

MAINTENANCE AND OPERATION
INSTRUCTION MANUAL

DB64-FM

FM Radio 4-Band Broadcast Audio Processor
with RDS/RBDS Encoder



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Introduction

DEVA Broadcast Ltd. is an international communications and high-technology manufacturing organization, its corporate headquarters and facility located in Burgas, Bulgaria. The company serves the broadcast and corporate markets worldwide – from consumers and small businesses to the largest global organizations. It is dedicated to the research, design, development and provision of advanced products, systems and services. DEVA 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

This manual uses the following typographic conventions:

Style	Used for
NOTE	Important notes and recommendations
Example	Used when example text is cited
0 dB	Menu element value
<u>“Menu” on page XX.</u>	References
[OK]	Front panel navigation and soft buttons. WEB Interface interactive buttons.
<i>Settings</i>	Menu element and soft button name. Menu path are represented as follows: <i>Settings> Security> Front Panel> Access control</i>

General Information

The DB64-FM is the ultimate audio processing solution offered by DEVA bringing to you unheard-of balance between quality and price. It guarantees perfect clarity of sound and a multitude of features that are unrivalled in its class. In keeping with the other members of DEVA's audio processors family, this device is an outstanding blend between dependability and functionality. The all-digital DSP-based design, the 4-band processor and the advanced wide band AGC are just a few of the parameters that ensure its top performance.

As part of its long and well-established tradition of occupying just the right market niches and supplying the broadcasting world with products that stand out as the best answer to customer needs, DEVA is yet again delivering a tool of undisputed quality and surpassing even its own high standards. A device appropriate for all LPFMs and featuring a 4-band stereo generator with Fidelity and Sound Impact System, the DB64-FM makes no compromises with sound quality. Among its wide variety of features are the FM controlled distortion limiter, the analog and digital audio outputs, two independent composite MPX outputs, as well as its ability to detect signal loss and switch over to a backup source. Automatic notifications are sent upon input or preset change via e-mail or SNMP.

As any other DEVA product, with this one our engineers have also opted for the user-friendly design and operation. Parameters can be easily viewed on the OLED display with the help of the full-time LED meters. Access to setting up, programming and control of the device is provided through the front panel, but also through the built-in web server for remote control via TCP/IP connection.

The DB64-FM is a one-of-a-kind device that has never before been introduced to the broadcasting market - a tool with an impressive all-round performance that provides the ultimate combination of features at a sensational price. Quality has never before been so affordable.

Product Features

- Ultra low latency, all-digital DSP based design
- Advanced Wide Band AGC
- FM Controlled distortion Limiter
- 4-Band Dynamic Processor with Fidelity and Sound Impact System
- L/R Analog inputs and outputs and two independent Composite MPX outputs.
- Integrated digital stereo generator with advanced peak control
- Built-in web server for remote control access via TCP/IP connection
- Software Control (over local network or the Internet using any Windows® PC)
- Built in DSP-based RDS/RBDS encoder
- Bright, wide view angle OLED and full-time LED meters
- Easy setup and control via the front panel
- Remotely upgradable firmware to ensure improved operation
- Headphone output with front panel level control
- Intelligent Silence Detector
- Fallback function in case of Audio Loss
- EMI-suppressed XLR connectors
- Stereo encoder integrated with audio processing
- Bypass and Test tone Mode
- Embedded SNMP agent permitting full device management
- Easy to use WEB interface
- SNTP for automatic synchronization of the built-in clock
- Notifications on input/preset change via E-mail and SNMP
- Professional AES/EBU, SPDIF and Optical Digital audio inputs
- Level Adjustable, Balanced Analog and Digital Audio Outputs
- LAN port for full TCP/IP remote control and monitoring
- USB communication interface for local connectivity
- Easy Installation and Setup
- 19" Professional Case for high RF immunity

TECHNICAL SPECIFICATIONS

ANALOG AUDIO INPUT	
Connectors	Main - Two XLR, EMI suppressed, electronically balanced; Auxiliary - DB9, EMI suppressed, electronically balanced
Configuration	Stereo
Input level (0 dBFS)	Software selectable -8 dBu to +24 dBu peak
Impedance	Jumper selectable 600Ω / >10kΩ
A/D Conversion	24 bit; 48 kHz sample rate; Differential inputs
ANALOG AUDIO OUTPUT	
Connectors	Two XLR, EMI suppressed, electronically balanced
Configuration	Stereo. Software selectable flat, pre-emphasized or de-emphasized
Output Level (0 dBFS)	Software selectable -12 dBu to +24 dBu peak into $\geq 600\Omega$ load
Source Impedance	20Ω
Load Impedance	$\geq 600\Omega$, balanced/unbalanced
Signal-to-Noise	≥ 110 dB unweighted (Bypass mode, digital input, flat, 20Hz-15kHz bandwidth, referenced to +12 dBu output level)
Distortion	≤ 0.01 THDN (Bypass mode, digital input, flat, 20Hz-15kHz bandwidth, referenced to +12 dBu output level)
D/A Conversion	24 bit; 192 kHz sample rate; Differential outputs
DIGITAL AUDIO INPUT	
Connectors	Main - XLR, EMI suppressed, transformer balanced and floating; 110Ω impedance; Auxiliary - DB9, EMI suppressed, transformer balanced and floating; 110Ω impedance
Configuration	Stereo AES3 standard, up to 24 bit resolution
Sampling Rate	22 kHz to 192 kHz
Input Gain	-20 dB to 20 dB, referenced to 0 dBFS, software selectable
DIGITAL AUDIO OUTPUT	
Connector	XLR, EMI suppressed, transformer balanced and floating; 110Ω impedance
Configuration	Stereo AES3 standard, 24 bit resolution. Software selectable flat, pre-emphasized or de-emphasized
Sample Rate	Internal - 32, 44.1, 48, 88.2, 96, 176.4, 192 kHz. Externally synced to Main AES3 digital input at 32 to 192 kHz. Software selectable.
Word Length	24 bit
Output Reference Level	-20 to 0 dBFS software selectable

COMPOSITE BASEBAND OUTPUT	
Connectors	BNC unbalanced, chassis floating, EMI suppressed
Configuration	Two outputs. Independent level control. MPX+MPX, MPX+PILOT or BYPASS mode
Source impedance	75Ω
Load impedance	50Ω or greater
Output level	-18dBu to +18dBu
Pilot level	0% to 15%
D/A conversion	24 bit, differential
SNR	>80 dB (Bypass mode, flat, 20Hz - 15kHz bandwidth, Digital input referenced to -10dBFS, unweighted)
THD	< 0.01% (Bypass mode, flat, 20Hz - 15kHz bandwidth, Digital input referenced to -10dBFS, unweighted)
Stereo Separation	>60dB
Crosstalk	>70dB
Pilot protection	>90dB relative to 9% pilot injection, ±250 Hz
38 kHz suppression	>80dB (referenced to 100% modulation)
REMOTE ACCESS INTERFACE	
Configuration	TCP/IP via USB or Ethernet interface
USB Connector	USB type B connector
Ethernet Connector	Female RJ45 shielded connector for 10/100 Mbps CAT5 ethernet networks
REMOTE CONTROL INTERFACE (GPI)	
Connector	DB-9 male
Configuration	Eight LED optocoupler, current limited cathode inputs. Anodes are connected to VCC internally.
Control	Selects corresponding user preset if connected to GND
POWER	
Voltage	100-240 VAC, 50-60 Hz, 30VA
Connector	IEC, Fused and EMI-suppressed. Detachable 3-wire power cord supplied
ENVIRONMENTAL	
Operating Temperature	0° to 50°C / 32° to 122°F
Humidity	0–95% RH, non-condensing
SIZE AND WEIGHT	
Dimensions (W;H;D)	483 x 44 x 180 mm / 19 x 1.875 x 7"
Shipping Weight	540 x 115 x 300 mm / 2.6kg

Front Panel

OLED DISPLAY



DB64-FM has easy to read, high-resolution OLED graphical display that visualizes all measurements of the received signal and DB64-FM's settings.

LED METERS



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

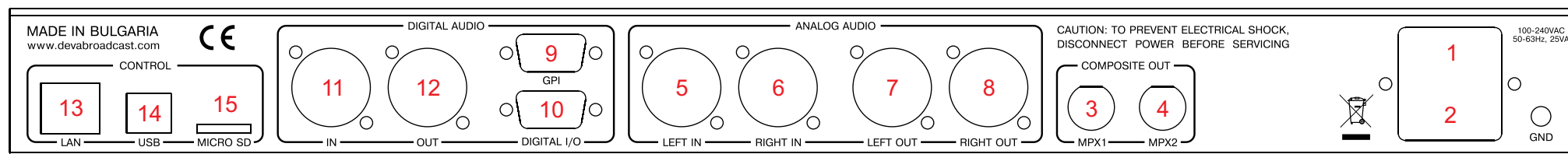
CONTEXT-SENSITIVE SOFT BUTTONS

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

NAVIGATIONAL BUTTONS

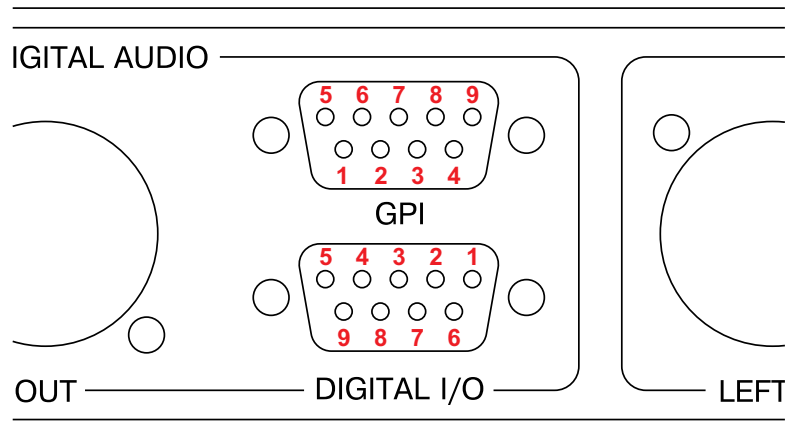
[UP], [DOWN], [LEFT], [RIGHT] and [OK] buttons, as the Soft Buttons, are used to navigate through the menus selecting various functions and parameters of DB64-FM.

REAR PANEL



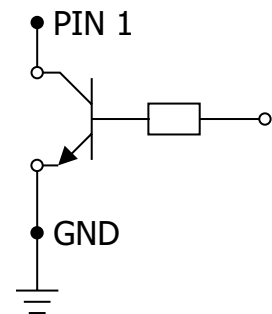
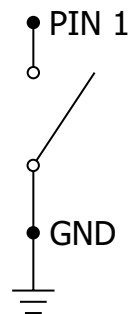
1. Mains connector, 100-240 VAC, 50-60 Hz, 30VA, IEC-320 C14 type, EMI-suppressed;
2. Fuse holder;
3. MPX Output 1 - BNC;
4. MPX Output 2 - BNC;
5. Analog Audio Left Input - XLR;
6. Analog Audio Right Input - XLR;
7. Analog Audio Left Output - XLR;
8. Analog Audio Right Output - XLR;
9. GPI
10. DIGITAL I/O
11. Digital Audio Input - XLR;
12. Digital Audio Output - XLR;
13. Ethernet T-BASE10/100 - RJ45;
14. USB – type B;
15. MICRO SD

REAR PANEL ALARM TERMINAL



GPI Trigger Input Pins

Trigger Input Pin	User Preset Number
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8



NOTE: Pin 9 is connected to GND.

Digital I/O Pins

Pin	Signal
1	Right Aux In - positive
2	Right Aux In - negative
3	Right Aux In - GND
7	Left Aux In - positive
8	Left Aux In - negative
6	Left Aux In - GND
4	Digital Aux In - positive
5	Digital Aux In - negative
9	Digital Aux In - GND

Before you start

SAFETY WARNING

- The servicing of electronic equipment should be performed only by qualified personnel;
- Before removing the covers DB64-FM must be switched off and the mains cable unplugged;
- When the equipment is open, the power supply capacitors should be discharged using a suitable resistor;
- Never touch the wires or the electrical circuits;
- Use insulated tools only;
- Never touch the metal semiconductor. They might carry high voltages;
- For removing and installing electronic components, follow the recommendations for handling MOS components.

ATTENTION: DB64-FM has an internal Lithium battery. Do not try to re-charge this battery!
Please contact us for detailed instructions in case the battery should be changed.

OPERATING RECOMMENDATIONS

For normal operation of DB64-FM, we recommend following the instructions listed below.

- Install the unit in places with good air conditioning. DB64-FM is designed to operate within the ambient temperature range of 10° to 50°C. The equipment rack should be ventilated in order for the device to keep its internal temperature below the maximum ambient temperatures;
- We do not recommend installation in rooms with high humidity, dusty places or other aggressive conditions;
- Locate the device away from abnormally high RF fields;
- Use only checked power supply cables. We strongly recommend the usage of shielded cables;
- Connect DB64-FM only to reliable power supply sources. In case of unstable power supply, please use Uninterruptible Power Supply (UPS);
- Use the device only with its top cover on to avoid electromagnetic anomalies. Otherwise, this may cause problems with the normal functionality of the unit;
- For the normal remote operation of the unit, connect DB64-FM to a good quality Internet connection;
- For the normal operation of DB64-FM, check if the network settings past through all the required data traffic.

UNPACKING AND INSPECTION

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

IT IS VERY IMPORTANT that the [“Product Registration Card” on page 67](#) included in the Manual be completed accurately and returned. This will assure coverage of the terms of the Warranty and it will provide a means of trace in case of lost or stolen equipment. In addition, the user will automatically receive SERVICE OR MODIFICATION INSTRUCTIONS from DEVA Broadcast Ltd.

RADIO FREQUENCY INTERFERENCE (RFI)

Although we have made provision for DB64-FM installation in the immediate proximity of broadcast transmitters, please do practice some care using the unit near abnormally high RF fields.

Mounting

RACK REQUIREMENTS

The DB64-FM mounts in a standard 19-inch equipment rack and requires only 1¾ inches (1U) of vertical rack space. In order the painted finish around the mounting holes to be protected, the use of plastic washers is recommended.

HEAT DISSIPATION

Having very low electricity consumption, the DB64-FM itself generates negligible heat. The unit is intended for operation within an ambient temperature range, extending from freezing to 120°F/50°C. But because adjacent, less efficient equipment may radiate substantial heat, be sure that the equipment rack is adequately ventilated to keep its internal temperature below the specified maximum ambient.

AC Mains Power

FUSE HOLDER

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

MAINS VOLTAGE SELECTOR

Before connecting the AC Power, make sure that the internal Power Switch and the fuse rating are in accordance with the mains supply at your location.

DB64-FM Power Supply Factory Settings are:

- 100 - 240 VAC
- 1 Amp Fuse

CAUTION: Permanent damage will result if improper AC supply voltage is applied to DB64-FM device. Your warranty does not cover damages caused by applying improper supply voltage, or use of an improper fuse.

POWER CORD

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

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

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

GROUND LOOPS

Because the unbalanced MPX OUTPUTS of the DB64-FM are chassis-ground-referenced, a mains frequency or RF ground loop could be formed between the input or output cable shield grounds and the AC power cord ground. A 'ground-lifting' AC adapter may well remedy such a situation, although the chassis somehow must be returned to earth ground for safety. Generally, being screwed-down in the equipment rack will satisfy the safety requirement.

