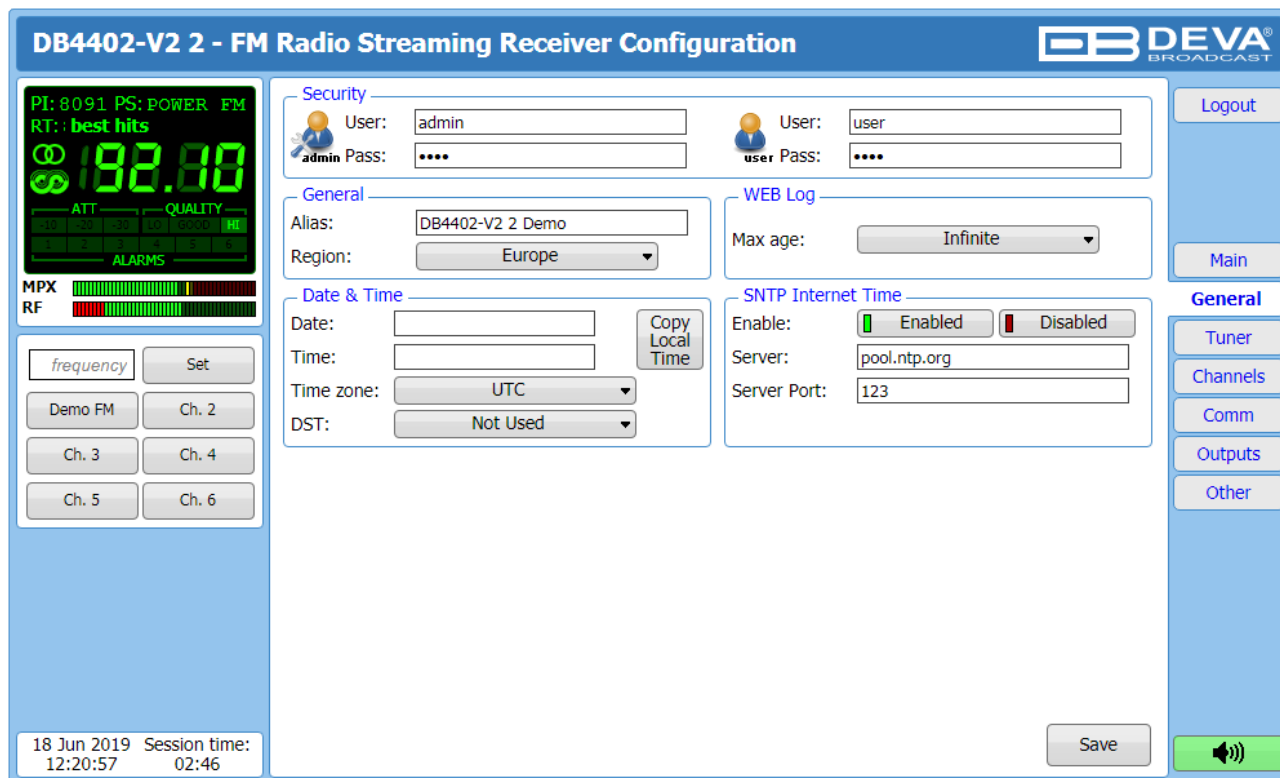
Main  
RDS  
Bandscan  
Status  
**Log**  
Settings



