INSTALLATION AND OPERATION
INSTRUCTION MANUAL

MAXIMIZER

Digital MPX processor

DEVA®
BROADCAST

Contents

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Registration, Guarantee, Feedback

The equipment is warranted for a period of 2 years from the date of invoice (exworks).

The warranty does not cover faults provoked by carelessness, natural causes and parts subject to wear. In addition, the cost of labour and shipment is not covered. The warranty will be voided if the equipment is mishandled.

GUARANTEE

DEVA BROADCAST welcomes your comments on our products. Your suggestions may be extremely useful to develop new equipment and manuals and this will be of benefit to you too! Let us have your comments on our products and we will be pleased to read them.

Send your information by e-mail to the following address: info@devabroadcast.com, or send a letter to the DEVA BROADCAST SERVICE Department.

TECHNICAL SUPPORT

If you require technical support, contact DEVA BROADCAST SERVICE giving a clear and concise account of your specific problem. Quote the serial number of your equipment by referring to the DEVA BROADCAST nameplate attached to the equipment itself as this is the most important piece of information to be provided.

FACTORY SERVICE AND REPAIRS

If problems arise while the equipment is being installed, consult this manual and check that the installation is being carried out properly. If the problems still cannot be solved, call the DEVA BROADCAST SERVICE Department for further information. If the problem is a minor one we can a telephone call will probably suffice. If, on the other hand, the equipment is to be shipped to DEVA BROADCAST for service or repairs, the DEVA BROADCAST SERVICE Dept. will accept it only if the RMA return authorisation number has been provided. This number must be included in the shipping documents. We also recommend providing a detailed description of the fault which has occurred, the type of service needed and (if required) the name of the employee at the DEVA BROADCAST SERVICE Dept. you have spoken to. No repairs will be made if the cost of shipment is charged to DEVA BROADCAST. In this case, we will not accept the delivery.

SHIPPING INSTRUCTION

When shipping the equipment to DEVA BROADCAST, use the original package in order to be certain that it will be fully protected during handling. If you need the original package, call us for a new one. If you ship the equipment in a different packing container, take care to provide a double package by interposing padding material between the two containers in order to fully protect the equipment during shipment.

The package should be marked “FRAGILE” in red. Remember that the RMA number must be clearly visible on the package. If it is not, the equipment will not be accepted.

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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 it for condition.

• Avoid banging the equipment.

• The packing material (plastic bags, polystyrene, nails, etc.) must never be left within the reach of the 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 purpose 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 it from the 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.

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• Do not attempt to make repairs and/or adjustments when covers/guards or circuit boards are to be removed.

• Blown fuses inside the power supply indicate that there may be a fault in the power supply itself. The fuses must be replaced by qualified and authorised persons. It is advisable to call your nearest dealer.

• 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.

• The electrical wiring must be done in compliance with current electrical codes CEI 64-8 “Electrical specification for domestic buildings”.

• When installing, leave a clearance of at least 1 cm around the equipment to allow air to pass freely.

NOTE: *This piece of equipment has been manufactured to the highest standards of workmanship. It must be used properly and serviced as recommended to ensure long-term dependable operation.*

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1. Introduction

This manual is required for the correct use of your "MAXIMIZER", "MAXIMIZER" can be connected to any type of processor; the best performance being available from connection to the DEVA BROADCAST Stereo Encoder.

1.1. GENERAL DESCRIPTION

"MAXIMIZER" is an MPX processor which is able to effectively and precisely control the amplitude of the signal before it is fed to the transmitter.

The inclusion of a stereo enhancer (LUXOR) after the processor will justify the addition of this component in the transmission chain. The stereo enchancer should be inserted after the processor for maximum effect; this will, however, alter the stability of modulation defined by the processor. Another device is thus required to restrict this parameter between acceptable limits.

1.2. TOTAL CONTROL OF MODULATION

Whoever works with composite MPX signals will know only too well the sensitivity of the parameters involved; the many years of DEVA BROADCAST's experience has enabled us to effectively control amplitude (and therefore also modulation depth) without having any effect on the quality of the output signal.

