

# ARK-70xx

Hardware Manual

v10.7.7



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## WELCOME

Just contact the new generation of digital processors **ARK**, designed and manufactured by VMB Española S.A

Before working with the processor we recommend that you read this manual, in its pages you will find instructions for use, programming examples and practical advice that will be of great help. Also consider reading the Software manual, available in separately and easily downloadable from the VMB web [www.vmb.es](http://www.vmb.es).

For the maximum optimization of any sound system a first class digital processor with different processing options is required. Thus **ARK** processors become a working tool of great value, providing the user with the best solutions in the market with the highest level of accuracy and a host of features for the professional.

We hope that as a user you will be completely satisfied. We are sure that the **ARK** processor will meet your expectations and make it easier for you to get the most out of your system.

## **IMPORTANT SAFETY INSTRUCTIONS-**



The **CE** mark of the **ARK** processor shows that it is verified and tested to accomplish the open Norms and International Norms about Electromagnetic Compatibility and Electrical Safety.

Radiated Emissions :	EN55013-1 (1996)
RF Immunity:	EN55103-2 (1996)
Electical Safety:	EN60065 (1993)
	IEC65 (1985) and emendation 1, 2 and 3

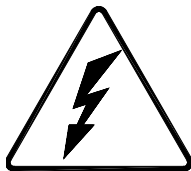
This product also meets the specifications of the following safety directives:

Low Voltage Directive 73/23/EEC

EMC Directive 89/336/EEC



Product Developed and Manufactured in the European Union.



**PRECAUCION  
RIESGO DE SHOCK ELECTRICO  
NO ABRIR**

**CAUTION  
RISK OF ELECTRIC SHOCK  
DO NOT OPEN**



The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that is necessary for the user to refer to the owner's manual.

Warning :

- Do not expose the processor to humidity and dust.**
- Do not take off the top cover.**
- Do not handle internal elements to avoid electrical shock.**
- Use only power cords in good condition.**

### ***Unpacking the ARK .-***

Before unpacking your new processor, verify that the box does not show any damage or deformation. If this happens, please claim the damage to your forwarder. Once unpacked and verified its correct operation, keep the original box in case you need to ship it back to your provider.

## 1.-INTRODUCTION

ARK-70 series offers the user a perfect tool for processing, with four processor models available with two or four inputs and eight outputs (analog or digital and Ethersound system optional).

ARK-70 series processors offer Double Dynamic, with a RMS compressor/limiter and PEAK limiter. RMS limiter is used to adjust the sound level of the transducer, keeping the original dynamics while respecting the original transition, getting a better acoustic result. Peak limiter controls the maximum movement of the speaker, and protecting against damage while reducing the distortion caused by an over-excursion. This Double Dynamics minimizes distortion levels and provides protection for all acoustic and electronic components of the system.

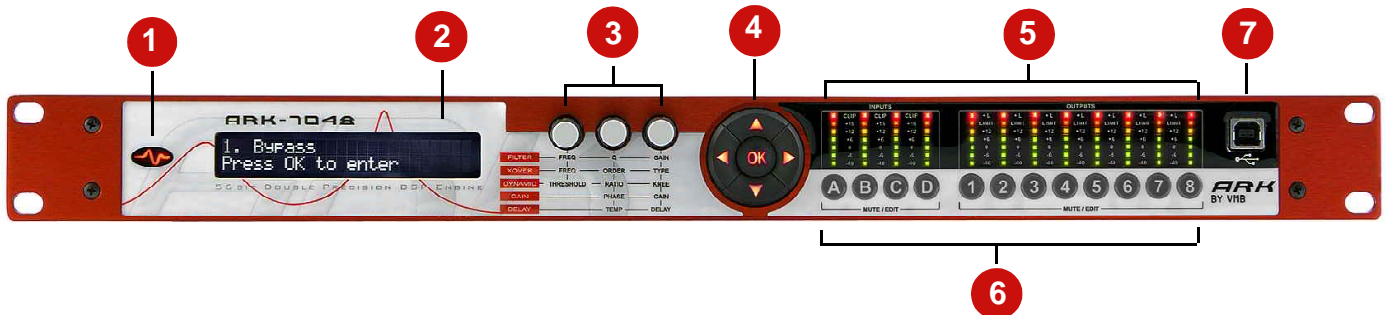
With fixed latency of 0.6 ms ARK processors offer one of the lower latencies on the market. All ARK models offer 120 dB dynamic range and AD-DA converter Cirrus Logic high-performance 24-bit and 96 KHz. The internal DSP processor works with double precision floating point, reaching a 56-bit internal resolution, one of the highest resolutions available today on the market. This allows the use of high-precision filters with very low distortion and providing a quality and unsurpassed sound clarity.