2019-06-14 11:38:27	Control	Channel log suspended, WEB Login
2019-06-14 11:38:37	Control	WEB Logout, 192.168.1.1
2019-06-14 11:38:47	Control	Channel log resumed
2019-06-14 11:41:14	Control	WEB Login, 192.168.1.1, Admin
2019-06-14 11:41:14	Control	Channel log suspended, WEB Login
2019-06-14 11:41:15	Control	WEB Logout, 192.168.1.1
2019-06-14 11:41:25	Control	Channel log resumed
2019-06-18 06:17:01	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 06:17:01	Control	Channel log suspended, WEB Login
2019-06-18 06:20:02	Control	WEB Logout, 192.168.1.1
2019-06-18 06:20:12	Control	Channel log resumed
2019-06-18 06:20:53	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 06:20:53	Control	Channel log suspended, WEB Login
2019-06-18 06:25:27	Control	WEB Logout, 192.168.1.1
2019-06-18 06:25:37	Control	Channel log resumed
2019-06-18 07:03:31	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 07:03:31	Control	Channel log suspended, WEB Login
2019-06-18 07:06:31	Control	WEB Logout, 192.168.1.1
2019-06-18 07:06:41	Control	Channel log resumed
2019-06-18 12:01:10	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 12:01:10	Control	Channel log suspended, WEB Login
2019-06-18 12:09:50	Control	WEB Logout, 192.168.1.1
2019-06-18 12:10:00	Control	Channel log resumed
2019-06-18 12:11:53	Control	WEB Login, 192.168.1.1, Admin
2019-06-18 12:11:53	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 DB4402-V2 and an FTP Client should be configured, please refer to ["Download files via FTP" on page 68](#).

## GENERAL SETTINGS



**DB4402-V2 2 - FM Radio Streaming Receiver Configuration**

**Security**

User: admin Pass: \*\*\*\*

User: user Pass: \*\*\*\*

**General**

Alias: DB4402-V2 2 Demo

Region: Europe

Max age: Infinite

**Date & Time**

Date: Time: Time zone: UTC DST: Not Used

**WEB Log**

Max age: Infinite

**SNTP Internet Time**

Enable: Enabled Disabled

Server: pool.ntp.org

Server Port: 123

18 Jun 2019 Session time: 12:20:57 02:46

Save

DB4402-V2 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.

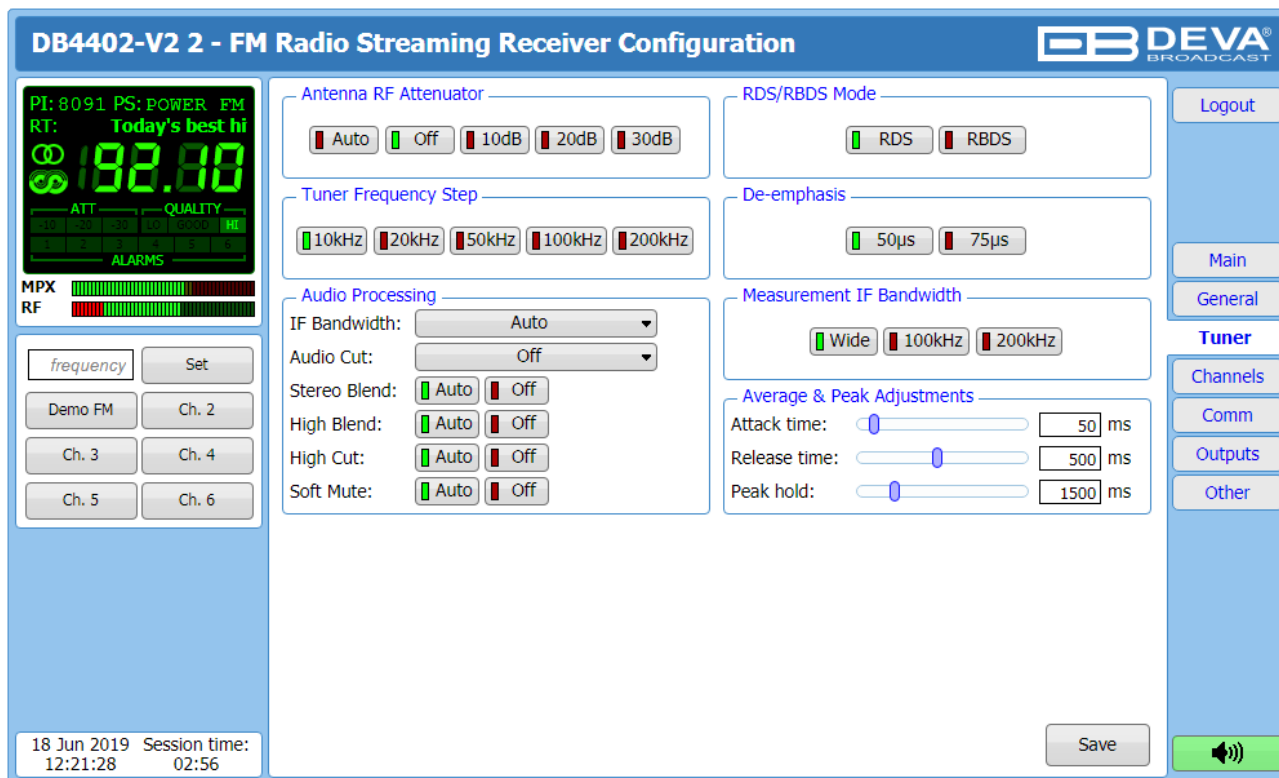
In order for the security of DB4402-V2 to be enhanced, a new **username** and **password** could be set from the Security section. By choice, you can change the name of the device (General section). Later on, it will be used as a title name for all WEB pages. Customizing the name will make the device 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 DB4402-V2 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).