DB64-FM Location

The best location for DB64-FM is as near as possible to the transmitter, so that its stereo encoder output can be linked to the transmitter through a circuit path. It is mandatory that the cable used for connection between DB64-FM's MPX output, and the MPX input of the transmitter be as short as possible. This will prevent any face distortion. If this configuration is not possible, the DB64-FM's AES3 digital audio output can be fed through an all-digital, uncompressed path to the transmitter exciter.

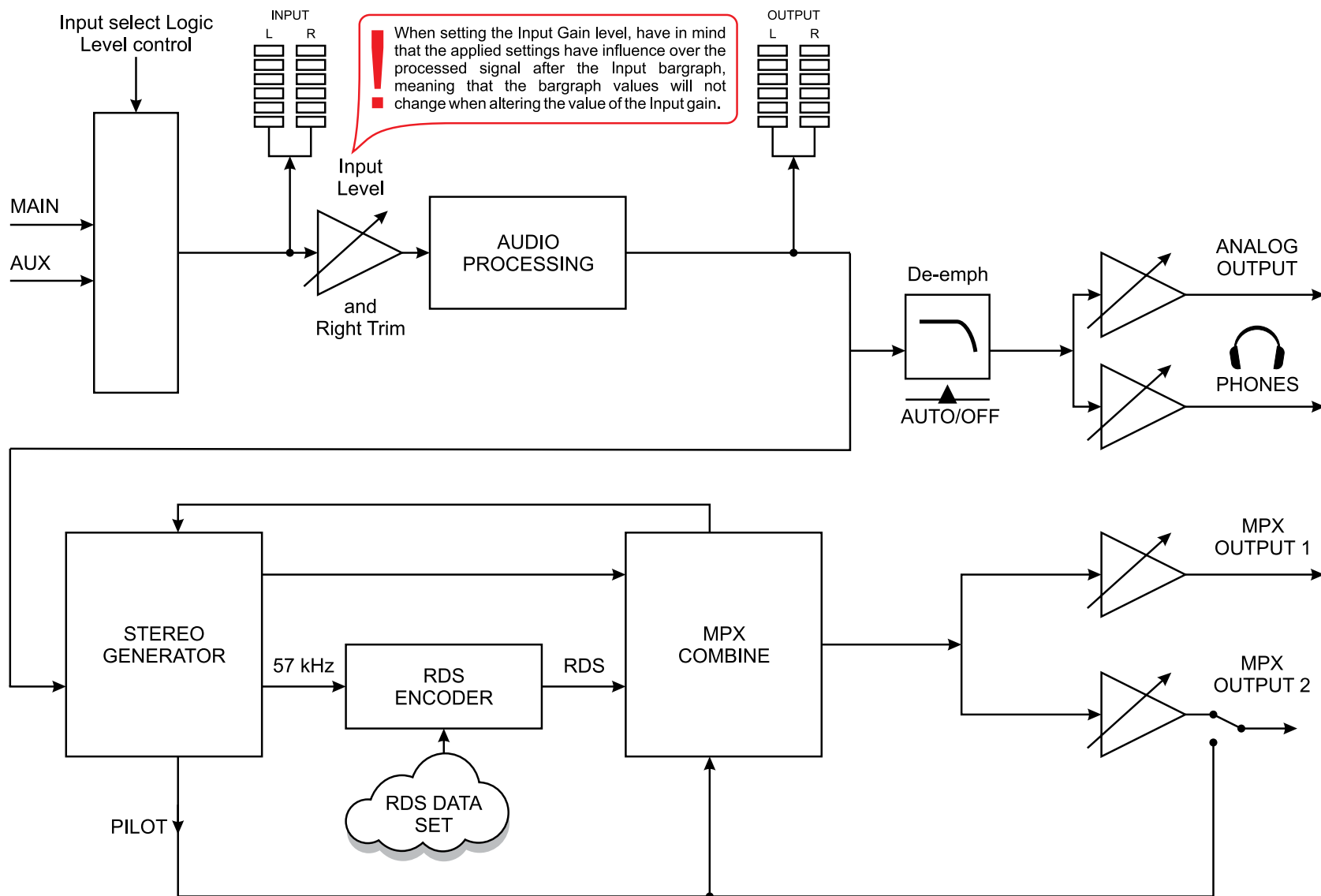
The usage of left and right analog audio outputs is recommended in the situations when the stereo encoder and exciter are under the jurisdiction of an independent transmission authority, and the programming agency's jurisdiction ends at the interface between the audio facility and the link connecting the audio facility to the transmitter. (The link might be telephone / post lines, analog microwave radio, or various types of digital paths.)

Source Material Quality

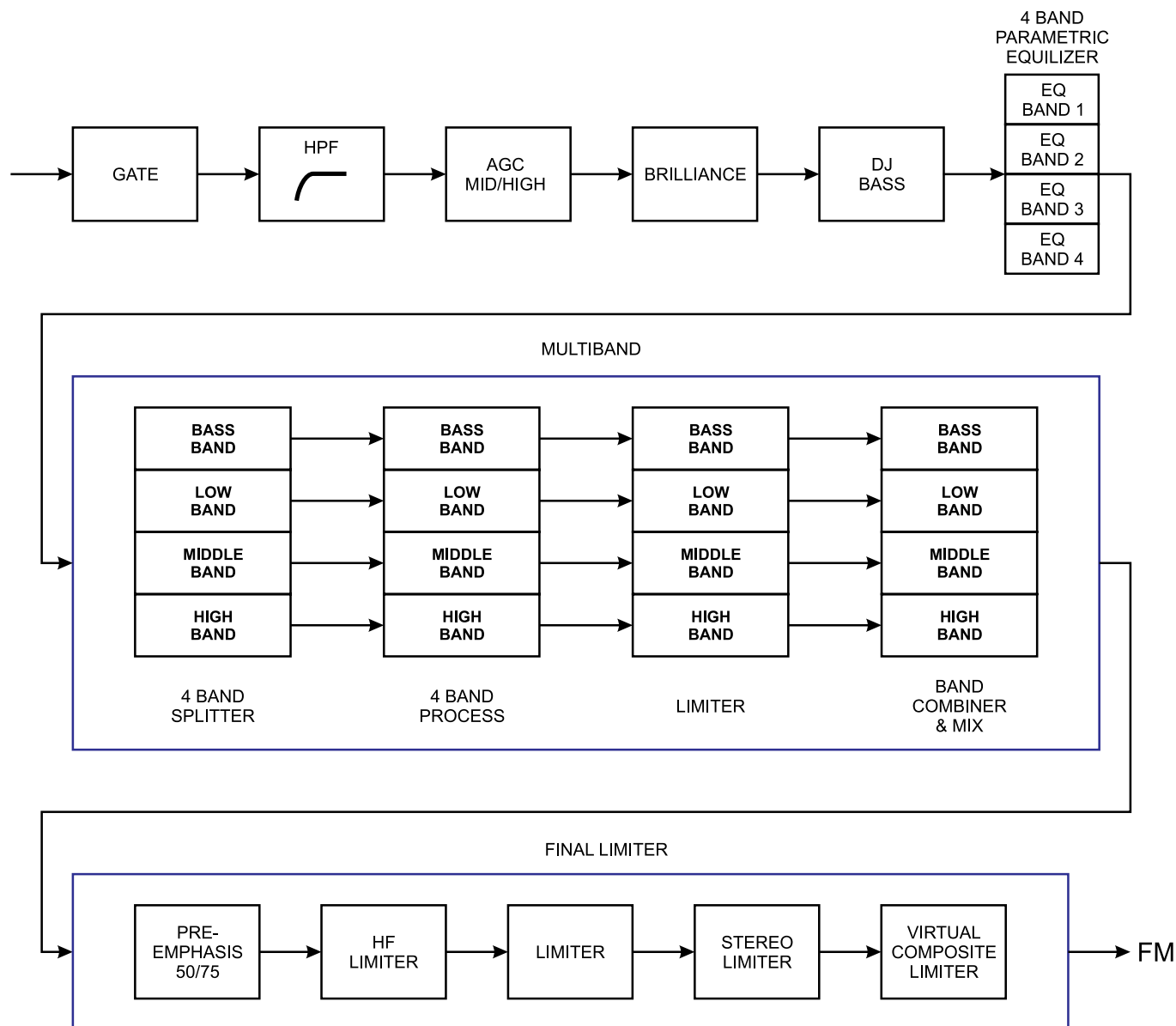
The DB64-FM is designed to achieve perfect sound quality, regardless of the source material. Though, it is very important that the source audio to be as clean as possible, as upon processing the poor-quality source material will cause distortion and unpleasant audio defects.

Operation

PROCESSING PATH



AUDIO PROCESSING EXPLAINED



Basic Setup/Connection Example

REFERENCING ANALOG AND DIGITAL INPUTS LEVEL

In order for the proper work of DB64-FM to be guaranteed, and due to the variability of the signal levels, the right reference levels of the digital and analog inputs should be set.

The process of aligning the signal levels to the needed boundaries is called referencing inputs. The Reference level is specified depending on the intended source device and typical program material fed at the input.

The Reference level (Ref. level) represents the amplitude of the input signal applied at DB64-FM's analog input, which after ADC (analog-to-digital converter) will be considered as 0dBFS. The set Ref. Level value must be conformable to all operating conditions, as the level of the analog program material at the input should not be higher than that. Setting Reference level that is unnecessarily high may affect the dynamic range of the input and to increase the noise level.

Depending on the dynamics of the audio program, fed at the input, we recommend the Ref. Level set to have headroom from 4dBu to 12dBu above the audio program. For example:

Audio program level at the input: 6dBu

Headroom: 10dBu

Ref. Level to be set: 16dBu = 6dBu + 10dBu

In case of sudden amplitude transients or unanticipated loud events in the program, the material reserve guarantees that the signal will not be clipped.

For the analog inputs the reference level is set in the **Input>Analog Main Level** and **Input>Analog Aux Level**. The reference level that could be set is between **-8dBu** to **+24dBu**.

As a general rule, when the Ref. level is properly selected, DB64-FM's front panel AGC indicator should vary from +10/-10 during continuous operation.

If AGC indicator is constantly at its lowest value, the set Ref. Level should be increased. If the maximum possible value of **24dBu** is met, the level of the audio program fed at DB64-FM's analog input should be reduced.

If the AGC indicator is constantly at its highest value- the Ref. Level should be reduced. If the minimum value of **-8dBu** is met, the level of the audio program at the input increased.

DB64-FM digital inputs have pre-defined reference level of 0dBFS, but in order for the signal to be reduced or increased to values guaranteeing the best performance of the audio processor, user defined values of the main and auxiliary digital inputs could be set. The preferred levels are set in the **Input> Digital Main Level** and **Input>Digital Aux Level**.

Please have in mind that when applying these settings, if need be, the signal received from the corresponding digital input can be amplified. The excessive increase, however, can lead to unwanted signal clipping.

IT IS VERY IMPORTANT the signal fed at the any input of DB64-FM not to exceed the specified reference level, otherwise it will cause clipping, distortion and unpleasant audio defects.

REFERENCING ANALOG AND DIGITAL OUTPUTS LEVEL

These settings define the value of 0 dBFS when converted to dBu. Similarly to the input Ref. Level, the output Ref. Level determines the amplitude of the respective output, which corresponds to 0dBFS. The value is set depending on the level requirements of the device connected to DB64-FM's digital output. Having the proper Ref. level set at the output of the audio processor, guarantees that the signal amplitude at the input of the subsequently connected device will be within the required optimal range. As a general rule, the amplitude of any of DB64-FM's outputs cannot exceed the Ref. Level set for this output.

For the analog output, the Ref. Level could be set in the range of **-12dBu** to **+24dBu** with **0.5dB** step. For the MPX outputs, the Ref. Level is set in the range of **-18dBu** to **+18dBu** with **0.1dB** step.

For the digital output, the Ref. Level is set in the range of **-20dBFS** to **0dBFS** with **0.5dB** step. The preferred output values could be applied via the:

Outputs> Analog Out Level,

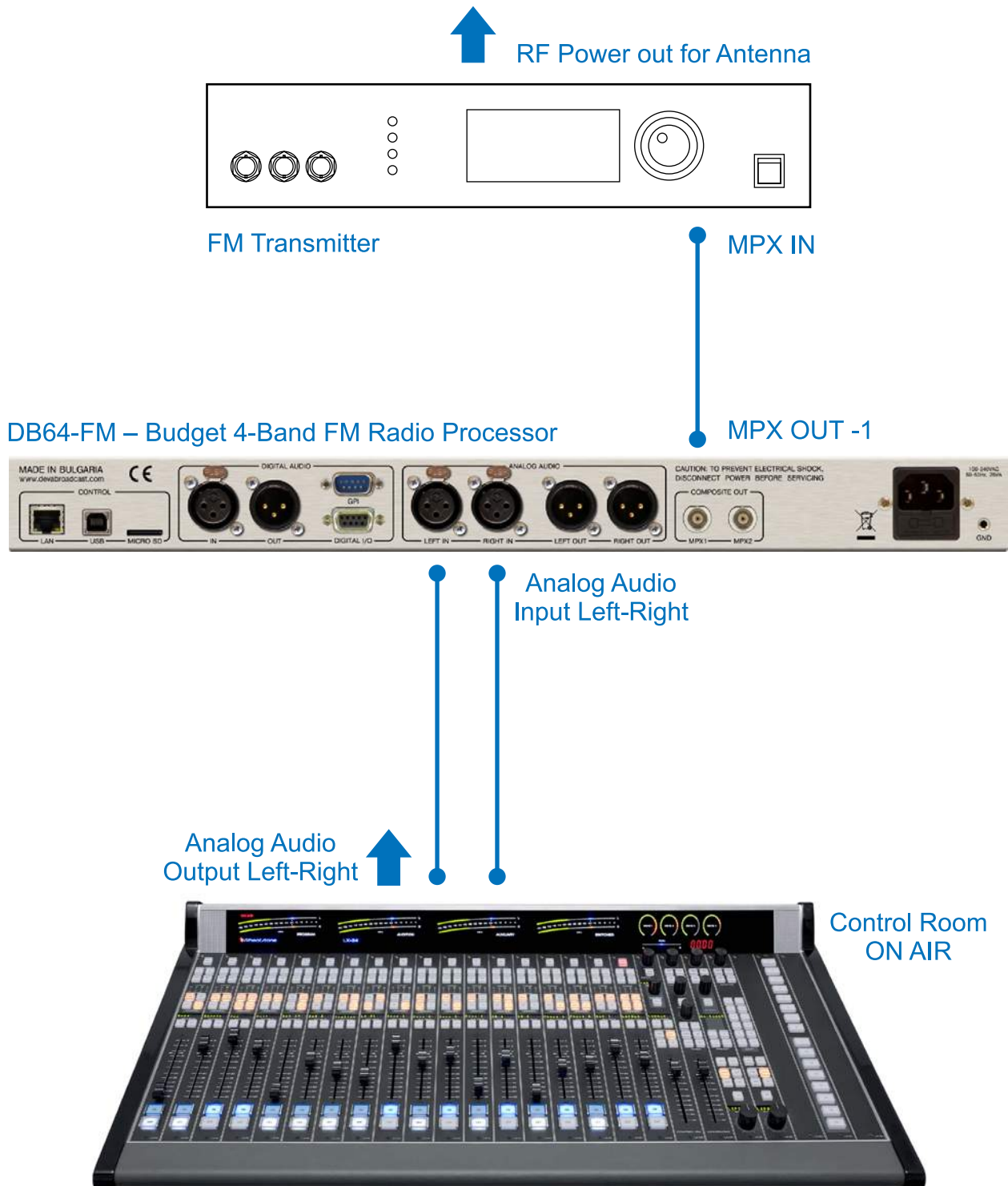
Outputs> Digital Out Level,

Outputs> MPX 1 Out Level,

Outputs> MPX 2 Out Level.