ARK-70 processors offer an atmospheric compensation function, essential when working outdoors, where temperature and humidity can vary considerably between day and night causing a major loss at high frequencies, especially over long distances. Each output can be configured separately depending on the throw required for each box.

In the security section, different levels of access restrictions are included. That can be managed by a global password and a preset password, with the choice to select which processing functions can be modified or not. The front panel can also be blocked, denying any access.

For the available ARK control software, we recommend reading the software manual. The control software for ARK processor is designed to provide the user with a fast and intuitive access to each process area, facilitating the programming of the processor from a computer. The software manual is a document available in the downloads section of the web site [www.vmb.es](http://www.vmb.es)

**ARK70's frontal panel description-**



**1.- POWER SUPPLY INDICATION.**

Indicates that the processor is switched on.

**2.- LCD DISPLAY.**

24 characters LCD Display. Shows the menus, function information, and various user editable parameters.

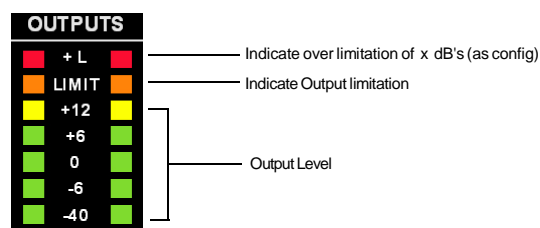
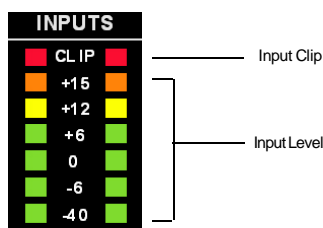
**3.- ENCODERS.**

3 encoders from which we can modify in real time the different parameters assigned to each

**4.- NAVIGATION BUTTONS.**

Five buttons to scroll through menus, confirmation or cancellation of the parameters

**5.- SIGNAL, LIMITATION AND CLIP LEDS.**



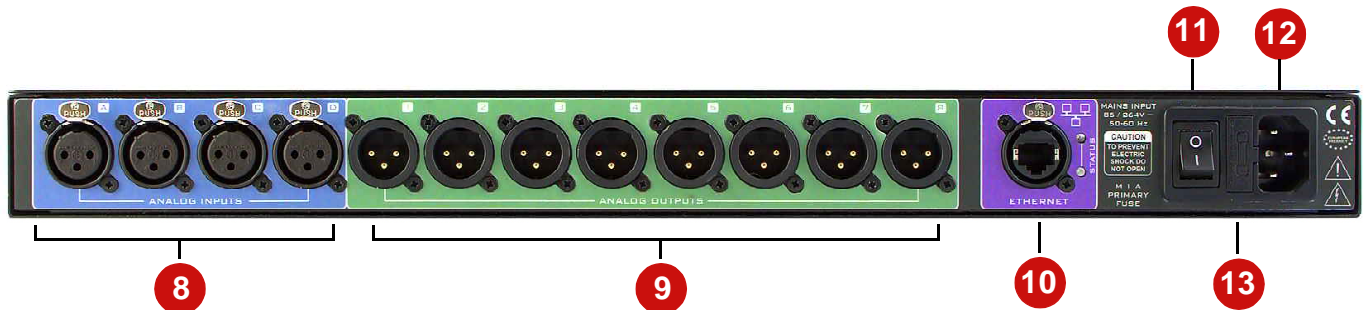
**6.- PUSH MUTE / EDIT**

Used to select the track you want to change if editing a preset or to silence directly.

**7.- USB.**

USB connection from the frontal to set parameters or update the firmware via ARK software.