## TUNER SETTINGS



**DB4402-V2 2 - FM Radio Streaming Receiver Configuration**

**Antenna RF Attenuator**: ☐ Auto ☐ Off ☐ 10dB ☐ 20dB ☐ 30dB

**Tuner Frequency Step**: ☐ 10kHz ☐ 20kHz ☐ 50kHz ☐ 100kHz ☐ 200kHz

**RDS/RBDS Mode**: ☐ RDS ☐ RBDS

**De-emphasis**: ☐ 50µs ☐ 75µs

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

**Measurement IF Bandwidth**: ☐ Wide ☐ 100kHz ☐ 200kHz

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

**Save**

The Tuner Section gives full control over Tuner settings.

**Antenna RF Attenuator** – Allows the preferred attenuator value to be set.

**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.

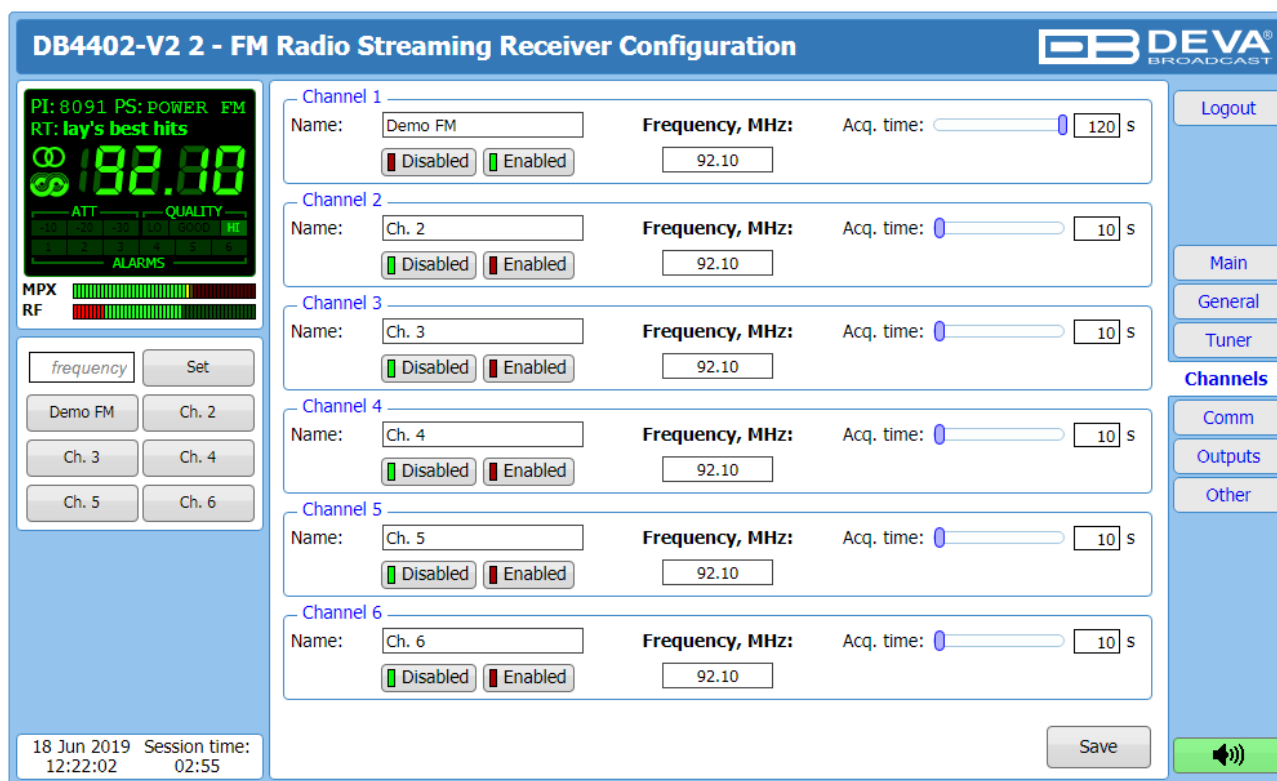
- Stereo Blend – reduces the stereo separation if the received signal is bad;
- High Blend – applies low pass filter to the L-R audio levels;
- High Cut – applies low pass filter to the L+R audio levels;
- Soft Mute – reduces the level of the audio if the RF level is too low.