SETUP WITH ANALOG PROGRAM INPUTS

DB64-FM is fed with analog audio. The main program output is sent to the DB64-FM Audio Processor via XLR Connection. The MPX composite output is sent via BNC connection to the transmitter's MPX input. The audio processor output used is MPX OUT -1.

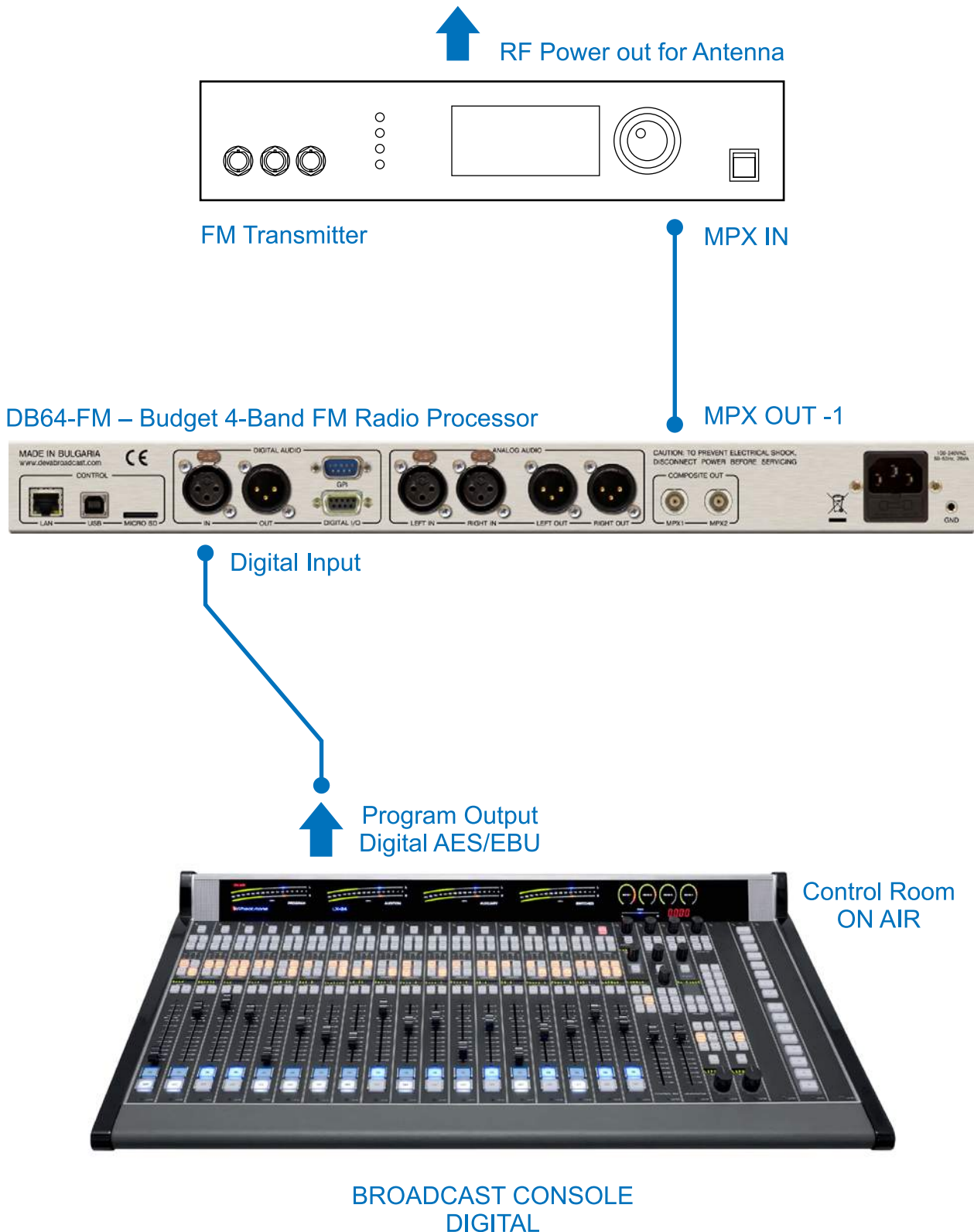


BROADCAST CONSOLE

IMPORTANT RECOMMENDATION: It is mandatory that the cable used for connection between DB64-FM's MPX output, and the MPX input of the transmitter be as short as possible. This will prevent any face distortion.

SETUP WITH DIGITAL PROGRAM INPUTS

DB64-FM is fed with AES/EBU digital audio. The main program output is sent to the DB64-FM Audio Processor via XLR Connection. The MPX composite output is sent via BNC connection to the transmitter's MPX input. The audio processor output used is MPX OUT -1.



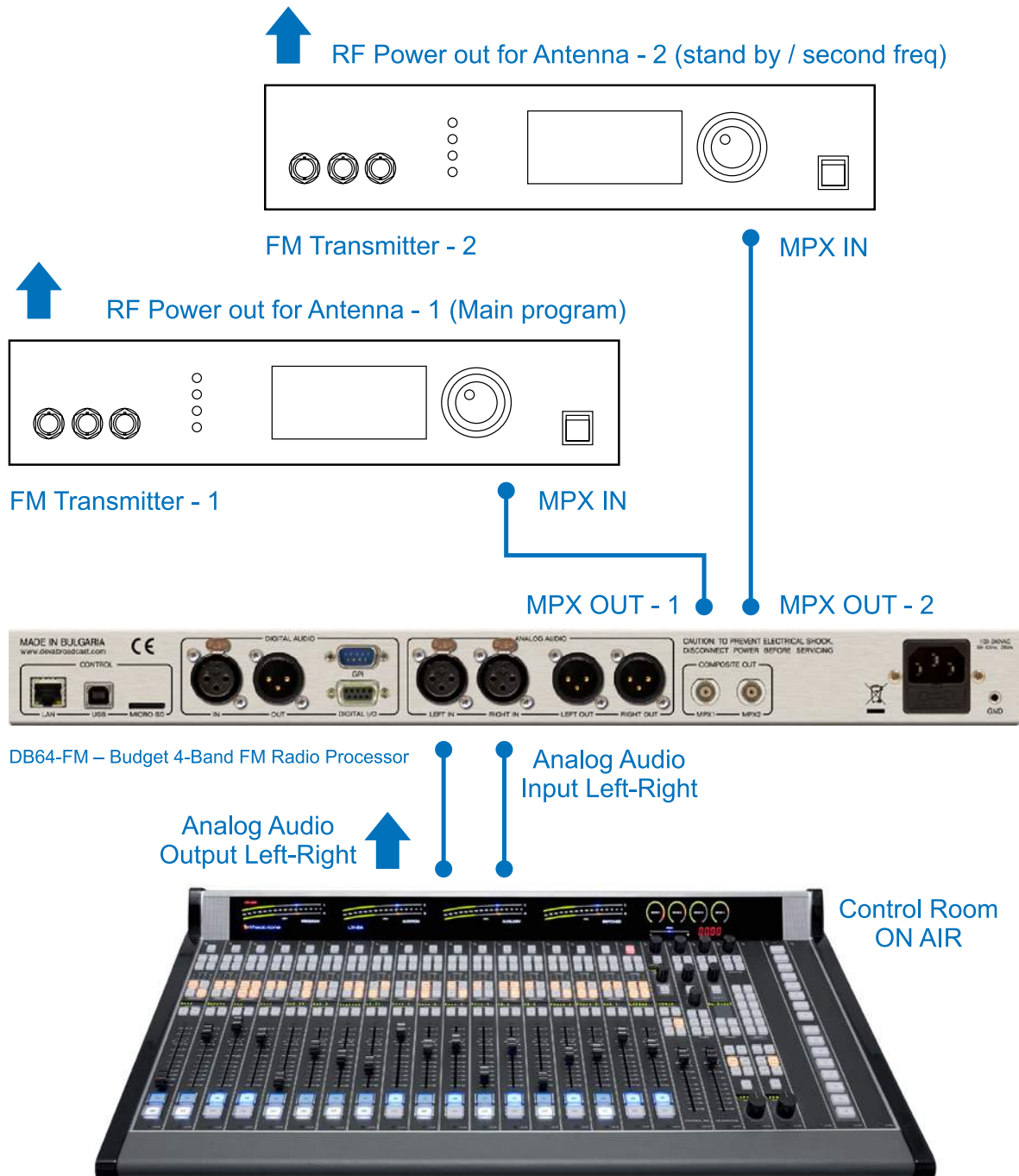
IMPORTANT RECOMMENDATION: It is mandatory that the cable used for connection between DB64-FM's MPX output, and the MPX input of the transmitter be as short as possible. This will prevent any face distortion.

ANALOG CONNECTION WITH TWO TRANSMITTERS

Possible configurations:

- Program transmitter and second standby transmitter;
- Two program transmitters broadcasting on different frequencies via analog audio connection.

The main program output is sent to the DB64-FM via XLR connector. The MPX composite output is sent via BNC connection to the transmitter's MPX input. The audio processor's outputs used are MPX OUTPUT – 1 (for the main program) and MPX OUTPUT – 2 (for the standby/second frequency).



BROADCAST CONSOLE

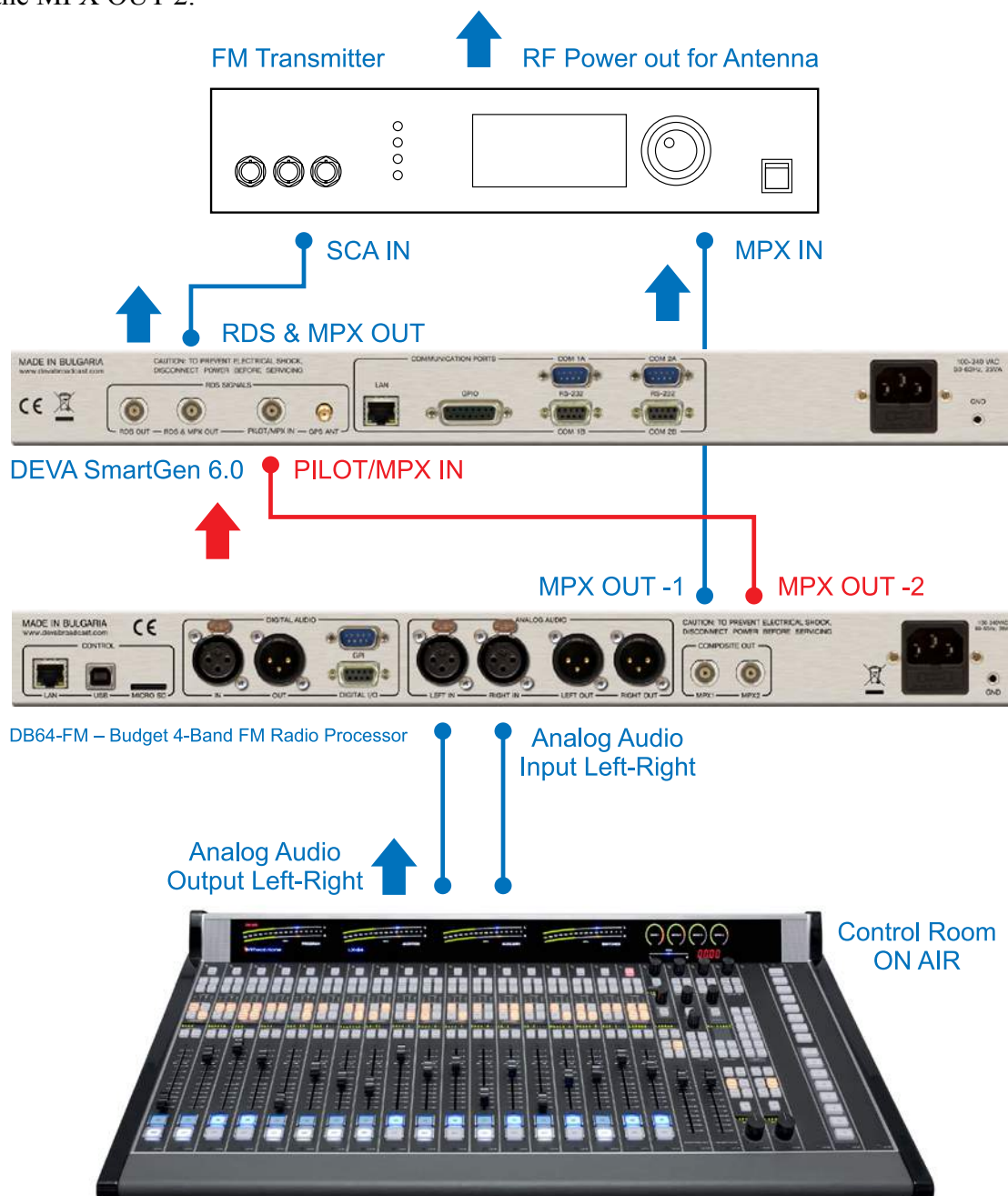
IMPORTANT RECOMMENDATION: It is mandatory that the cable used for connection between DB64-FM's MPX output, and the MPX input of the transmitter be as short as possible. This will prevent any face distortion.

ANALOG CONNECTION WITH DEVA SMARTGEN 6.0

The DB64-FM has built in basic RDS/RBDS Encoder, in case additional RDS/RBDS Encoder is added, a “Loop Through” and “Side-chain” connection with the audio processor can be made.

Side-chain

Side-chain – the RDS& MPX output is sent to the Input SCA input, while to provide the RDS encoder with a Sync signal for the 19 kHz pilot tone, the entire program can be taken out via MPX OUT-2. Make sure that you will not send the same signal as the one generated by the RDS encoder to the MPX OUT-2.

