

# Digital Speaker Management System



**DSP-26**

Order No. 25.5780



## INSTRUCTION MANUAL

# Introduction

Congratulations on the purchase of your DSP-26. IMG Stage Line strives to be the best in high end digital audio processing. After you have become familiar with the processor, we encourage you to experiment and find the most effective and efficient way to run your system by utilizing the powerful processing of the DSP-26.

The DSP-26 is a powerful processor with two analog inputs, six outputs, ten PEQ bands per output and a frequency range up to 26kHz. The rugged analog input stage accepts input voltages of up to +22dBu thus matching any source on the market today, with an excellent dynamic range of 110dB. Using 64-bit digital processing and some of the best converters available on the market today, the DSP-26 offers sound quality which can compete with whatever your reference unit of choice is.

This User Manual describes how to operate the DSP-26's settings via the front panel controls. Alternatively, the DSP-26 can be configured completely via a remote connection to a PC or MAC. Please refer to the Software User Manual for details on the remote control application.

Controlled via the front panel or via the remote control application, the DSP settings and coefficients are calculated on-the-fly at the moment of changing the parameters. Frequencies can be set with 1Hz accuracy, delays with fifteen microseconds, accuracy, and gains with 0.01dB accuracy. When editing values via the front panel, some values are limited in granularity; e.g. gain is set via 0.25dB steps in this case.

## Features:

- 110dB dynamic range (inputs) / 114dB dynamic range (outputs)
- Electronically balanced inputs
- Matched-impedance outputs
- Frequency range 20Hz....26kHz
- ten parametric filters per output
- EQs can be set as Bell, High Shelf, Low Shelf, Notch, Allpass, Band Pass, High Pass, Low Pass
- 5ms delay per output
- Butterworth, Bessel, Linkwitz-Riley filters up to 24dB / oct.
- True RMS Compressor
- Zero Attack Peak Limiter
- Latency < 1ms
- Full configuration and real-time monitoring via PC or MAC (USB interface)
- Integrated 16-character LCD display
- 50 Presets
- 64 bits multi-mode digital processing

# Safety Instructions

**WARNING, FOR YOUR PROTECTION READ THE FOLLOWING:** The apparatus shall not be exposed to dripping or splashing liquid and no object filled with liquid, such as vases, shall be placed on the apparatus. CLEAN ONLY WITH A DRY CLOTH. DO NOT BLOCK ANY VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. DO NOT INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES, OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT. ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER. UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. Use only with the cart stand, tripod bracket, or table specified by the manufacture, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped. **POWER ON/OFF SWITCH:** If the equipment has a Power switch, the Power switch used in this piece of equipment DOES NOT break the connection from the mains. **MAINS DISCONNECT:** The plug shall remain readily operable. For rack mount or installation where plug is not accessible, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated into the electrical installation of the rack or building. **FOR PRODUCTS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE:** Replace fuse with same type and rating only. **MULTIPLE-INPUT VOLTAGE:** This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. Connect this equipment only to the power source indicated on the equipment rear panel. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel or equivalent. If connected to 240V supply, a suitable CSA/UL certified power cord shall be used for this supply. This equipment is intended for rack mount use only. **WARNING: THIS APPLIANCE SHALL BE CONNECTED TO A MAINS SOCKET OUTLET WITH A PROTECTIVE EARTHING CONNECTION.** The cores in the mains lead are colored in accordance with the following code: GREEN and YELLOW - Earth BLUE - Neutral BROWN. Live As colors of the cores in the mains lead of this appliance may not correspond with the colored markings identifying the terminals in your plug, proceed as follows: The core which is colored green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, or colored green, or green and yellow. The core which is colored blue must be connected to the terminal marked N or colored black. The core which is colored brown must be connected to the terminal marked L or colored red. This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the processor's chassis.

**WARNING:** If the ground is defeated, certain fault conditions in the processor or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

There are dangerous voltages present within the processor.

It is necessary for the user to refer to the instruction manual.

There are no user serviceable parts inside the processor.

Do not open the processor. Do not attempt to service the processor yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the processor wet. If liquid is spilled on the processor, shut it off immediately and take it to a dealer for service. Disconnect the processor during storms to prevent damage.

# 1. Overview of Connectors and Controls

In addition to the available features described in this manual, you also have the option of controlling the processor with a PC or MAC from a remote location via USB cable. Please refer to the Software Manual for details.