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2. Installation procedure

2.1. THE BEST LOCATION

"MAXIMIZER" can work across a wide range of temperatures and thus its siting is not absolutely critical. "MAXIMIZER" has been designed to work from 0°C to 50°C in consideration of the fact that in most applications it will be inserted in an equipment rack together with other equipment. The ideal position for "MAXIMIZER" is in a 19" rack, with at least 1 rack unit of space above and below it. This will ensure that it can dissipate the heat it generates without creating local hot-spots. "MAXIMIZER" processes MPX signals and should therefore be mounted close to the stereo encoder using the shortest possible length of high quality cables. The output of "MAXIMIZER" will be connected directly to the transmitter (where there is only a single transmitter) or to an MPX distributor (where multiple transmitters have to be supplied). The output circuit of "MAXIMIZER" can feed cables of upto 10 metres in length without appreciable degradation of separation.

2.2. FIRST POWER-UP

Before switching on "MAXIMIZER", check that the line voltage corresponds to the indication on the rear of the power supply unit and that the supply to which "MAXIMIZER" is connected has a good earth.

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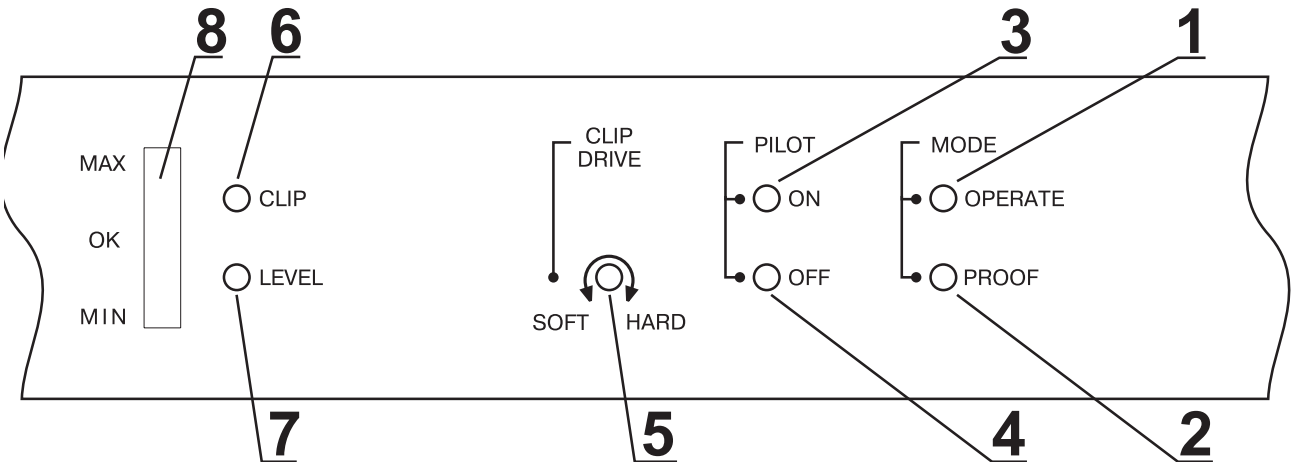
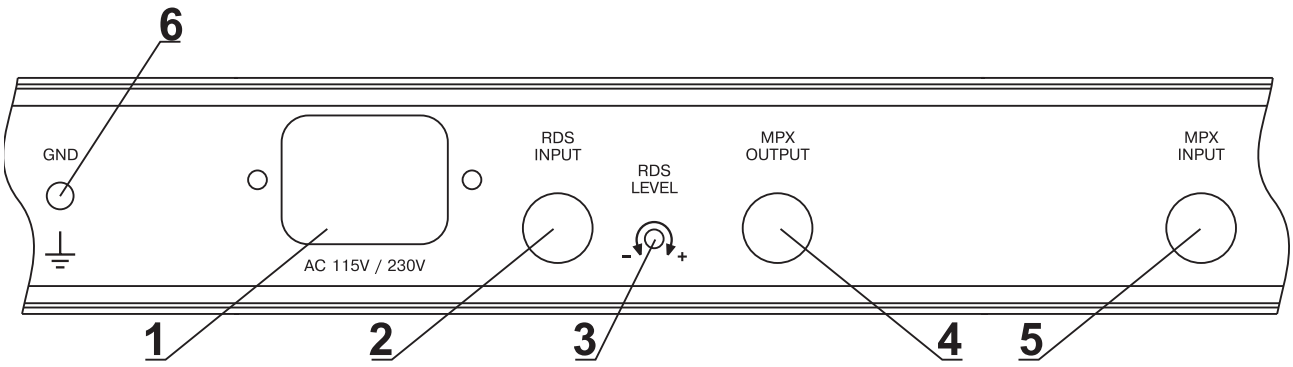
2.3. DESCRIPTION AND OPERATION OF CONTROLS