**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.

## CHANNELS SETTINGS (CHANNELS 1 TO 6)



The DB4402-V2 can monitor up to 6 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 six parameters: RF, Left and Right audio levels, MPX (baseband) deviation, Pilot and RDS/RBDS deviation. Trigger and alarm release times can be set for each alarm.

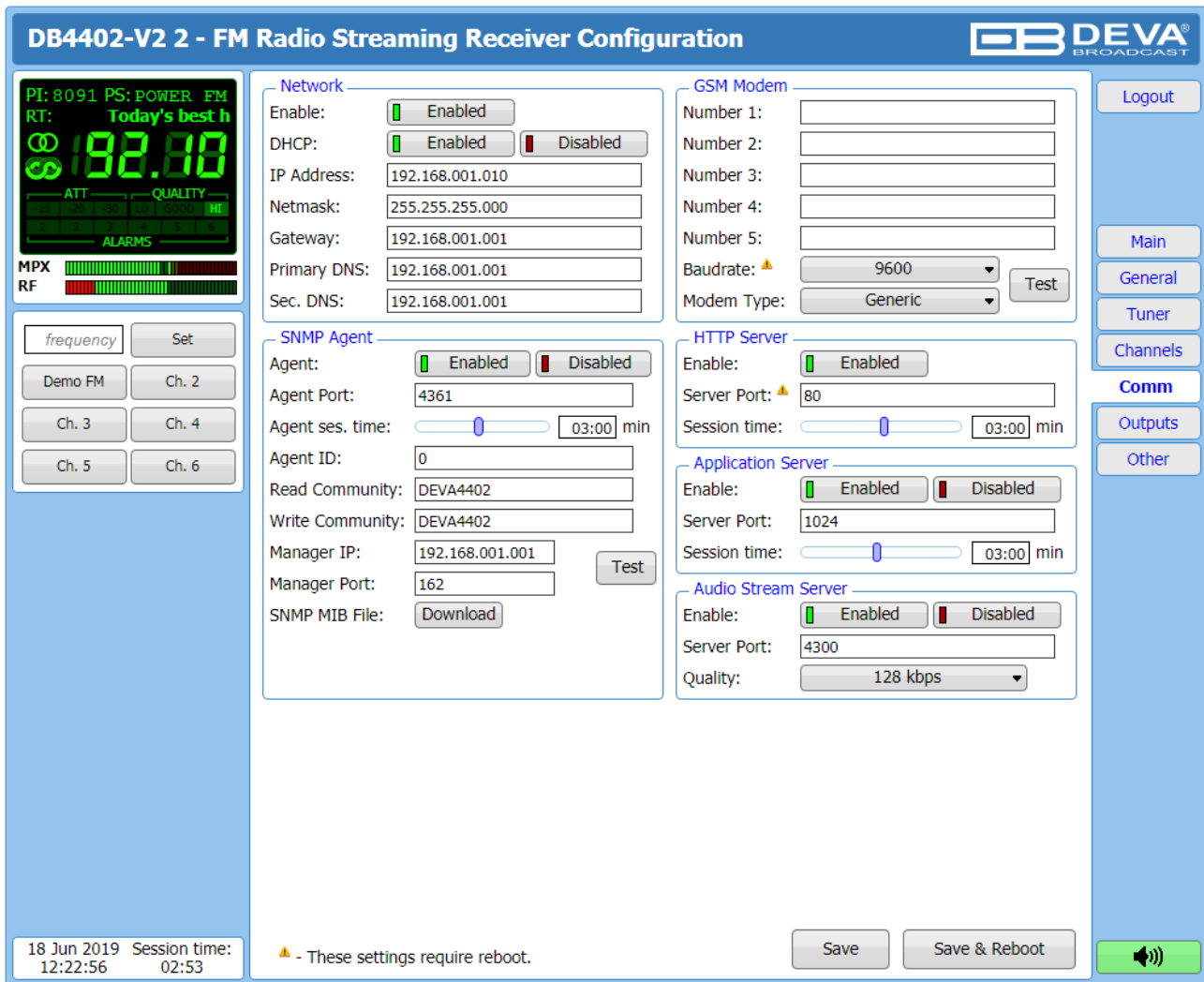
The notification means (Email, SMS, SNMP, GPO) is set for each parameter individually. To enable the notification, press on the relevant button so that it could be illuminated in green.