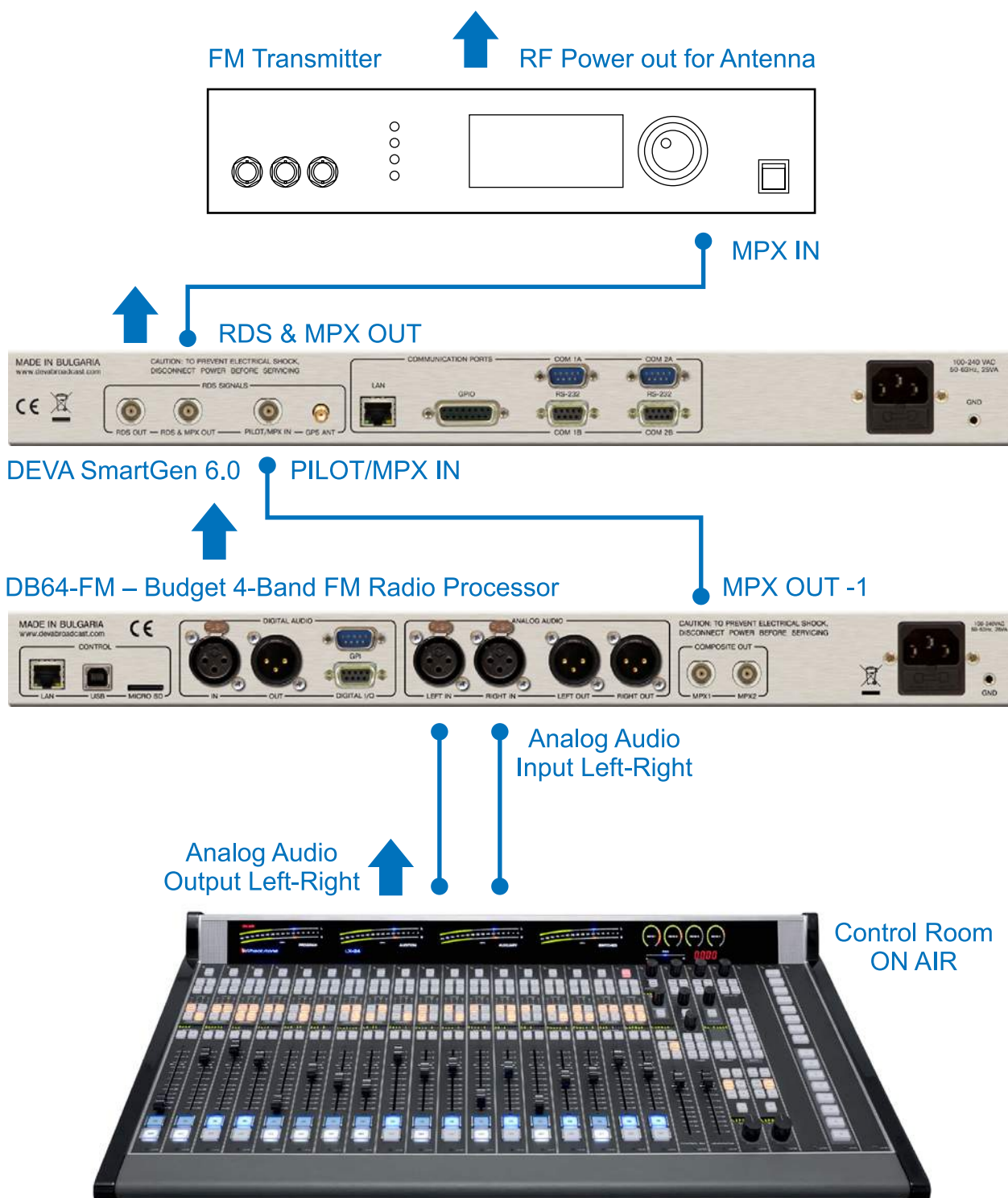


BROADCAST CONSOLE

IMPORTANT RECOMMENDATION: It is mandatory that the cable used for connection between DB64-FM’s MPX output, and the MPX input of the transmitter be as short as possible. This will prevent any face distortion.

Loop through

The output of the DB64-FM is wired directly to the PILOT/MPX IN of the SmartGen 6.0. The output of the RDS encoder will be connected to the composite/MPX input of the FM transmitter. This connection is not recommended, because the composite signal/MPX passes through the RDS encoder, and the transmission of the program will be interrupted in case of failure of the RDS encoder. If you are using SmartGen 6.0, such failure will be prevented, as the DEVA technology includes a Hardware Bypass between RDS & MPX OUT and MPX Input of the FM Transmitter. The RDS Subcarrier phase will be locked to the MPX stereo FM Signal on the outside.



BROADCAST CONSOLE

OLED Display, Navigational & Soft Buttons

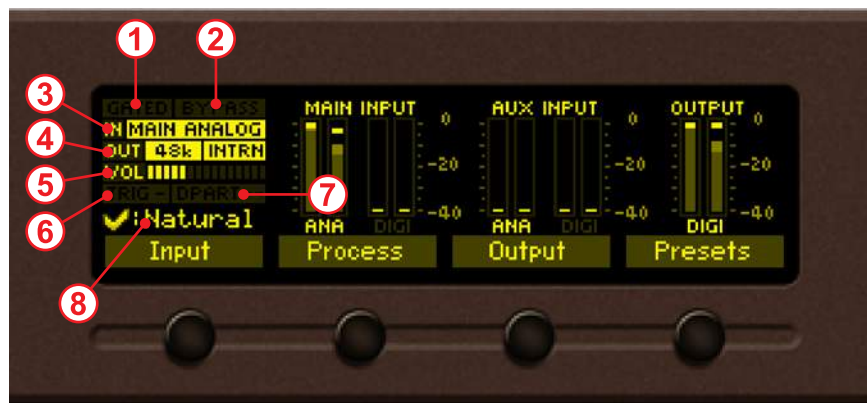
OLED DISPLAY

DB64-FM has an easy to read, high-resolution OLED graphical display that visualizes all measurements of the received signal and settings. Upon switching it on, the Company Logo and model of the device will be displayed. After a few seconds the Start-up screen will disappear, replaced by the Main Screen. This is the starting point of the navigation process.

DB64-FM's OLED display has three function areas: Header, Soft Buttons and Main Screen Working area.

Header area

The Header is located on the left part of the screen. The header content is determined according to the work area context and may include the following functions:



- GATED FLAG (1) – Will appear if the signal at the input is below the specified in **Process> Input Threshold level**.
- BYPASS FLAG (2) – Will appear if the entire processing is bypassed.
- IN (3) – Represents the currently selected active Input. If due to some reason the backup is activated the input information will start blinking, thus indicating that there is a problem with the main source.
- OUT (4) – Represents the currently selected active Output and its value. There are two types of digital output synchronization – internal and external. When the synchronization is internal the values will appear as depicted. If the output is set to external synchronization, this will be indicated with the following text - SYNC LOCK. If and due to some reason the external sync source has been loss, the indication will change to SYNC UNLOCK and start blinking. Then, the DB64-FM will switch to the internal sync source. For further information, please refer to [“Output” on page 65](#).
- VOL (5) – Indicator showing the phones audio volume;
- TRIG FLAG (6) – Will appear if a preset has been triggered electrically via outside equipment. The number of the GPI will also be displayed and below will be the currently used user preset.
- DAYPART FLAG (7) – Will appear when the option is in use.
- Currently selected preset (8)

Main Screen working area

The Main part of the OLED Screen is where the data changes dynamically, depending on the selected operating mode. The Menu Screen (shown below) appears upon pressing of the [OK] Navigational Button. DB64-FM's *Menu Page* contains selectable icons and soft buttons for selecting modes and functions. Pressing [LEFT] and [RIGHT] arrow buttons will change the icon selection on the Menu Page. The current selection is shown as a rectangle focus frame around the icon. Pressing [OK] button will navigate to the corresponding page.



Soft Buttons

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

The purpose of all Soft Button corresponds to the selected menu page. Most pages have the same or similar functional areas. The corresponding functions as Function, Menu Page, Parameter to be changed, etc., linked with the Soft buttons will appear as labels above them.

For example:

[SB1] – *Input*

[SB2] – *Process*

[SB3] – *Output*

[SB4] – *Presets*

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

Navigation Buttons

[UP], [DOWN], [LEFT], [RIGHT] and [OK] buttons are used to navigate through the menus, for selecting various functions and parameters of DB64-FM. The Main Menu structure has an up-and-down basis, expanded with left-to-right branches.

Menu Pages

The front panel menu is divided into several subsections, each of them containing parameters important for the processing and monitoring purposes. The most important settings are assigned to the soft buttons and automatically displayed on the OLED screen upon start-up of DB64-FM.



[Input]

All important settings to the analog inputs of DB64-FM, the Fallback sources etc., can be applied through this menu. In order for the proper work of DB64-FM to be guaranteed, the right reference levels of the digital and analog inputs should be set. For further information, please refer to [“Input” on page 56](#).

[Process]

All the audio processing path parameters that can be altered as per the user’s requirements are found here – **Name, Input, AGC/Stereo FX, Tone FX, Band, Final Limiter, MPX**.

[Output]

Just as the **Input** menu, all the needed settings to the output levels are applied through here, allowing quick and easy set-up.

[Presets]

The DB64-FM has an extensive set of factory presets and provision of 20 user ones. In order for a preset to be used, navigate to the desired preset and press the soft button labeled [Load], then [OK] and the preset will be loaded. For further information on the available presets and how to create a new one, please refer to [“Presets” on page 53](#).

Quick access to the most important status and audio parameters is also available via the [UP] and [DOWN] Arrows keys. Pressing the [UP] key will visualize the following screens:



Processing parameters, represented as bar graphs.



Left and Right Audio Input Levels (dBFS), represented as bar graphs.



Left Input level (dBFS), represented as graph.



Right Input level (dBFS), represented as graph.



AGC GR (dB), represented as graph.



Stereo Width(%), represented as graph.



Output Left level(dBFS), represented as graph.



Output Right level(dBFS), represented as graph.



MPX Deviation (%), represented as graph.



MPX Power (dBr), represented as graph.



HF Limiter GR (dB), represented as graph.



ST Limiter GR (%), represented as graph.



FM Limiter GR (dB), represented as graph.



RDS Screen

Settings

All the needed settings to the DB64-FM as regards the *Security*, *Dayparting*, *Communication*, *Trigger ports* and *Device* are applied through this menu.

From the same section the *username* and *password* for the WEB interface access can also be changed.

TRIGGER PORTS



If enabled the remote trigger port will allow you to select any of the first 8 user presets by pulling one of the 8 pins on the trigger port socket. If more than one pin is triggered at the same time, the pin with the lowest number will be with highest priority. For example, if all pins are pulled low, trigger 1 will be with highest priority.

Trigger port	User Preset Number
Trigger Input Pin 1	1
Trigger Input Pin 2	2
Trigger Input Pin 3	3
Trigger Input Pin 4	4
Trigger Input Pin 5	5
Trigger Input Pin 6	6
Trigger Input Pin 7	7
Trigger Input Pin 8	8

USEFUL TIP

In order for factory preset to be triggered, copy the settings of the desired preset in the user preset section.

KEYBOARD LOCK

To prevent unauthorized local access, the DB64-FM offers password protected keyboard locking. By default the keyboard is unprotected. To enable this function, using the front panel navigational menu, go to **Settings> Security> Front Panel**, then press [OK] and **Enable** the **Access Control** function. Set the preferred 5 digit password and **Access Timeout**.

Once the keyboard lock function is enabled, every attempt to use it will require a password: ENTER PASSWORD: 0****. Access will be denied upon false entry.



KEYBOARD UNLOCK

If the Keyboard unlock function has been activated by mistake, try to unlock it using the default password **01234**. In order to deactivate the code protection, once the front panel menu is unlocked follow the menu path **Settings> Security> Front Panel> Access Control** and then select **Disabled**.

If you do not manage to unlock the front panel with the default password, nevertheless whether it has been changed intentionally or not, DB64-FM should be returned to its factory defaults in order for the password security to be disabled.

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

RDS

This menu allows you to turn **On** or **Off** the **RDS Encoder** and set the **RDS Level**. Also, all basic elements of the RDS/RBDS are gathered in this menu – PI, PS, RT, TA/TP and etc. A list of alternative frequencies is also available. Each of the 25 AF (Alternative frequencies) are user defined and can be assigned via the front panel navigational menu.

Another great feature is that the **Radio Text** can be also edited via the front panel menu. In order for this to happen, once the relevant menu is selected, the [OK] button should be pressed so that the text could be edited. Use the [UP] and [DOWN] keys to navigate through the alphabet. Press [Insert] to save the new text.



DAYPARTING

Dayparting is the practice of dividing the day into several parts, during which a different type of audio preset to be used for the audio processing. This function will allow a processing pattern based on the radio's timetable to be made.

The menu path (using the front panel menu) is **Menu> Settings> Dayparts**. Then press [OK] to enter the menu. This subsection contains all the real time clock controls for switching presets.



Enable the **Dayparting** function in order to use it. There are nine positions at your disposal that can be set. Select one of them and press [OK] to enter the settings menu. Set the desired **Daypart Week Day**. For your convenience, the option **Every day** is also available through the same menu. Set the **Start Time** and **Daypart Duration**. Then, to finalize the set-up, select the preset that should be used during this time period. Repeat the same procedure for each of the positions that should be used.

Other sections

STEREO

All needed settings in order for your station to be broadcasted in stereo are applied through here, thus allowing more natural distribution of the sound.



STATUS

Information on the device's status, IP address, etc. can be found here.



Factory and User presets

FACTORY PRESETS

The DB64-FM has an extensive set of factory presets and provision of 20 user ones. In order for a preset to be selected/used, navigate to the desired preset and press the soft button labeled [Load], and then [OK].

How to create and save a User Preset or How to customize your sound

As the factory presets cannot always suit every format and market, each of them can be used as a basis for the creation of a new user-defined preset. Once you are satisfied with the result all the changes could be saved.

IT IS RECOMMENDED the user presets to be created prior to the installation of the DB64-FM in the broadcasting chain. Otherwise, any drastic changes of the audio quality and enhancements will be audible for the listeners.

The procedure is quite simple. Below you will find a step-by-step description of the process.

1. Start by choosing an empty preset, or a factory preset that you would like to use for a basis of the new one. The menu path is *Main screen> Presets* select preset and press the soft button labeled [Load], then [OK] to confirm the change;



2. Go back to the main menu and select the *Process* icon - modify the parameters that you think would improve the enhancement of your signal and will make your station's sound unique.



Specifying the new preset name is mandatory. If not, the DB64-FM will not assign a name and the newly created preset will be saved as U10 : DANCE (for example, if a factory preset is used as a basis) or U7 : -empty- (if user preset is used as a basis).



3. Once you have finished with the creation of your customized sound/preset, go back to the **Presets** page and find the modified preset. An **X** symbol indicating that some changes are being made will appear.



4. In order to save the changes, using the front panel keyboard, select one of the user presets then press the [Save] button. A window requiring verification will appear. Confirm the changes by pressing the [OK] button. The newly created preset will be automatically chosen as 'active preset'.



NOTE: Unless the new preset is created by a qualified/experienced broadcaster, it is recommended no general changes to the base preset to be applied, as this can lead to unwanted signal distortion.

WEB Interface

DB64-FM is also controlled through a built-in web server. A standard web browser can be used to monitor its status or to make some adjustments.

There are two options for access to the WEB Interface of DB64-FM:

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

MANUAL IP ADDRESS IDENTIFICATION

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

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

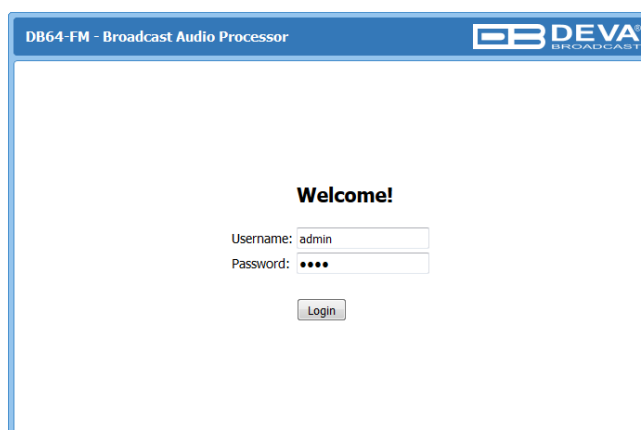
This operation will visualize the screen containing information about the IP Address of the device. Open a new WEB Browser and enter the device IP address in the address field then press [Enter].



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

A window that requires *username* and *password* will appear.

Default values being - *username*: **user** or **admin**, *password*: **pass**



NETWORK DISCOVERY

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

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

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

If you have already enabled this function on your computer DB64-FM will be automatically added to the Device list section. The device will be ready for usage and no additional adjustments will be required except user name and password.