## ARK Back panel description.-



### 8.- AUDIO INPUTS.

Depending on the option:

**Analog:** Balanced signal via female XLR connectors.

**Digital AES/EBU:** Female XLR connectors. Accept from 32kHz to 192kHz.

**Ethersound:** Inputs are taken from an Ethersound network via Ethercon RJ45 professional connector.

### 9.- AUDIO OUTPUTS.

Depending on the option:

**Analog:** Balanced signal via male XLR connectors.

**Digital AES/EBU:** Male XLR connectors.

**Ethersound:** Outputs are inserted into an Ethersound network via Ethercon RJ45 professional connector.

### 10.- ETHERNET CONNECTOR.

Ethercon RJ45 professional connector for a secure connection.

### 11.- POWER ON SWITCH.

### 12.- IEC MAIN POWER CONNECTOR .

The power cord is supplied together with the processor. The **ARK** includes a precise switching power supply. It withstands power supply from 85 to 264 volts and is continuously self-regulating providing a perfect functioning even with poorly regulated voltages.

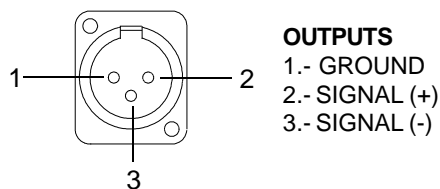
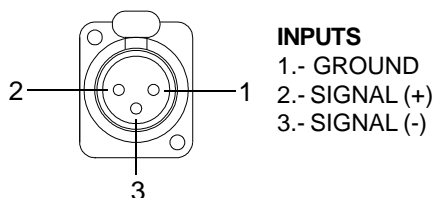
### 13.- FUSE HOLDER.

1A fuse. (Always replace with equivalent fuses)

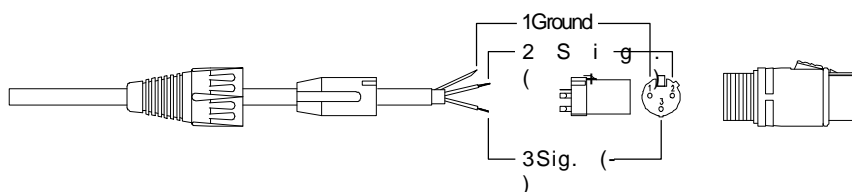
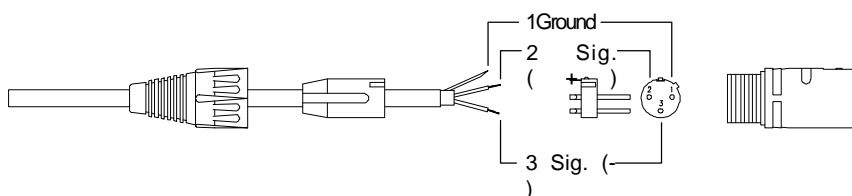
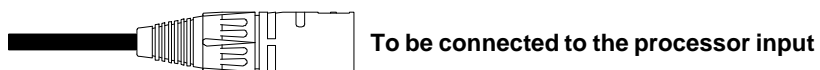
## 2.- SET UP AND CONNECTION