### Channel

- [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;
- 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).

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

## COMMUNICATION SETTINGS



**DB4402-V2 2 - FM Radio Streaming Receiver Configuration**

**Network**

Enable: ☒ Enabled ☐ Disabled

DHCP: ☒ Enabled ☐ Disabled

IP Address: 192.168.001.010

Netmask: 255.255.255.000

Gateway: 192.168.001.001

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

**HTTP Server**

Enable: ☒ Enabled ☐ Disabled

Server Port: 80

Session time: 03:00 min

**Application Server**

Enable: ☒ Enabled ☐ Disabled

Server Port: 1024

Session time: 03:00 min

**Audio Stream Server**

Enable: ☒ Enabled ☐ Disabled

Server Port: 4300

Quality: 128 kbps

**SNMP Agent**

Agent: ☒ Enabled ☐ Disabled

Agent Port: 4361

Agent ses. time: 03:00 min

Agent ID: 0

Read Community: DEVA4402

Write Community: DEVA4402

Manager IP: 192.168.001.001

Manager Port: 162

SNMP MIB File: Download

**Test**

**Save** **Save & Reboot**

18 Jun 2019 Session time: 12:22:56 02:53

⚠ - These settings require 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, DB4402-V2 will use AutoIP and will generate an IP Address.

### 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:

DB4402-V2 Test Message.

**NOTE:** The current condition of the GSM Modem could be checked in the Status Screen. For detailed explanation of the option, please refer to [“GSM Modem Option” on page 62](#).

### 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.

### Audio Stream Server

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

### SNMP Agent

**Agent** - [Enabled]/[Disabled] the SNMP Agent.

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


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

Press the [Download] button to download the latest available DB4402-V2 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.