2.3.1. FRONT PANEL



1. OPERATE mode Led indicator
2. PROOF mode Led indicator
3. 19 KHz ON led indicating Pilot locked
4. PILOT OFF led indicating Pilot unlocked
5. Clipping threshold adjustment trimmer
6. Clipping led indicator
7. LEVEL trimmer for input level adjustment
8. Input signal level display

2.3.2. REAR PANEL



1. Line input connector MAIN
2. RDS IN input for RDS signal
3. RDS LEVEL trimmer for adjustment of RDS input signal level
4. COMPOSITE OUT composite signal output (MPX)
5. COMPOSITE IN composite signal input (MPX)
6. GND

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3. Getting Started

3.1. INPUT LEVEL ADJUSTMENT

3.1.1. TRIMMER LEVEL

The LEVEL control allows optimization of the input signal amplitude with respect to the internal reference level. The control can handle signals in the range of ±12 dB Whatever the position of the multiturn LEVEL trimmer, the input/output gain of the MPX signal will be unity (the transfer function will be unity). For correct adjustment please refer to the relevant chapter.

3.1.2. CALIBRATION OF CLIPPING THRESHOLD

This trimmer allows adjustment of the degree of clipping of the input signal. The trimmer is multiturn; anti-clockwise rotation (SOFT) will result in a small degree of control, clockwise rotation (HARD) gives a greater degree, "slugging" the modulation level. Activation of the control circuit is indicated by the red "2 dB" led.

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3.2. EXPLANATION AND ADJUSTMENT OF CONTROLS

3.2.1. OPERATE/PROOF

This control enables (OPERATE = green led on) or disables (PROOF = red led on) control of the MPX input signal. In PROOF mode, the signal passes through "MAXIMIZER" without any change. **Note** that, in the event of a power failure, a BYPASS relay connects input to output and allows the MPX signal to continue unaffected.

3.2.2. RDS ADJUST

This trimmer allows adjustment of the RDS signal amplitude. In the standard configuration (where splitting is not required) the RDS signal is inserted into the MPX signal after the stereo encoder; in this case, it is necessary to insert these two subcarriers after "MAXIMIZER" has performed its function and thus use the inputs available on the unit.

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3.3. SYSTEM CALIBRATION

3.3.1. CODER - “MAXIMIZER” - RDS - TRANSMITTER

The following calibration procedure is very simple and, at the same time guarantees stability of modulation: Inject a 400 Hz tone into the coder input in order to get an MPX signal output of 0 dBm (pilot signal -20 dBm). Apply the MPX signal to the “MAXIMIZER” MPX input. Connect the MPX OUT signal of the “MAXIMIZER” to the transmitter. Calibrate the transmitter input level for a deviation of 75 KHz. Remove the sample signal from the coder input. Reconnect the music signal to your Stereo Encoder and “MAXIMIZER””s intervention will be immediately evident, guaranteeing stability of modulation within the limits set during the calibration phase.

It now remains to select the type of processor intervention required: SOFT or HARD This parameter must be selected according to the musical effect required.

Coders RDS and SCA must be connect to the specific “MAXIMIZER” input because if they are insert in the MPX signal during the processing MPX could be degrade.