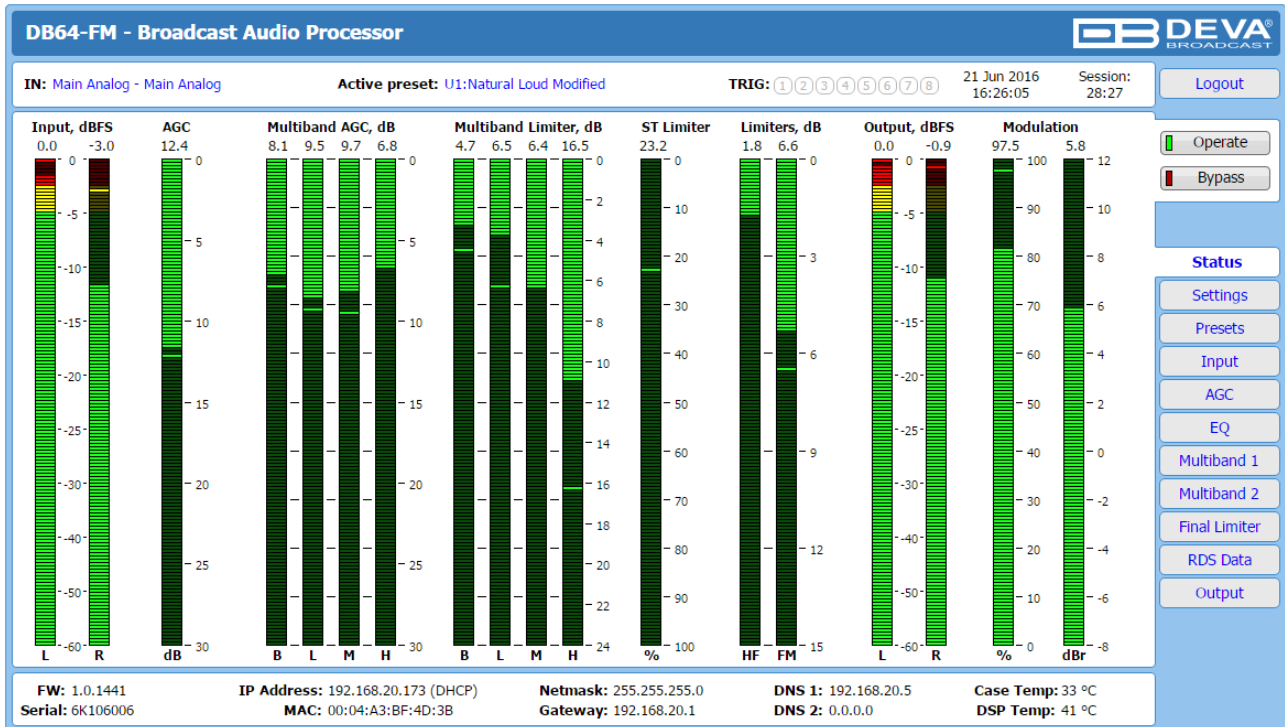
ACCESS

DB64-FM provides you with a protected access to the device settings. You can choose between two types of log in:

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

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

STATUS



The **Status Screen** shows all mandatory parameters represented as LED readings, just as the ones placed on the front panel of DB64-FM. The LEDs sequence is as per the processing path.

In order for DB64-FM.'s processing powers to be evaluated, and the difference between the processed and raw signal to be clearly heard, there is an incorporated [Bypass] option in the form of a button. When the [Bypass] option is enabled, the entire process will be stopped.

At the top of the control window is placed a constant section, containing information about the input in use, active preset, Trigger port status (if a factory preset is activated via the trigger port, the relevant number will be lit), Date/Time and Session Timeout.

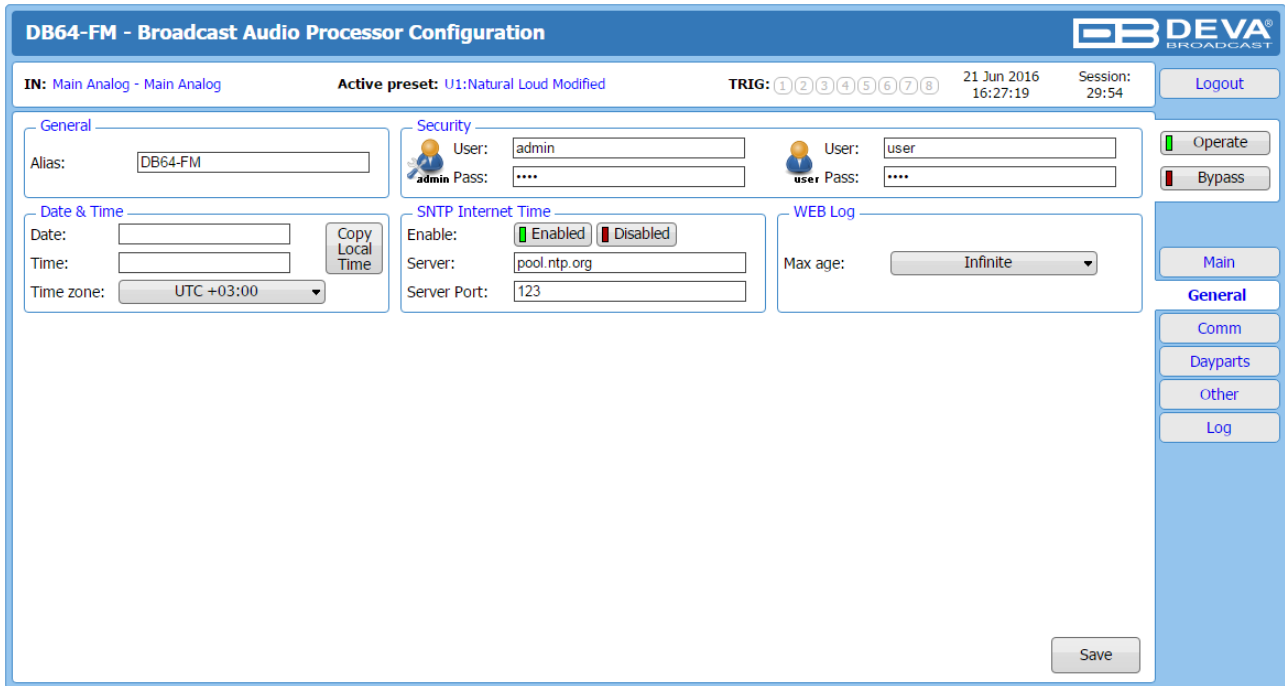
At the bottom of the control window is an information bar, gathering all the important connection parameters – Firmware Version in use, Serial Number, IP Address, and etc.

Upon change of the Web Interface screens, the main status window will resize automatically and become a constant part of each tab. Thus, allowing reading at a glance of all the mandatory parameters (**Settings** pages excluded).

SETTINGS

The *Settings* page is divided into several subsections. Each explained in details below.

General



DB64-FM 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 device's settings;
- As a **USER** – that will allow you to just monitor the device, while all the settings remain locked.

In order for the security of DB64-FM to be enhanced, 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 on all WEB pages. Customizing the name will make the device more recognizable.

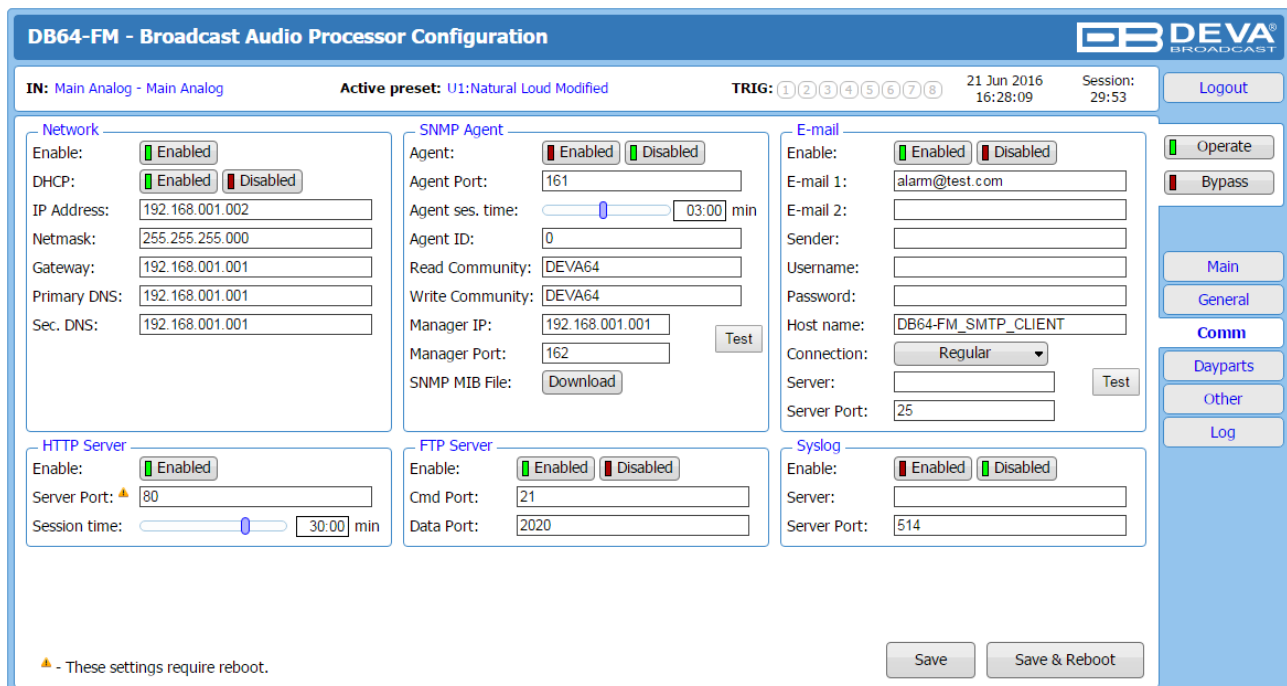
Date & Time – used for manually determining the current date and time. [Copy Local Time] button will set the *Date & Time* to correspond to that of your computer.

SNTP Internet Time – Synchronizes automatically DB64-FM's clock time 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).

WEB Log – the maximum storage time of the log files is chosen from here. Log files older than the specified will be permanently deleted.

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

Communication



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, DB64-FM will use Auto IP and will generate an **IP Address**.

SNMP Agent

Specify **Agent ID**, **Agent Port**, **Read/Write Communities**, **Manager IP**, **Manager Port** and **Session Timeout**.

Agent – enables/disables SNMP Agent.

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 DB64-FM 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

Enter the desired notification recipients in **E-mail 1** and/or **E-mail 2** fields. Fill in your e-mail account settings: **Sender**, **Username** and **Password**, **Server**, **SNMP port** and **Connection Type**.

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:

DB64-FM Test Message.

Please do not reply to this e-mail.

HTTP Server

Enable/Disable the *HTTP Server*. Specify the *Server Port* and *Session Timeout*.

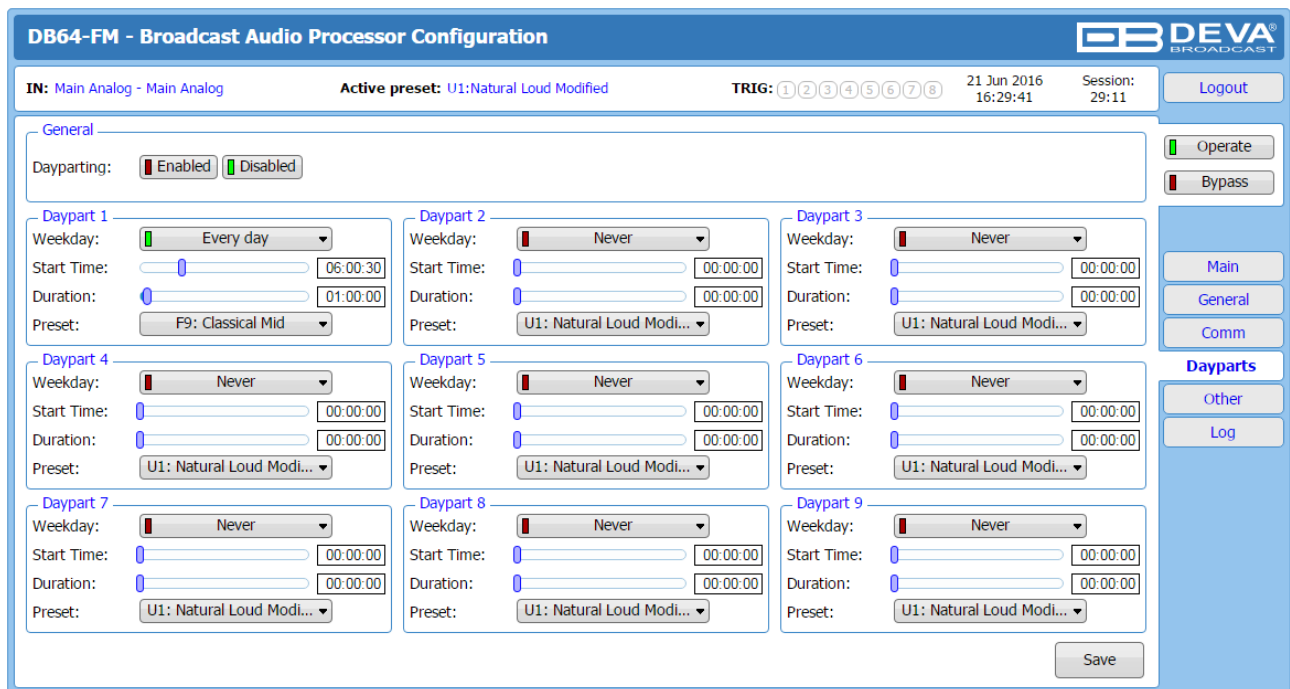
FTP Server

Enable/Disable the *FTP Server*. Specify the *Command* and *Data Ports* to be used.

Syslog

Enable or disable the *Syslog* feature. Specify *Server Address* and *Port* to be used.

Dayparts



The screenshot shows the 'DB64-FM - Broadcast Audio Processor Configuration' window. The 'General' tab is active, and the 'Dayparting' function is enabled. The interface displays nine daypart configuration slots (Daypart 1 to Daypart 9). Daypart 1 is configured with 'Every day' as the weekday, a start time of 06:00:30, a duration of 01:00:00, and the 'F9: Classical Mid' preset. All other dayparts (2-9) are set to 'Never' for the weekday, 00:00:00 for start time and duration, and 'U1: Natural Loud Modi...' for the preset. The interface includes a 'Save' button at the bottom right and a sidebar on the right with buttons for 'Operate', 'Bypass', 'Main', 'General', 'Comm', 'Dayparts', 'Other', and 'Log'.

Dayparting is the practice of dividing the day into several parts, during which a different type of audio preset to be used for the audio processing. This function will allow a processing pattern based on the radio's timetable to be made.

Generally enable the **Dayparts** function in order to use it. Please bear in mind that if the option is generally disabled the function will not be used, nevertheless the applied settings in sections **Daypart 1** to **Daypart 9**.

There are nine positions at your disposal that can be set. The settings to be applied for each of them are identical:

1. Set the desired **Weekday** from the drop-down menu. For your convenience, the option **Every day** is also available;
2. Set the **Start Time** and **Duration**;
3. To finalize the setup, select the preset that should be used during this time period.

Repeat the same procedure for each of the positions that should be used.

NOTE: It is recommended the unused dayparts to be set to **Never**. Also, please note that if the **Weekday** is set to **Never** the relative daypart will not be used.

Other

DB64-FM - Broadcast Audio Processor Configuration

IN: Main Analog - Main Analog Active preset: U1:Natural Loud Modified TRIG: ①②③④⑤⑥⑦⑧ 21 Jun 2016 16:30:23 Session: 29:58 Logout

Firmware Update
Firmware file: Choose File No file chosen Main: 1.0.1441 2016/06/16 Sub: 1.0.1441 2016/06/16 AUX: 1.0.1441 2016/06/16 Upload

Storage
Used Space: 128.00 KB Free Space: 7571.88 MB Format

System Log **Factory Defaults** **Reboot Device**

Clear Retain Presets & IP Retain IP Reboot

Operate Bypass

Main General Comm Dayparts **Other** Log

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.