## 1.1. Front Panel



### 1.1.1. Input VU Meters

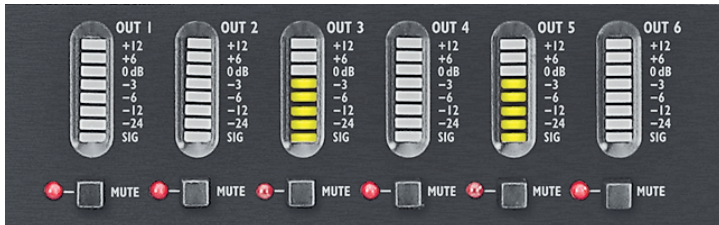
There are two independent input meters available. The LEDs indicate: Signal (-48dBu), -6dBu, Limit and Clip. The indication refers to the absolute input level, multiplied with the input gain. The Limit LED lights when any gain reduction is taking place in that channel. The CLIP LED lights when the input level reaches +22dBu.

### 1.1.2. Function Buttons

The function buttons allow direct access to all editing and navigating functions. See section three for a detailed description on the functions of each of these buttons.

### 1.1.3. Rotary Encoder

The rotary encoder is used to scroll through the menu items by pushing it, and to adjust values by rotating it. When values are changed, the DSP is updated in real-time.



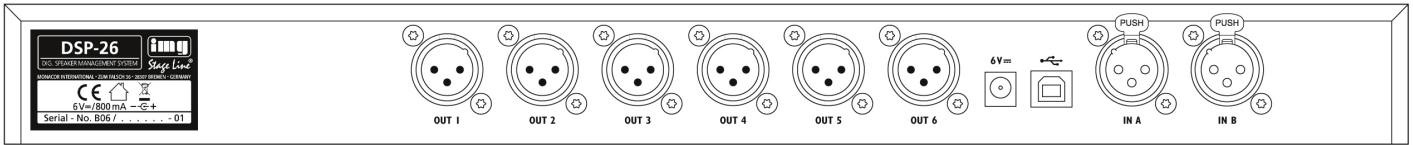
### 1.1.4. Output VU Meters

There are four independent output meters available. The LEDs indicate: Signal (-48dBu), -6dBu, Limit and Clip. The indication refers to the output level w.r.t. the threshold of the output peak limiter. The Limit LED lights when any gain reduction is taking place in that channel. The CLIP LED lights when more than 12dB of gain reduction is taking place.

### 1.1.5. Output Mute Buttons

The four output mute buttons are used for independently muting each output.

## 1.2.Rear Panel



### 1.2.1.Power Connector

The DSP-26 has an external power supply that will accept voltages ranging from 200V - 240V at frequencies from 50Hz-60Hz. An IEC cord is included.

### 1.2.2.USB Connector

The USB connector is used to connect the DSP-26 to a PC or MAC. It can then be configured and controlled in real time with the free PC and MAC configuration program. With this program you can also update your DSP to the latest firmware. Please check our website regularly for updates.

### 1.2.3.Analog inputs

The analog input section of the DSP-26 offers two electronically balanced XLR connectors. The input level is +22dBu max, electronically balanced.

### 1.2.4.Analog Outputs

The output section of the DSP-26 offers four electronically balanced XLR connectors. The output level is +9dBu max, impedance matched.

## 2. Getting Started

### 2.1. Quick Start

For those of you that wish to jump right in, the following information has been provided to act as a quick start guide for optimizing performance of your processor.

### 2.2. Connections

#### 2.2.1. Signal Connections

When setting up your processor, make connections as follows:

- Always make connections prior to applying power to the processor.
- Connect the output(s) from the sending device (mixer) to the Ch. 1 XLR input connector (mono) or both, Ch. 1 and Ch. 2 XLR input connectors (stereo).
- Make output connections from the output XLR connector(s) to the input connector(s) of the selected power amplifier(s).

Always make sure that your power amps are the last item turned on and the first turned off.

Once all of the connections have been made, and the processor is powered up, you can navigate through the entire signal path of your processor from the front panel. The display provides you with a clear and concise overview of each aspect of the signal path from the input (left side of display) to the output section (right side of display).

#### 2.2.2. Remote Monitoring and Control

For the quickest and easiest results we recommend to install and use the freely available PC or MAC configuration software. It provides a complete and comprehensive tool to make your loudspeaker configuration settings, and to manage your presets.

When connecting the unit via USB, make sure to connect it directly to your computer or to use a USB hub that supports USB 1.0. If you have problems with the USB connection, please refer to the Installation Guide for details on how to install the proper driver.

## 2.3. System Setup and Gain Structure

This product offers a wide range of tools for sound system design and setup. These tools can make your system more efficient and better sounding, but to get the best possible sound it is important to use these tools properly.