## OUTPUTS SETTINGS

DB4402-V2 2 - FM Radio Streaming Receiver Configuration



PI: 8091 PS: POWER FM  
RT: :st hits  
192.00  
ATT QUALITY  
ALARMS  
MPX  
RF


frequency Set  
Demo FM Ch. 2  
Ch. 3 Ch. 4  
Ch. 5 Ch. 6

GSM Audio  
Level:  dB

Headphones Audio  
Level:  dB

Logout  
Main  
General  
Tuner  
Channels  
Comm  
**Outputs**  
Other

Save



18 Jun 2019 Session time:  
12:25:31 02:57

**GSM Audio** – interactive slider used to adjust the Level of the GSM Audio.

**Headphones Audio** – interactive slider used to adjust the Level of the Headphones Audio.

- 57 -

## OTHER SETTINGS

**DB4402-V2 1 - FM Radio Monitoring Receiver Configuration**

PI: 8091 PS: POWER FM  
RT: 192.00  
ATT: [ ] QUALITY: [ ]  
MPX: [ ] RF: [ ]  
ALARMS: [ ]

frequency [ ] Set [ ]  
Demo FM [ ] Ch. 2 [ ]  
Ch. 3 [ ] Ch. 4 [ ]  
Ch. 5 [ ] Ch. 6 [ ]

18 Jun 2019 Session time:  
11:59:12 02:58

**Firmware Update**  
Firmware file: Choose File No file chosen  
Upload  
DSP: 1.0.1730 2019/06/14  
TUN: 1.0.1730 2019/06/14  
LIB: 1.0.1729 2019/06/14

**Storage**  
Used Space: 48.78 MB  
Free Space: 7329.22 MB  
Format

**System Log**  
Clear

**Factory Defaults**  
All except IP

**Reboot Device**  
Reboot

Logout  
Main  
General  
Tuner  
Channel 1  
Channel 2  
Channel 3  
Channel 4  
Channel 5  
Channel 6  
Comm  
Outputs  
Other

### Firmware Update

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

### Storage

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

### System Log

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

### Factory Defaults

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

To restore DB4402-V2 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

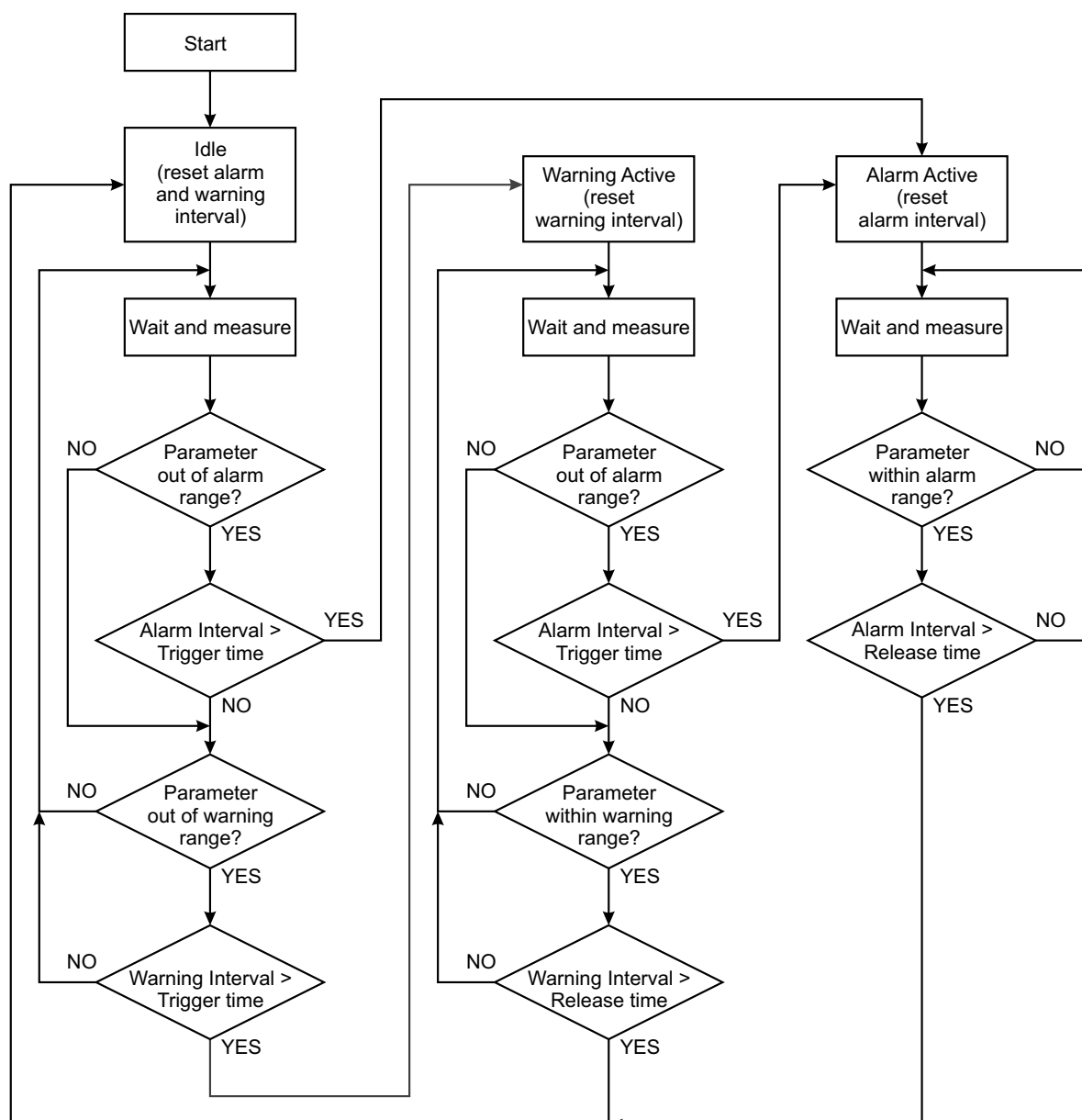
To start Rebooting of DB4402-V2, press the [Reboot] button. A dialog warning window will appear. Confirm that you want to reboot the device and wait for the process to be completed.