Storage

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

System Log

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

Factory Defaults

[Retain Presets and IP] – all settings except for the Network settings (IP Address) and Presets will be deleted.


[Retain IP] – all settings except for the Network settings (IP address) will be deleted.

To restore DB64-FM to its Factory Defaults you should first select the desired option and then press the relevant button. 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 DB64-FM, 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.

Log

DB64-FM - Broadcast Audio Processor Configuration


IN: Main Analog - Main Analog **Active preset:** U1:Natural Loud Modified **TRIG:** 1 2 3 4 5 6 7 8 21 Jun 2016 16:31:04 Session: 29:17 [Logout](#)

2016-06-17 06:42:31	System	Storage init OK
2016-06-21 13:02:12	Control	Input Change, Main Analog, Main Recovered
2016-06-21 13:02:12	System	Device is running
2016-06-21 13:02:13	System	Storage init OK
2016-06-21 13:03:28	Control	WEB Login, 192.168.20.78, Admin
2016-06-21 13:03:51	System	Firmware 0.3.1439 2016/06/03 changed to 1.0.1441 2016/06/16
2016-06-21 13:03:59	Control	Input Change, Main Analog, Main Recovered
2016-06-21 13:03:59	System	Device is running
2016-06-21 13:04:00	System	Storage init OK
2016-06-21 13:04:13	Control	WEB Login, 192.168.20.78, Admin
2016-06-21 13:07:21	Control	WEB Logout, 192.168.20.78
2016-06-21 13:08:23	Control	WEB Login, 192.168.20.78, Admin
2016-06-21 13:11:37	Control	WEB Logout, 192.168.20.78
2016-06-21 13:12:02	Control	WEB Login, 192.168.20.135, Admin
2016-06-21 13:13:26	Control	Preset Change, F8:CHR 2, User selected
2016-06-21 13:13:37	Control	Preset Change, F3:All Programs, User selected
2016-06-21 13:13:44	Control	Preset Change, F6:All Programs Hot 2, User selected
2016-06-21 13:13:51	Control	Preset Change, F22:Top 40, User selected
2016-06-21 13:13:59	Control	Preset Change, F7:CHR 1, User selected
2016-06-21 13:14:07	Control	Preset Change, F16:Latino Punchy, User selected
2016-06-21 13:14:14	Control	Preset Change, F19:Natural Loud, User selected
2016-06-21 16:22:05	Control	Preset Change, U1:Natural Loud Modified, User selected
2016-06-21 16:22:16	Control	WEB Logout, 192.168.20.135
2016-06-21 16:22:40	Control	WEB Login, 192.168.20.35, Admin
2016-06-21 16:23:31	Control	WEB Logout, 192.168.20.35
2016-06-21 16:23:34	Control	WEB Login, 192.168.20.135, Admin
2016-06-21 16:24:32	Control	WEB Logout, 192.168.20.135
2016-06-21 16:24:32	Control	WEB Login, 192.168.20.35, Admin

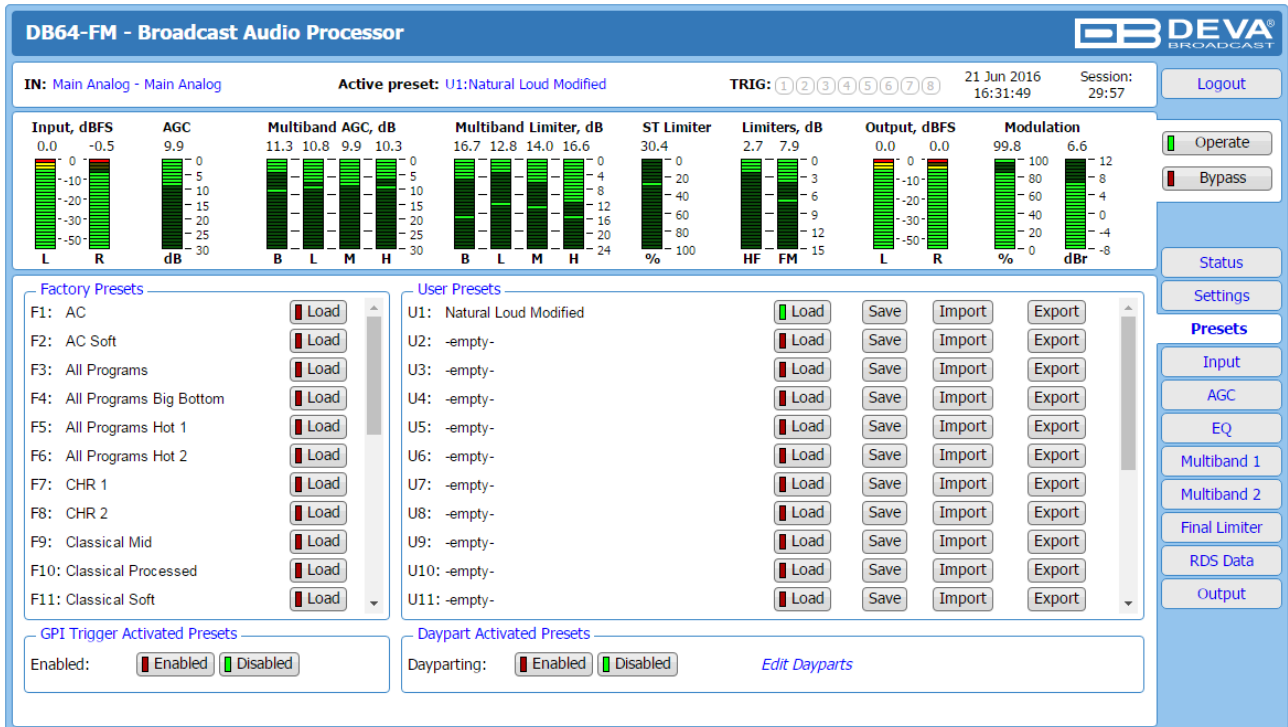
Operate

Bypass

[Main](#)
[General](#)
[Comm](#)
[Dayparts](#)
[Other](#)
[Log](#)

All device system events (front panel and WEB activity, presets change) are stored here.

PRESETS



The DB64-FM has an extensive set of factory presets and provision of several user ones. A preset contains all the audio processing path parameters that can be changed in the following tabs – **AGC**, **EQ**, **Enhancer**, **Multiband 1**, **Multiband 2**, and **Final Limiter**. In order for a preset to be selected/used, the [Load] button should be pressed (the active preset is illuminated in green).

Each of the factory presets can be used as a basis for creation of new user-defined preset. Once you are satisfied with the result all the changes could be saved.

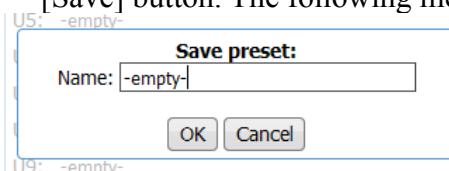
If the **Presets** are to be triggered via GPI, the option should be enabled via the relevant menu. The same is applicable for the **Dayparting**. Edit dayparts is a shortcut to [“Dayparts”](#) settings page.

How can a user preset be made?

IT IS RECOMMENDED the user presets to be created prior to the installation of the DB64-FM in the broadcasting chain. Otherwise, any drastic changed of the audio quality and enhancements will be audible for the listeners.

The procedure is quite simple. Below you will find a step-by-step description of the process:

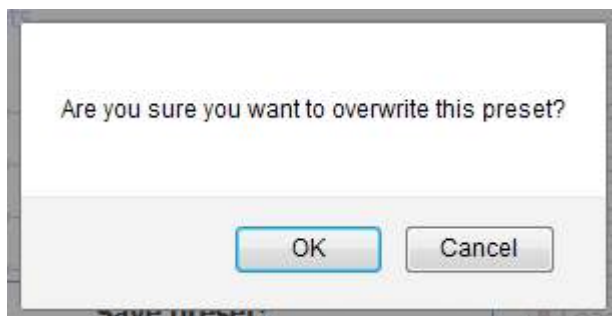
1. Choose an empty, or factory preset that you would like to use for a basis of the new one;
2. Modify the parameters that you think would improve the enhancement of your signal and will make your station's sound unique;
3. Once you are satisfied with the result, go back to the **Presets** page. You will notice that in front of the currently selected preset, a 'pen symbol' indicating that some changes are being made will appear. In order to save the changes select one of the user presets and press the [Save] button. The following message box will appear:



The screenshot shows a 'Save preset' dialog box. It has a text input field labeled 'Name:' with the value '-empty-'. Below the input field are two buttons: 'OK' and 'Cancel'.

Specify the preset name and press [OK].

4. A window requiring verification will appear. Confirm the changes by pressing the [OK] button;



5. The newly created preset will be automatically chosen as 'active preset'.

NOTE: Unless the new preset is created by a qualified/experienced broadcaster, it is recommended that no general changes to the base preset (if such is used) to be applied, as this can lead to unwanted signal distortion.

Preset Lock

As many of the stations prefer to use the services of qualified personnel when creating the perfect preset, the DB64-FM supports the function the newly created preset to be locked. The preset can be locked upon its export. The following options are available:

Key – the preset will be locked with a key known only by the creator. Thus, only users familiar with it would be able to import it into devices different than the one used for the purposes of creation;

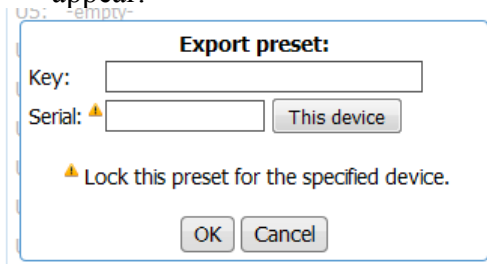
Serial – you can specify the serial number of the device on which the preset can be used. Only the unit with this serial number will be able to import this preset. If the preset should be used only by the current device, press [This device] button and the serial number will be automatically assigned.

Depending on your preferences, both, one or none of the above explained options can be used.

Presets Export

In order for a user preset to be exported the following procedure should be completed:

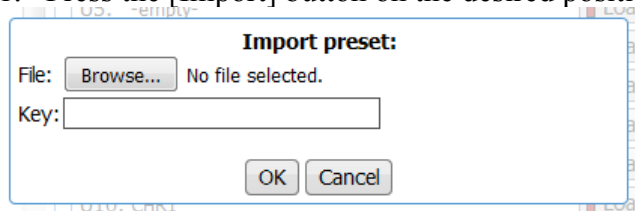
1. Select the preset to be exported via the [Export] button. The following message box will appear:



2. If the preset is to be lock – complete the needed information. If not, press the [OK] button to continue;
3. Confirm to save the file on your computer.

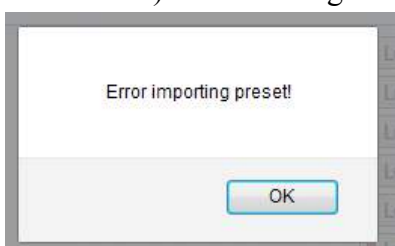
Presets Import

1. Press the [Import] button on the desired position. The following message box will appear:



2. Browse the file to be imported and specify **Key** if it has been locked. Then press [OK] to continue;
3. The newly uploaded preset will be automatically chosen as 'active preset'.

If the preset has been protected by password, or has been assigned to a specific device (via the **Serial** function) the following message will appear:

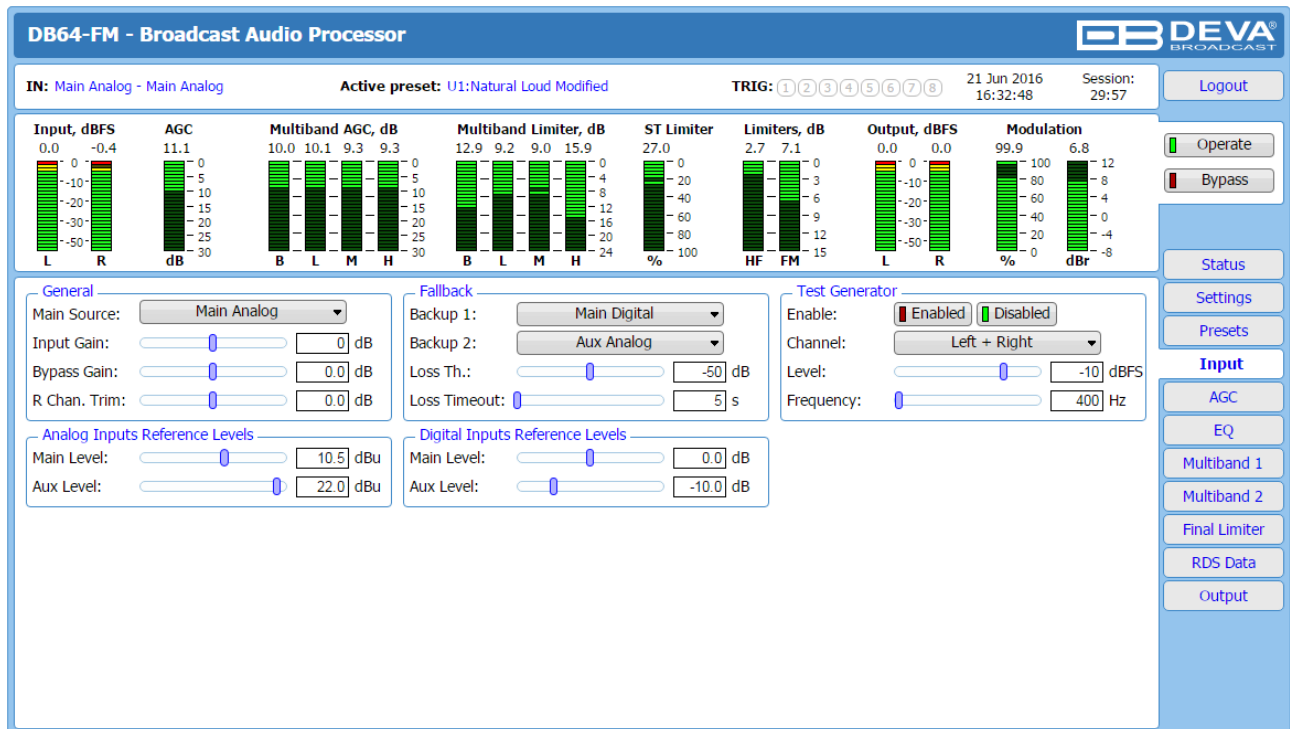


The same message will appear if the file is corrupted.

Presets Delete

The user presets can be changed or overwritten, but not deleted.

INPUT



General – Several types of Main Audio Sources could be set – **Main Analog**, **AUX Analog**, **Main Digital** and **AUX Digital**.