The following section explains how to maximize system gain and how to use the limiters to protect your amplifiers from clipping. In traditional system design, the output of your console would be routed to a system EQ, a compressor, and a crossover with output level control. From the crossover, there may be additional filters that are employed to improve the response of your speakers. There may also be limiters set up to keep your amplifiers from going into clipping and protect your speakers from the hazards of a clipped signal. Your amplifiers play a vital role in system setup, because they are last item in the chain before your speakers and offer the greatest amount of gain (that is their job after all). If your limiters and amplifiers are incorrectly setup you will not be using your system to its fullest potential and could be harming your speakers.

To ensure an optimal gain structure:

Play a signal at the nominal level from your mixing desk, and set the input gain of your processor to 0.

Set the crossovers that you want to use, while keeping the output gains also at 0.

With DISCONNECTED loudspeakers, turn up the volume of the power amplifiers entirely clockwise (full volume).

Now reduce the output gain and / or the output limiter setting to get the desired gain, so that the amplifier is just clipping and the built-in limiters of your processor are just limiting. If the amplifier does not have a built-in clip limiter, set your processor's limiter so that the amplifier does not clip.

Now turn down the volume of the power amplifiers, connect your speakers, and slowly increase the volume while checking the sound.

If all is well, there should be distortion-free sound, and the limiter LEDs are flashing or off, but not continuously on. If they are continuously on, reduce the output gain of your processor.

If you can not reach enough signal level, increase the processor's input gain or turn up the level from your mixing desk.

## 3.Setup And Operation

Before plugging the processor in, always make sure that the power supply matches the product specification voltage. Install this device on a flat, stable surface, not bend or curved. Do not supply power before all components of the system are set up and connected properly. Make sure to power-up your device before your power amplifiers are switched on in order to avoid transients, which could damage your speakers or annoy your audience.

### 3.1.System Check

After connecting all cables, you should mute all outputs first or turn the gain/level setting on your amplifiers to minimum. Activate the HF-outputs first. In case of wrong cabling, High Frequency (HF) audio signals will come out of bass-speakers that cannot be harmed this way. Vice versa, the Low Frequency (LF) audio signals would destroy your HF-speakers. It is advisable to install a large capacitor in series with HF drivers (47 - 100 uF). That way, drivers are somewhat protected against accidental instrumentation errors.

### 3.2.Input Setup

Press the Channel Up or Down button to select the input channel you wish to edit. Make the first settings with the output turned low or muted.

To toggle through the different items, press the Item Up or Item Down buttons.

#### 3.2.1.Gain

Adjust the gain by dialing the rotary encoder. The gain is adjusted in steps of 0.25dB. Smaller steps (0.01dB) can be set via the PC or MAC interface.

In AB Gain  
-2.25dB

#### 3.2.2.Input Selection

Select the source (Analog) by rotating the encoder.

In AB Input  
Analog

#### 3.2.3.Channel Link

By linking 2 channels, the settings are guaranteed to be identical for both channels, except for mixer and mute. Turn the encoder to set the Channel Link on or off.

In AB Link  
On

In A Link  
Off



### 3.3. Output Setup

Press the Channel Up or Down button to select the output channel you wish to edit. Make the first settings with the output turned low or muted.

To toggle through the different items, press the Item Up or Item Down buttons.

#### 3.3.1. Gain

Adjust the gain by dialing the rotary encoder. The gain is adjusted in steps of 0.25dB. Smaller steps (0.01dB) can be set via the PC or MAC interface.



#### 3.3.2. Mixer

Turn the rotary encoder to mix the signal from the selected input to the selected output. Push the rotary encoder to select the input. Attention: The mixer is only available while the outputs are not linked by Channel Link. If the channels are linked, the mixer will be skipped.



#### 3.3.3. Delay

Set the delay time by turning the encoder. Select the displayed unit (ms or s, mm or m, feet, inches, or mils) by pushing the encoder.



#### 3.3.4. Low Pass Filter

Adjust the Low Pass Filter frequency by turning the rotary encoder. You can switch the low pass filter off by turning the rotary encoder up (clockwise) until the frequency passes 20kHz.

Press the rotary encoder to change the filter type. Select the type by turning the rotary encoder. You can choose from: Butterworth 6dB, Bessel 6dB, Butterworth 12dB, Bessel 12dB, Linkwitz Riley12dB, Butterworth 18dB, Bessel 18dB, Butterworth 24dB and Bessel 24dB. Higher order filters may be set by adding filter sections in the PEQ blocks (see below).