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4. Troubleshooting

4.1. PROBLEMS, POSSIBLE CAUSES AND SOLUTIONS

4.1.1. LOW INPUT LEVEL

- Check the stereo encoder's output level connected to "MAXIMIZER". Remember that "MAXIMIZER" has unity gain.

4.1.2. OUTPUT LEVEL HIGH OR DISTORTED

- Check the correct calibration of the system: Stereo coder, "Maximizer" and transmitter. For further information refer to the installation section.
- Check the output level of the stereo encoder connected to "MAXIMIZER". Remembering that "MAXIMIZER" has unity gain, check that the stereo encoder's output level is compatible with the transmitter's deviation adjustment.

4.1.3. AUDIO OUTPUT HAS HISS AND HUM

- Check that "MAXIMIZER" is connected to Earth.
- Check with a multimeter that Earth and Ground are separate.
- Check that cabling is correct.
- Check that the line supplies of the transmission system all originate from one point; never use distribution blocks for the serial distribution of the 220V line supply.
- Check if the noise disappears when "MAXIMIZER" is disconnected from the system; if so it implies that other equipment is not responsible for the malfunction.

4.1.4. TRANSMITTER OVERMODULATES

- Check that "MAXIMIZER" is switched on.
- Check that "MAXIMIZER" is in the OPERATE mode, indicated by the illuminated green led.
- Check that the MPX coder output level is not too high; if so, reduce the input sensitivity of the transmitter if it is not possible to adjust the coder.

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4.1.5. LACK OF STEREO SEPARATION

- Using a good quality FM receiver with a guaranteed minimum separation of -40 dB, put the system into calibration mode with the 400 Hz tone enabled.
- Disable one channel on the encoder.
- Adjust PILOT PHASE ADJUST on the CODER for maximum signal attenuation whilst listening to the disabled channel through headphones.
- Re-enable both coder channels once the procedure is complete.

4.1.6. STEREO SUBCARRIER MISSING FROM OUTPUT

- Check that the 19 KHz led indicator is ON.
- In the event that it is OFF, check that the pilot signal is being inserted by the coder.
- Check that the pilot frequency is 19,000 ±2 Hz.

4.1.7. NO RDS SIGNAL OUTPUT

- Check that the RDS level trimmer is not set too low or at minimum.
- Check that the RDS signal input to "MAXIMIZER" has a level of not less than -24 dBm.
- Check that the cable connecting the Coder's RDS output and the RDS input of "MAXIMIZER" is not short-circuit.

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4.2. POWER SUPPLY

4.2.1. "MAXIMIZER" DOES NOT SWITCH ON

- Check that the line supply cable is connected.
- Check the line supply plug.
- Check if "MAXIMIZER" works with another line supply cable.

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5. Technical Specification

COMPOSITE INPUT	
Impedance	10 KΩ unbalanced
Level	Adjustable ±12 dBm with multi-turn level control
Connector	BNC, floating over chassis
COMPOSITE OUTPUT	
Impedance	50 Ω unbalanced
Level	1:1
Connector	BNC, floating over chassis
RDS INPUT	
Level	Adjustable -24 ÷ 0 dBm with multi-turn level control
Impedance	10 KΩ
Connector	BNC, floating over chassis
OTHER FEATURES	
Max overshoots	Less than 0.5 dB with +6 dB over the normal input level
Frequency response clipper	20 Hz ÷ 100 KHz ± 0.3 dB
Signal to noise ratio	Greater than 80 dB Din audio
Stereo separation	Greater than 60 dB
Pilot Rejection	Greater than 60 dB
Attack time	5 Milliseconds
Release time	30 Milliseconds
Max cable length	10 mt. RG 58 A/U
GENERAL DATA	
Power requirement	AC 115V/230V, 60 Hz
Consumption	8 VA
Dimension	48.3 x 15.5 x 4.4 cm 1 rack unit
Weight	3.1 Kg. (6.8 Lbs)
Operating temperature	0 ÷ 50°C

ATTENTION: *All cables should not be more than 3 meters length.*