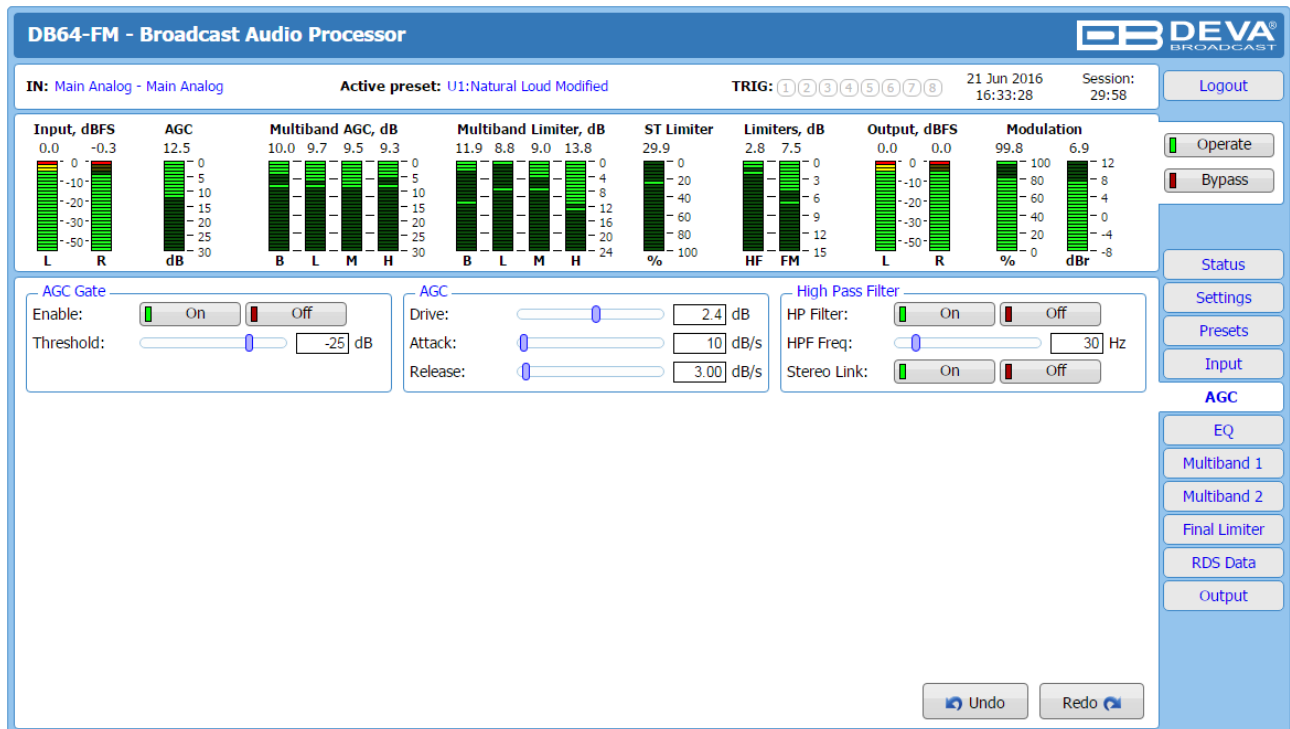
When setting the **Input Gain** level, have in mind that the applied settings have influence over the processed signal after the Input bargraph, thus meaning that the bargraph values will not change when altering the value of the Input gain.

Fallback – DB64-FM supports up to 3 fallback sources. In order for a source to be used a backup should be specified. The following options are available - **Main Analog**, **AUX Analog**, **Main Digital** and **AUX Digital**. The conditions when backup source has to be used should also be specified (**Loss Threshold** and **Loss Timeout**).

Test Generator – There are several modes of operation – **Left+Right**, **Left-Right**, **Left**, and **Right**. Set the **Level** and the **Frequency** of the signal at which the generator should process. The 'Test Generator' will generate a test signal with which the DB64-FM and the equipment connected to its outputs could be examined.

Analog/Digital Inputs Reference Levels – Set the peak levels of the analog/digital inputs. This corresponds to the absolute maximum level that the input could receive i.e. the user guarantees that the fed level will not exceed the one specified. The specified level in dBu corresponds to 0 dBFS.

AGC



The first processing stage is the AGC. It works across a large band of frequencies, and is intended to normalize the difference in the audio levels fed at DB64-FM's input. The AGC effectively reduces the volume if the signal is strong and raises it when it is weaker. Having the task is to even out the variances and to create a consistent performance, the AGC has influence over all the subsequent processes.

AGC Gate – if turned [On], in the event of audio drops below the user set limit (in dB), this threshold will pause the operation of the audio processor. Hence limiting the unwanted floor noise when the signal is too low.

AGC – this section allows you to set the *Drive*, *Attack* and *Release*. When setting these parameters, have in mind:

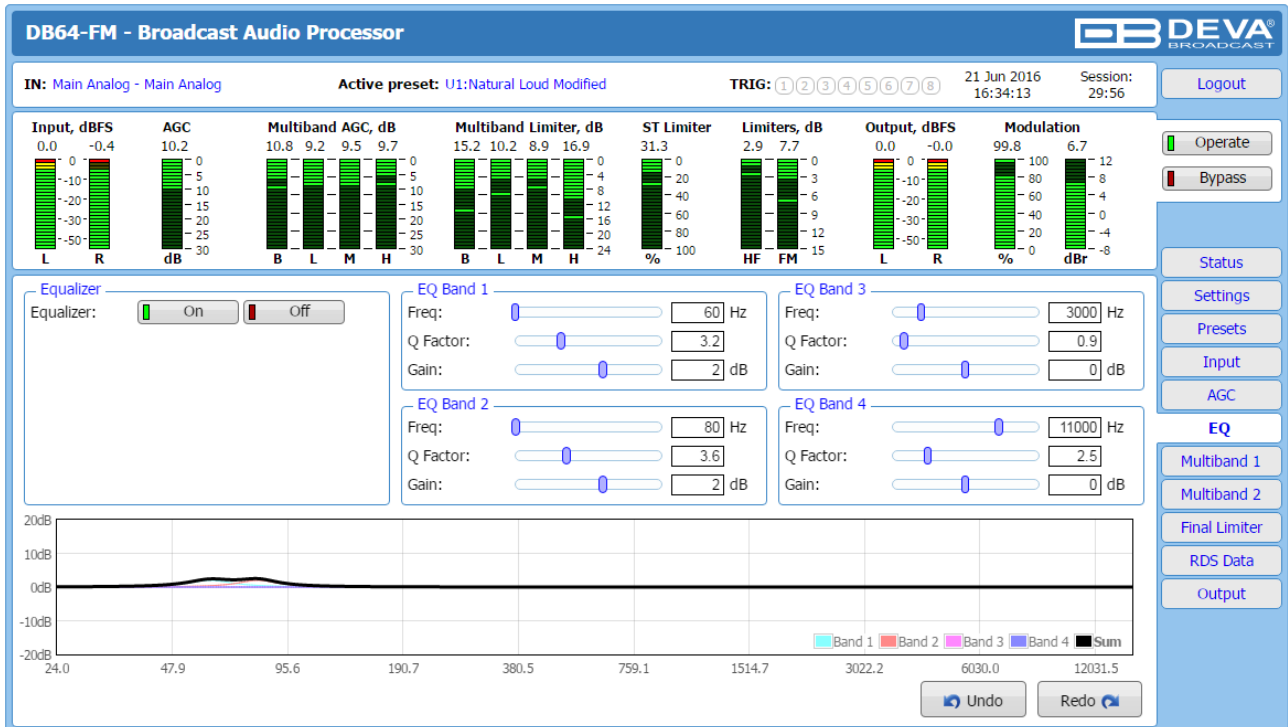
- **Drive (dB)** – depending on the value set, it will increase or decrease the gain at the AGC input. Increasing the drive will compensate for the very low levels, and vice-versa - the low drive will prevent the low level corrections at the input.

- **Attack** – set in dB per second, this value will define the AGC's speed of reaction to unexpected volume increase.

- **Release** – sets the AGC correction speed in dB per second. It is not mandatory high *Release* speed to be set, as the AGC is powerful enough tool. It is widely recommended the speed to be set to 1dB/s and 1.5dB/s for classical music, and to 2dB/s for all other commercial programs.

High Pass Filter – this sections allows you to turn [On] and [Off] the HP filter that passes signals with a frequency higher than the set **HPF Freq** (High Pass Filter Frequency), and attenuates signals with frequencies lower than the set **HPF Freq** (High Pass Filter Frequency). If the **Stereo Link** is turned [On], the audio processor will check for differences between levels of the left and right audio channel, and if need be, will restore the levels at the output. This feature is very useful for jazz and classical programs, as when applied to pop/rock programs it may lead to sound power loss.

EQUALIZER

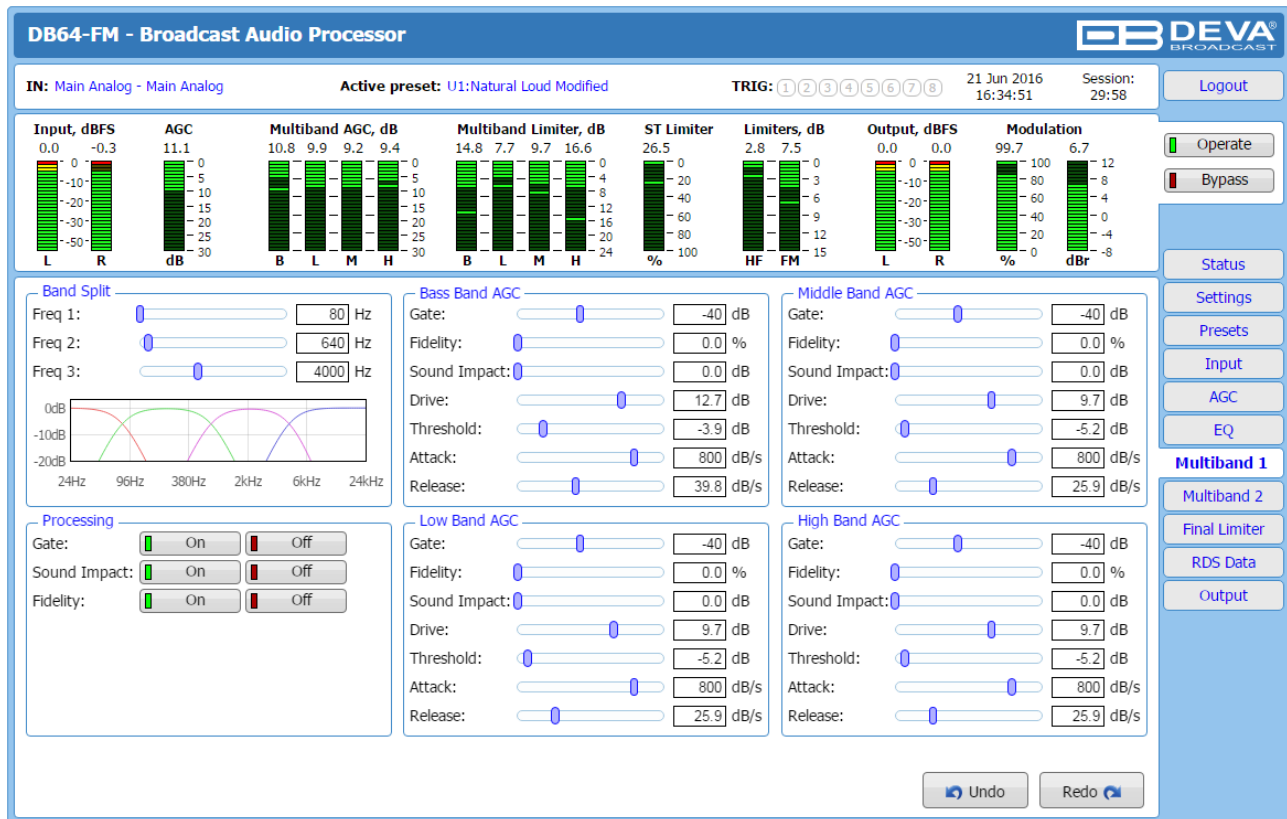


DB64-FM has four separate sections of ‘parametric’ equalization, which can be attributed to any combination of **Freq** (frequency), **Q Factor** (bandwidth) and **Gain** (amplitude). These may be assigned to any combination of low frequency EQ, mid-band EQ and top-end EQ chores. However, all four sections are identical and each of them may be programmed in frequency between **50 Hz** and **15 kHz**. Of course, there is an option the equalizer to be enabled or disabled.

Within each section of parametric equalization, the **Freq**, **Q Factor** and **Gain** are individually adjustable. The sliders of the **EQ Section** panel select the frequency range, and identical ranges are available in each equalizer section. As each EQ slider is moved, the resultant change in response, both in that EQ section and its overall contribution, is shown on the graph.

The graph placed on the bottom of the tab, displays the individual frequency response of each of the four equalizer bands and the summary frequency response of the entire EQ section, including pre-emphasis. Each band has a pre-defined color visible on the bottom right of the graph.

MULTIBAND 1 (MULTIBAND LIMITER)



Band Split is a great technique where audio signal can be separated into different frequency bands so that each band can be processed separately. Upon completion of the procedure, the respective bands can be combined together to form a more coherent and dynamic sound. Graphic visualization of the frequency bands is also available.

Processing – the multi band processing an unique algorithm that controls the gain in each band so as to assure sound stability. The sound color is controlled by the **Fidelity** parameter. It allows either a pure or a colorful sound texture to be obtained. The **Sound Impact** algorithm will keep the original authenticity of the sound attacks (peaks). The [On] and [Off] buttons in this section enable or disable generally the **Gate**, **Sound Impact** and **Fidelity** options for the bass, low, middle and high bands.

NOTE: The Multiband process is very powerful and can absorb the important sound variations. That is why is it not always necessary to use the AGC stage.

The Multiband limiters are used to restrain in limits each of the bands to prevent distortion in the processing control system. Each of the parameters can be changed as per the user's requirements. The settings to be applied are identical for some of the subsections and are described in details below.

Gate – When the audio drops below this user defined threshold limit, the DB64-FM will freeze operation band. When the signal is too low, this function will limit the floor noise.

Fidelity – This function controls the spectral balance between bands. For example:

- if the **Fidelity** = 0%, the bands will work independently and the sound will be more colorful;
- if the **Fidelity** = 100%, the bands will be linked to the spectral distribution at the input, and the sound will be purer.

Sound impact – As explained, this option keeps the original authenticity of the sound attacks (peaks). Pay attention when using the **Sound Impact** with value bigger than 6dB, as the average power of the sound will be significantly increased. In such cases, you may need to lower the band limiter or final limiter drive.

Drive – it is intended to create more or less gain at the input of the band. When setting the drive, note that:

- Increasing the drive will lead to reduction in the gain created by the band process. This will make up for the very low levels.
- A very low drive will prevent low level corrections'
- If you are not using the wide band AGC, we recommend the drive to the bands to be pushed, so that the reduction to be sufficient and correct low levels.