### Connectors and connections.

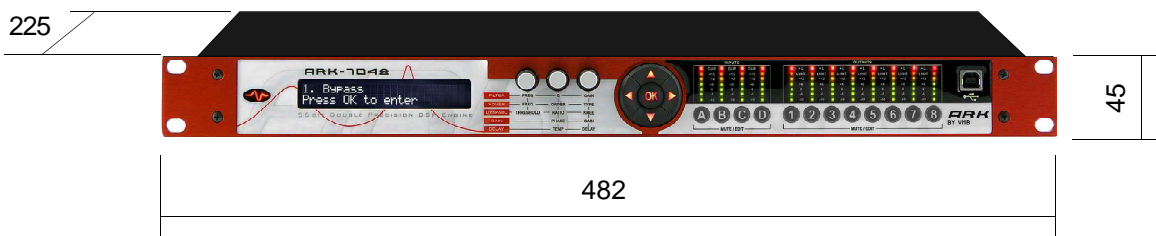
#### XLR SOCKET CONNECTORS



#### OVERHEAD XLR CONNECTORS



### ARK dimensions (in mm).

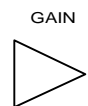
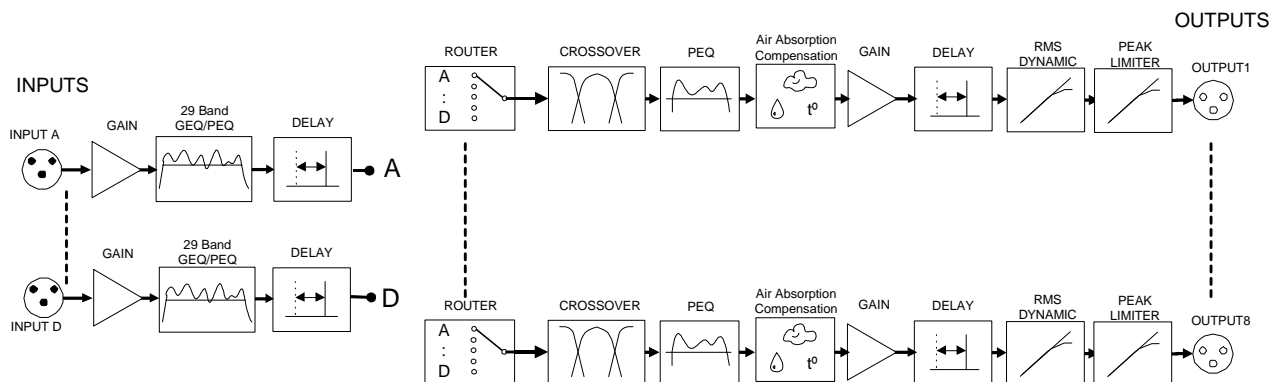


### 3.- FUNCTIONAL DESCRIPTION

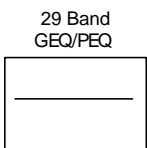
#### ARK-70 Process diagram.

Four floating point DSPs (Digital Signal Processors) with 56 bits of internal resolution are included in the **ARK** processor. All this calculating power is used in the signal processing algorithms which control all the process: input delays, global equalisation, crossover filters, individual equalisation for each way, output delays, protections and dynamic control and independent noise gate per output. All of these algorithms have been developed to provide the best precision and the lowest round-off noise in the calculations. This way, the best sound fidelity and transparency free of noise is achieved. The wide internal range (56 bit) allows the use of high-precision filters with very low distortion. Cirrus Logic converters 24-bit and 120 dB dynamic range assures a clean sound without distortion and background noise makes the ARK-70 one of the processors in the market with the best technical characteristics.

Once the analog input signal is converted into a digital one, the processing inside the **ARK** DSPs is as follows:

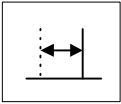


**GAIN:** Gain control. Gain adjusting in inputs to adapt/fit the signal level sent from the mixing console and in the outputs to adjust the level supplied to each amplifier and to equalize the sensitivity in each way.



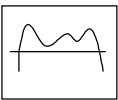
**GEQ/PEQ:** ARK-70 offers for each input a 29-band graphic equalizer with two choices of Q, the classical and a special algorithm, which adapts the Q in terms of how are the other filters, to get a smoother response and more optimal acoustics. For ARK-70 family it is also possible to switch the equalizer in PEQ mode, so that we will have 29 fully configurable parametric filters.

DELAY



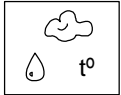
**DELAY:** Configurable delay. In the inputs A-B up to 211 msec. for covering a distance up to 73 m. For the inputs C-D up to 54 msec, for covering a distance up to 18 m It is mainly useful when working with important PA equipment covering a large distance with reinforcement blocs quite far from the stage. It allows 20 msec at outputs, which correspond to 7 meters approximately. Thanks to that function, it is possible to rectify the cabinet's position (alignment) in a multi-way equipment and avoid cancelling problems due to phase cancellation effects.

PEQ



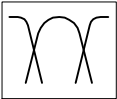
**PEQ:** Output equalisation. There are 9 filters completely configurable per output. These filters can be parametric, 6dB/oct. and 12dB/oct. low frequencies Shelving (with or without Q), 6dB/oct. and 12dB/oct. high frequency Shelving (with or without Q), 12 dB/oct. highpass and lowpass, bandpass, reject band and first and second order Allpass filters. Its aim is to provide a final equalisation on each way of the equipment.