## APPENDIX A

### ALARM TRIGGERS

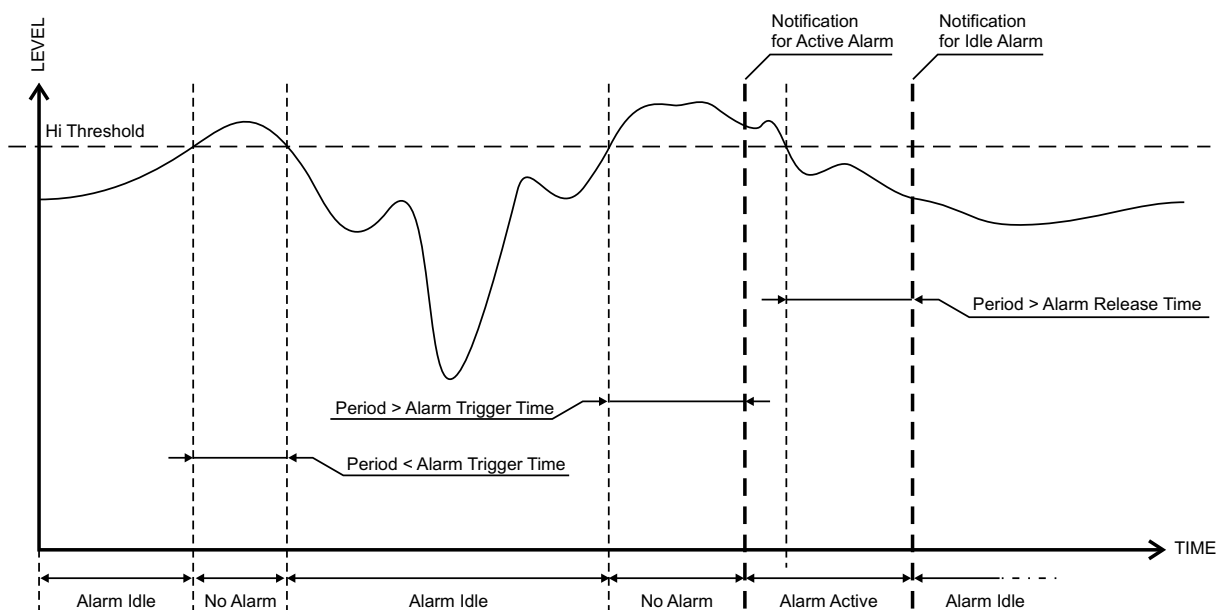
After collecting all the data, the DSP-based core compares the values measured with the predefined by the user threshold levels, for all the parameters monitored. In case that a parameter is beyond limits, the device will initiate the sending of an alarm or warning notification via the selected communication path. All the alarm and warning 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 'trigger time', the device would not trigger an alarm or warning.