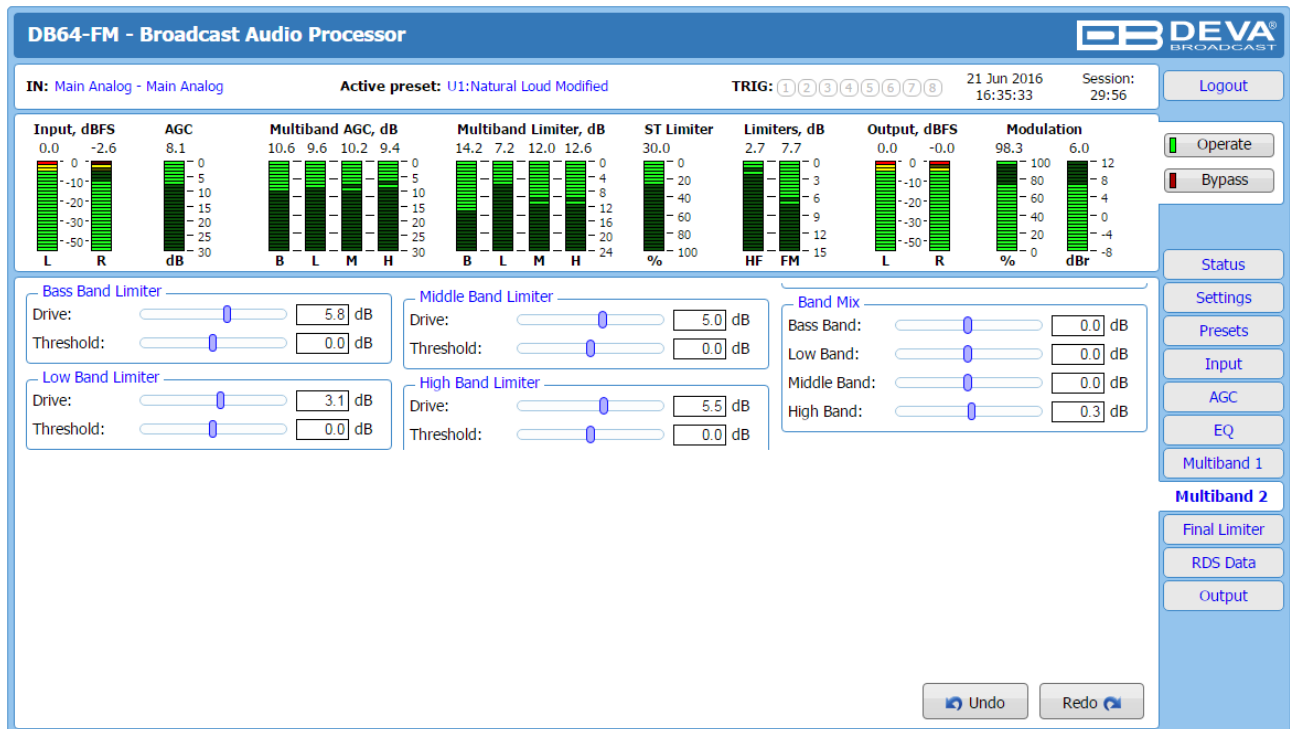
Threshold – sets working limits for each band. It can also move bands from the background to foreground and vice versa.

Attack – Adjust in dB per second to set the processors' reaction speed for each band. When setting the attack parameter bear in mind that:

- If lower value is set, the slower will the processor react.;
- If higher the value is set, the faster the processor react, thus controlling the rapid variations.

Release – is often associated with density. Indeed, the higher the release time is, the higher the spectrum density within the band will be. When setting this parameter, bear in mind that the Band processor is very powerful. Therefore, it is not necessary high release time to be set in order for high density levels to be obtained.

MULTIBAND 2 (MULTIBAND LIMITER)



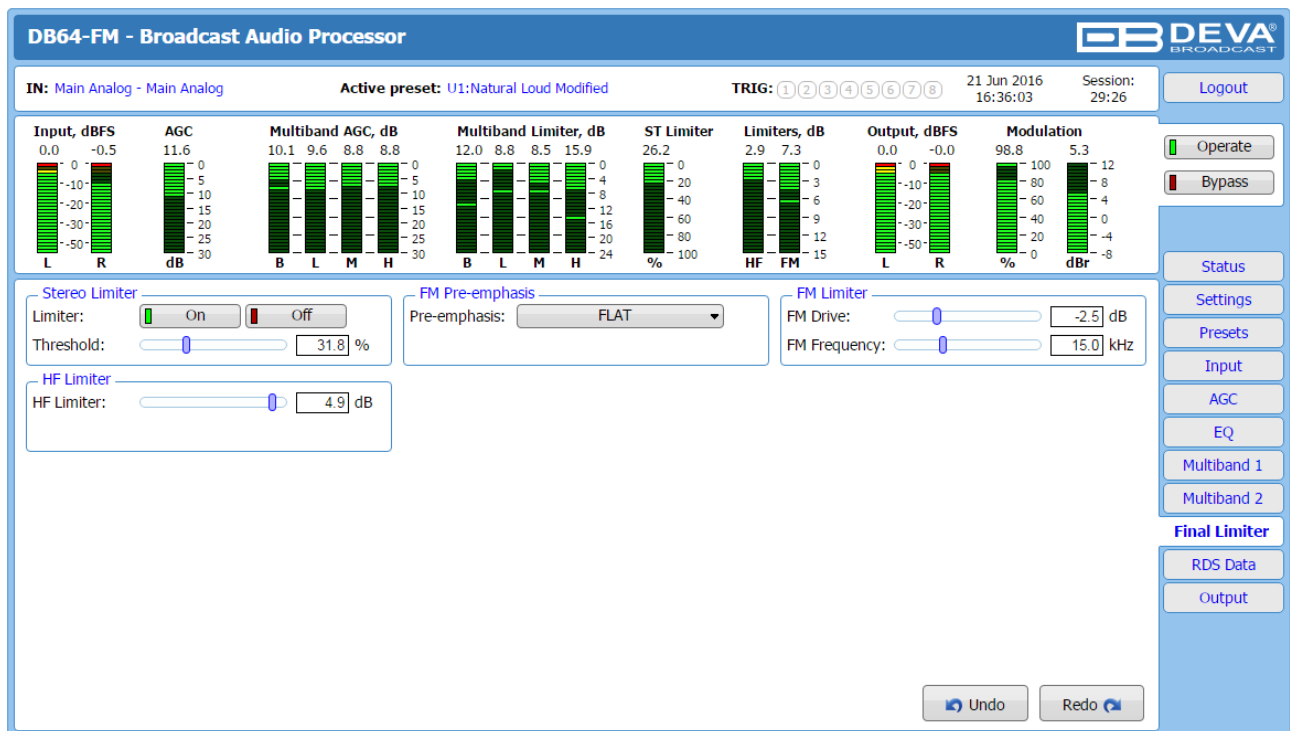
Multiband 2 (Multiband Limiter) is intended to prepare the processed audio for the final limiter. The applicable settings for each band have been simplified so as not to complicate the process with useless parameters. For each of the limiters you can set **Drive** and **Threshold**.

Drive – It is intended to create more or less gain at the band limiter input.

Threshold – sets the limit for each limiter band.

Band Mix – This section allows you to dose the output level for each band, hence, obtaining the best sound balance.

FINAL LIMITER



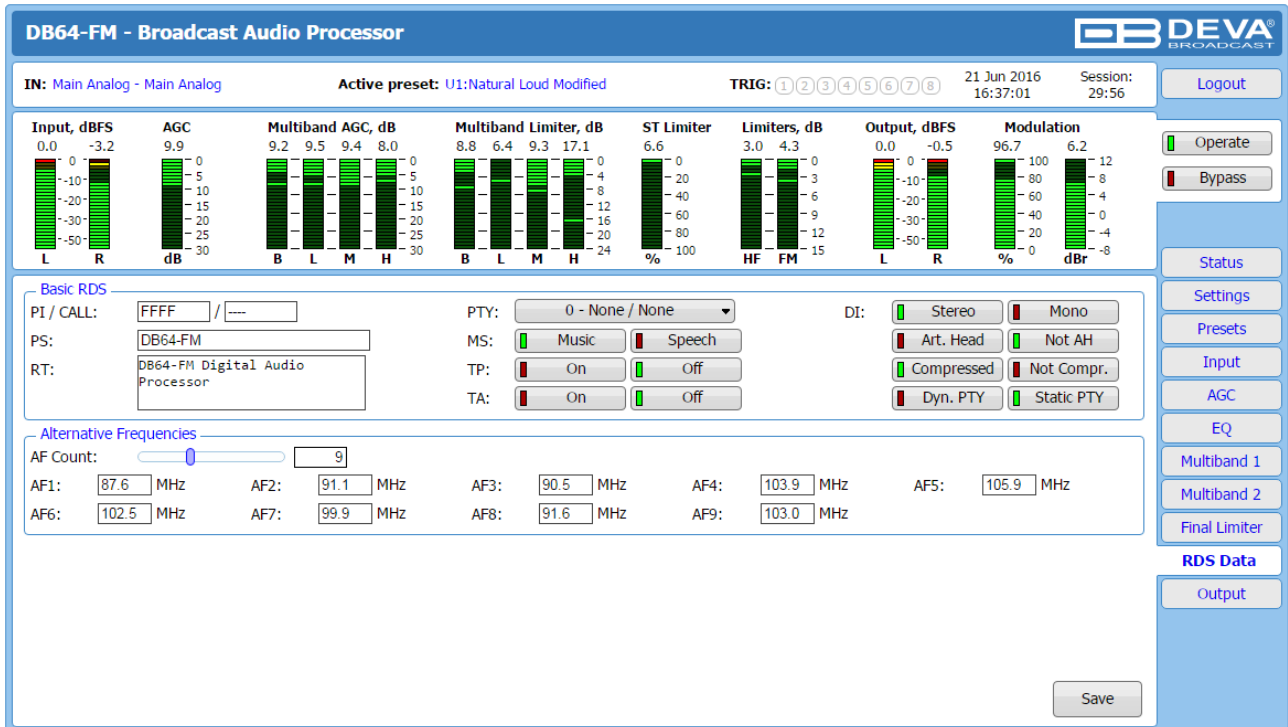
Stereo Limiter – set the stereo image reduction percentage required, compared with the maximum rate of 100%. If you are already using the *Stereo Enhancer*, we recommend you use a percentage value between 10 and 15%.

HF Limiter – set in dB the *HF limiter* is intended to increase or decrease the amount of high frequencies to be processed.

FM Limiter – the *FM Limiter* is intended for the FM applications. In its core, it is a very powerful clipper that controls the gain at the **FM limiter** input. Bear in mind that increasing the FM limiter drive may lead to significant sound distortion.

FM Pre-emphasis – set the preferred pre-emphasis type - **Flat**, **50μS** for Europe and **75μS** for USA. This setting is applicable for the FM output only

RDS DATA



All basic elements of the RDS/RBDS are displayed on the screen – **PI**, **PS**, **RT**, **TA/TP** and etc. The **Alternative frequencies** are also available, represented as a list. The number of the **AF** can be set via the **AF Count Slider**. Once the needed quantity of AFs is set, the frequencies for each of them should be specified.

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 DB64-FM. An in-depth discussion of the mathematical calculation is given in RDS/RBDS Standard.

To use the **PI** calculator for US 'K' and 'W' call signs, simply enter call letters into the CALL box. The hexadecimal code will automatically be calculated into PI box. If the hexadecimal code for a US station is known, you may enter it under PI, and then the call sign will be calculated automatically into **CALL** box.

When PI calculator fails to calculate PI or CALL the corresponding box will be filled with '----'.

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.

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.

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.

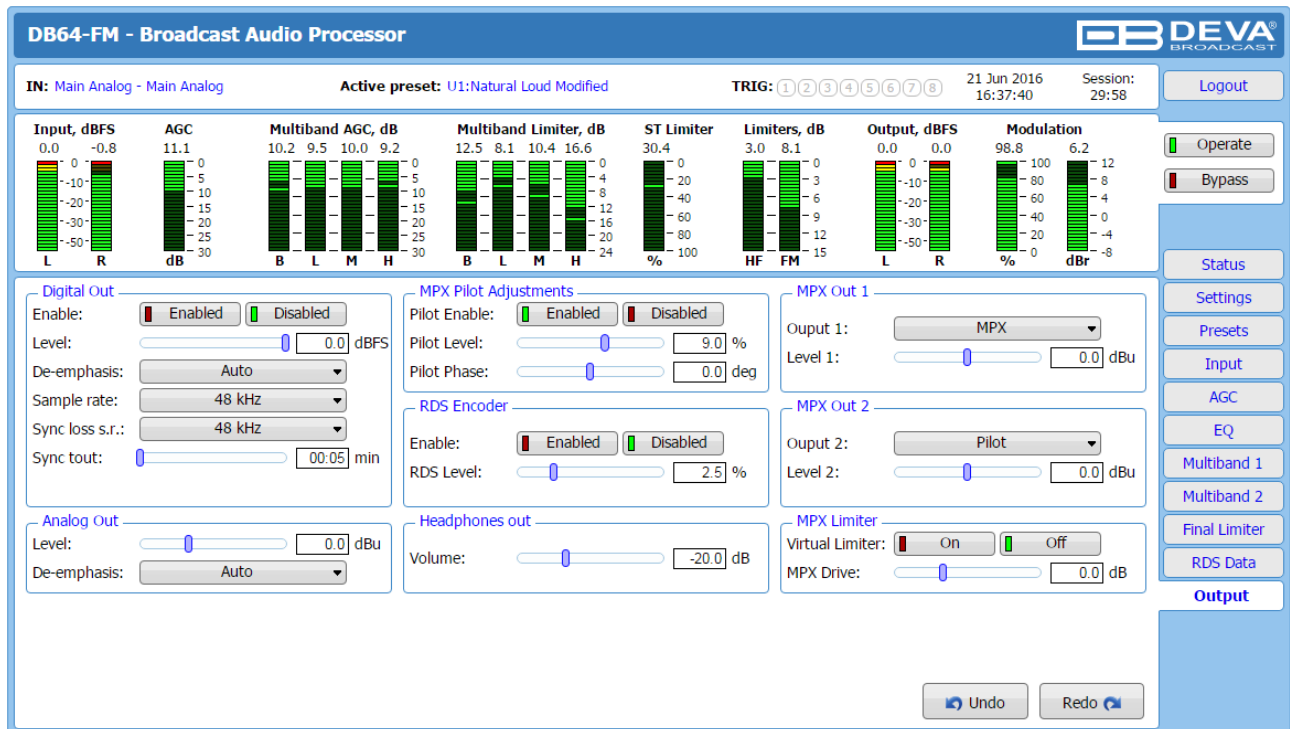
TP (Traffic Program Identification) – The TP flag identifies the station as one that routinely broadcasts traffic bulletins for motorists as part of its normal, everyday programming. When the TP flag is displayed on the receiver faceplate, the radio is searching for traffic announcements. The radio keeps 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.

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.

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.'

OUTPUT



All the needed settings to the outputs can be applied through here. Each of the available outputs is separated in different sections.

Digital Output / Analog and **Headphones Output** – is intended to control the peak output level of the digital and analog output. A De-emphasis option is provided on both the analogue and digital outputs. The following control options are available – **FLAT** (off), **50µs** (for Europe) and **75µs** (for USA).

The **Digital Output** should be internally or externally synchronized in order to be functioning correctly. This is specified by the Sample rate setting. If the synchronization should be made internally, a value from the standard range of **32 to 192 kHz** should be chosen. If the synchronization method is external, the relevant option should be selected from the drop-down menu. When External synchronization is chosen, **Sync loss s.r.** and **Sync tout** should be set in order for possible loss of the audio at the digital output to be prevented. If such is present, the DB64-FM will switch to internal synchronization (the value being specified in **Sync loss s.r.**) after the defined **Sync Timeout** expires.

MPX Out Level should match the one of the transmitter (or link device if one is used).

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 one-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 Authorization (RA) number issued by DEVA Broadcast Ltd. prior to its return. An RA 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.

APPENDIX A

RDS: EUROPE VS AMERICA

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

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

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

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

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

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

THE RDS SYSTEM

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

It is not within the scope of this Manual to cover the details of RDS subcarrier coding and modulation. For this, the reader is directed to the Specification appropriate to his location either the CENELEC EN50067 Specification for Europe or the United States NRSC Specification. Since the Manual will deal with specific implication of RDS implemented with the DB64-FM, it is assumed that the user is familiar with the RDS concept.

APPENDIX C.1

PTY Code Description Used in RBDS Mode – North America

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

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

APPENDIX C.2

PTY Code Description Used in RDS Mode – Europe, Asia

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