#### 3.3.5. High Pass Filter

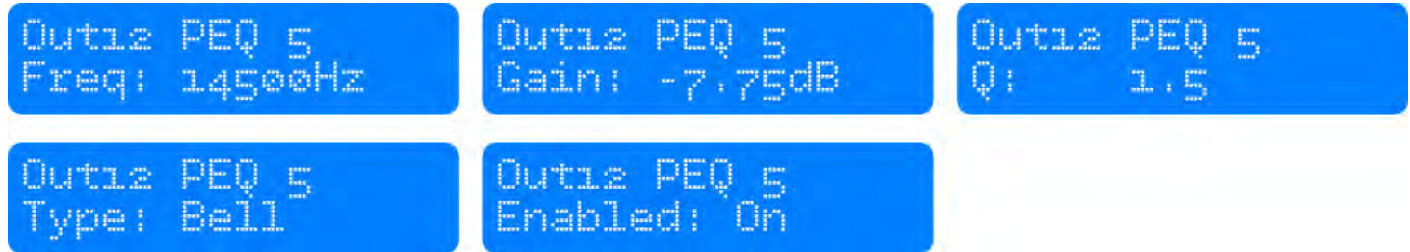
Adjust the high pass frequency by dialing the rotary encoder. You can switch the high pass filter off by dialing the rotary encoder down (counterclockwise) until the frequency passes 20Hz.

Press the rotary encoder to change the filter type. Select the type by turning the rotary encoder. You can choose from: Butterworth 6dB, Bessel 6dB, Butterworth 12dB, Bessel 12dB, Linkwitz Riley12dB, Butterworth 18dB, Bessel 18dB, Butterworth 24dB and Bessel 24dB. Higher order filters may be set by adding filter sections in the PEQ blocks (see below).



### 3.3.6. Parametric Equalizer (PEQ)

There are ten bands of parametric equalization. Each band can be adjusted freely over the complete frequency range of 20Hz to 20kHz. Adjust the frequency by dialing the rotary encoder. Press the rotary encoder to select the parameters. The available parameters are: Frequency (20Hz to 20kHz), Gain (-12dB to +12dB), Q (0.2 to 25), Enabled (On or Off), Type (Bell, High Shelf, Low Shelf, Notch, All Pass, Band Pass, High Pass, Low Pass). For the Shelving filters, the Q value sets the steepness of the filter in dB/Oct.



### 3.3.7. Limiter

The limiter is a zero-attack peak limiter. Only the threshold and release can be set. Press the rotary encoder to select the parameters. The release value is displayed in dB per second.



### 3.3.8. Phase Inversion

Turn the rotary encoder to switch phase inversion on or off.



### 3.3.9. Channel Link

By linking 2 channels, the settings are guaranteed to be identical for both channels, except for mixer and mute. Turn the encoder to set the Channel Link on or off.



## 3.4. System Menu

Push the Menu button to enter the system menu. Push the Menu button again to toggle through the menu items. The available menu items are:

### 3.4.1. Load Preset

Turn the rotary encoder to select the preset you wish to load. Push the rotary encoder to select it, then turn it again to select "YES" and confirm again by pushing the rotary encoder knob. The preset is loaded and all settings are applied immediately. All settings that were in the unit prior to loading the preset will be erased. This action can not be undone.

The presets contain all filter, dynamics, gain settings etc; in other words, everything that makes out a loudspeaker configuration. Presets do NOT contain the name of the unit, network configuration, automatic standby delay, user access rights and passwords.

### 3.4.2. Save Preset

Turn the rotary encoder to select the location of the preset. If that location is not empty, the preset in that location will be overwritten. This action can not be undone.

The system will ask you to give a name to the preset name. Select a character in the cursor position by turning the rotary encoder; pushing the rotary encoder confirms the character selected and moves the cursor to the next character to edit. Pushing the exit/ESC button erases the last confirmed character. Once the name is set up, push the menu button again. If you want to continue storing the preset, select Yes by turning the rotary encoder and confirm by pushing it. To cancel, push the exit button. Now your preset is saved in the selected location.

The presets contain all filter, dynamics, gain settings etc; in other words, everything that makes out a loudspeaker configuration. Presets do NOT contain the name of the unit, network configuration, automatic standby delay, user access rights and passwords.

### 3.4.3. Access Level

The DSP-26 has the option of locking away the front panel controls to avoid tampering of settings by unauthorized persons. To lock the unit, select "Locked" by turning the rotary encoder, and push it to confirm. The system will ask you to enter a password. Select a character in the cursor position by turning the rotary encoder; pushing the rotary encoder confirms the character selected and moves the cursor to the next character to edit. Pushing the exit/ESC button erases the last confirmed character. Once the password is set up, push the menu button again and the unit will be locked.

**ATTENTION:** Make sure to remember the password! When the unit is locked and you forgot the password, it is not possible to unlock it without contacting your local service representative.

To unlock the unit select "Unlocked" and enter the password. The password is automatically checked after each entered character, and the unit will exit the system menu when the password is confirmed.

The default password is "Password".

### 3.4.4. Version Information

By pushing the rotary encoder, the display toggles through some version information about the unit, as well as some parameters like IP address, MAC address etc.