Air Absorption Compensation



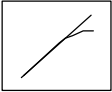
**AIR ABSORPTION COMPENSATION:** Apply the compensation curves necessary to restore the levels of the frequencies absorbed by the air with distance. These vary with temperature, humidity and distance, following the laws of physics. An indispensable tool for live events.

CROSSOVER



**CROSSOVER:** Bands separating filters. Different filters are available: Linkwitz-Riley, Butterworth and Bessel up to 48 dB/oct. It is also possible to put them in By-pass without affecting the corresponding way to have full bandwidth output.

RMS DYNAMIC



**DYNAMIC:** Dynamic section. The **ARK-70** offers a sophisticated RMS compressor-limiter, plus a peak limiter on each output. Limiters and compressors are C.R.I. type (Continuous Increment Ratio) for low distortion.

PEAK LIMITER



First using a RMS detector for a high-quality compression. The system will reach its maximum power gradually and the sound is perfectly crisp and clear at all times, avoiding the usual problems of normal limiters. Then we have the peak limiter which can control the maximum mechanical displacement in speakers. Also available is a noise gate that will respond with the same timing as the RMS dynamics and you can select different thresholds of noise to remove.

On the ARK frontal can see when a way is limiting because **LIMIT LED** lights. We also have a second **LED + L**, which lights up when we have exceeded a certain amount of compression. This over-limitation value may be set by the user to the desired level from the global configuration of the processor.

## 4.- OPERATING INSTRUCTIONS.

### *How to proceed.-*

#### a.- Before switching on the processor:

**ARK** includes a precise switching power supply. That means that it can adapt itself to any input supply voltage from 84 and 264 volts and frequencies from 50 to 400 Hz. This is the reason why the processor is guaranteed to work perfectly under any voltage and the final sound quality is completely independent of the supply voltage or the kind of generator used. Nevertheless it is recommended to check the supply voltage before working to avoid any possible problem when connecting at 380 volts. A fuse holder is included in the **ARK** processor with a spare fuse (1 A) situated in the IEC connector input of the power supply connector.

It is recommended to turn off the volume of all the power amplifiers down to 0 before switching on the processor. We will then be able to check whether any of the 4 processor outputs are connected to their corresponding power cabinets, avoiding any irretrievable damage in the loudspeakers (specially in expensive high frequencies drivers).

In any installation, it is suitable to place audio and lighting systems in independent power lines to protect both parts separately and to avoid interferences between the different equipments.

#### b.- Once the processor is ON:

When switching on the **ARK** processor, audio outputs remain short-circuited to ground for a few seconds in order to avoid the dangerous start up transient time necessary for the processor to receive a stable voltage and to check internal functions such as: good running of the converters, working memory checking, DSP processors start-up and current configuration loading. Subsequently, if everything is correct, all the outputs will commutate at the same time introducing audio in each output with a soft-start (The audio will be increased until reaching the value set in the preset).

### *Display, buttons and encoders.-*

**ARK** processors come, for programming all functions, with 24 characters and two lines LCD display, as well as a series of navigation buttons and encoders for real-time modification of various parameters. Despite being able to modify any parameter, **it is recommended to use the ARK software for better viewing of EQ curves and ease of programming.**

#### **DESCRIPTION OF THE MUTE/EDIT BUTTONS:**

Using these buttons can mute either input A, B, C or D, as well as outputs 1-8. Inputs or outputs muted will be red illuminated continuously. In the case that we have entered into the edit menu, these push buttons will help us to select the input or output for editing. The input or output editing will blink in red.