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



*Block Diagram of Alarm Automata*

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



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.

## 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

DB4402-V2 reports ACTIVE alarm on 91.10MHz - Power FM (CH1)

Alarm: RDS > 6.5kHz

Signal parameters:

RF: 51.5dBuV

MPX Total: 89.9kHz

MPX Power: -128.0dBr

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\*

MPX:60.3kHz

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 B

### 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
- **DB7000** – FM Radio Re-Broadcast Receiver with Built-in IP Audio & MP3 Backup Players
- **DB7007** – Advanced FM Radio Re-Broadcast Receiver with IP Audio & MP3 Backup Players
- **DB4402-V2** – High-Performance Dual FM Monitoring Receiver & Radio Streamer

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](http://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
- **DB7000** – FM Radio Re-Broadcast Receiver with Built-in IP Audio & MP3 Backup Players
- **DB7007** – Advanced FM Radio Re-Broadcast Receiver with IP Audio & MP3 Backup Players
- **DB4402-V2** – High-Performance Dual FM Monitoring Receiver & Radio Streamer

### 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/](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 C

### 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

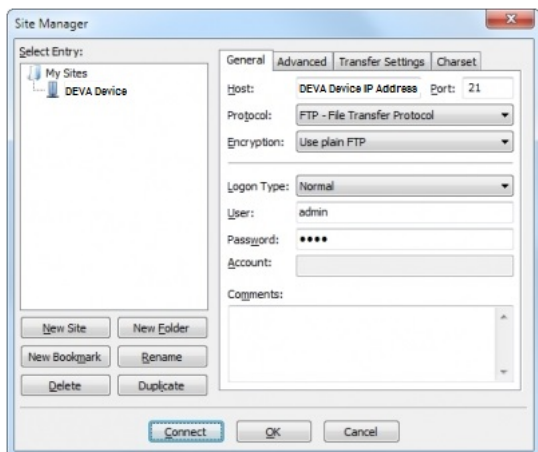
If the connection to the device is made through a Network address translation (NAT) router or firewall, the port forwarding feature of the router should be configured. The port forwarding is usually set in the firewall section of the router's menu. As each router has different port forwarding procedure,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

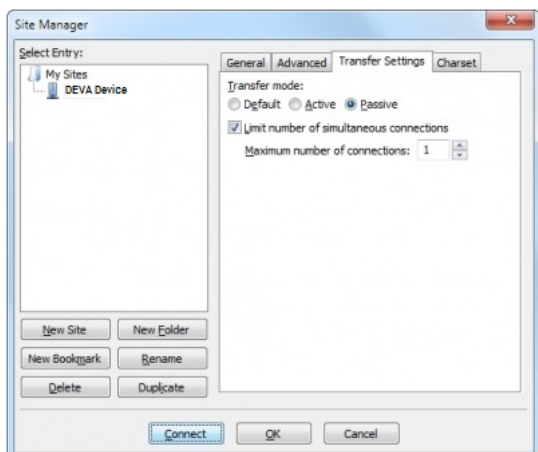
### 3. Example of FTP Client (FileZilla) Settings

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:



## 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 supplied with this product must be completed and returned to DEVA Broadcast Ltd. 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 delivery 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 calling the factory. The number should be prominently marked on the outside of the shipping carton.

**B.** Equipment must be shipped prepaid to DEVA Broadcast Ltd. Shipping charges will be reimbursed for valid Warranty claims. 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.

## 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.**