**NAVIGATION BUTTONS DESCRIPTION:**

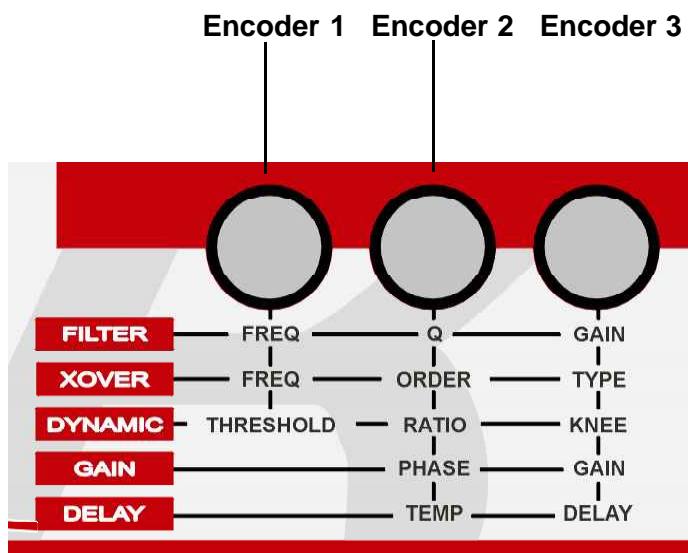
The navigation buttons allow modification of menu items and move by menus and submenus.



- UP:** Increase the number of menu.
- DOWN:** Decrease the number of menu.
- OK:** Provides access to menus and submenus and confirm their actions
- LEFT:** To exit from the Menu and move to the left on the options that allow it.
- RIGHT:** To move right into the options that allow it.

**ENCODERS DESCRIPTION:**

The encoders provide us with a direct access to different parameters that can be modified. Depending on the menu where we are, these encoders will have different parameters associated.



In the silk-screen printing of the frontal you can see associations, helping the user and facilitating programming.

- If we are in the equalisation menus, the encoder 1 will change the frequency of the current filter, the encoder 2 the Q and the encoder 3 the gain.
- If we are in the crossover, the encoder 1 will change the cutoff frequency, the encoder 2 the slope or filter order (-6, -12, -24, -48 dB) and the encoder 3 type filter.
- If we are in the dynamics, the encoder 1 change threshold limiting, the encoder 2 compression ratio and encoder 3 knee of the compressor / limiter.
- For the gains the encoder 1 has no association, the encoder 2 will amend the polarity and encoder 3 the gain.
- And the delay, the encoder 1 has no association, the encoder 2 will change the global temperature and encoder 3 the own delay.

## Program Menus.-

**ARK** Processor has an LCD Display in which there are various configuration menus to store and modify the operation of processor options and to protect stored data and access to them.

These menus are:

- 1.- File
- 2.- Edit
- 3.- Password
- 4.- Settings
- 5.- Firmware


In each, there are a number of submenus that allow complete and easy configuration of processor operating parameters.

When switching the processor, the start menus appears:



ARK- 70xx Processor  
Loadi ng DSP program. . .

Load the DSP program.



ARK- 70xx Processor  
Cal cul at i ng Preset. . .

Calculate and send preset data to the present DSP.



1. No Name  
Press OK to enter

Initially in the first line shows the memory number and name of the current program.

Pressing the function key **OK** allows you to enter the detailed configuration of the functions of the processor.

### 1.- FILE


The **File** menu is the first to find when you press the function key **OK** after the welcome menu. Permits execute stored memories, create new or save the one we edited. **ARK** has 50 memories in which to store our settings.

#### Submenu 1.1. Open Preset.-



1. File  
1. 1 Open Preset

From the File menu, pressing **OK** , entered the Open Preset option. If we press **OK** we will select the memory we want to load using the up and down keys. Memory number will be displayed and the name of the preset selected. If we accept, the memory will be loaded and the following screen appears.



1. 1 Open Preset  
Cal cul at i ng Preset. . .

**Submenu 1.2. Save As.-**

```
1. File
1.2 Save As..
```

```
3: Preset 3
Save into preset: 3
```

```
Preset Name: Preset 3
xxxxxxxxxxx
```

```
3: Preset 3
Saving Preset..
```

Increasing to the next option from the File menu, we find the submenu "Save As". From here we can save the preset memory that we have active. If we accept, we have to select the number asked where to save. At the Top it indicates the name of the memory where we will overwrite.

After this it will ask the name we want to put into the memory. In the first line appears the old name and below the new we're going to give. We scroll through the different characters with the navigation keys Left, Right and change its value with the up and down, or also using the encoder 3. When accept will save it.

**Submenu 1.3. New Preset.-**

```
1. File
1.3 New Preset
```

```
1.3 New Preset
Bl ank Project?
```

```
1.3 New Preset
Current Project?
```

```
3: Preset 3
Save into preset: 3
```

```
Preset Name: Preset 3
xxxxxxxxxxx
```

```
3: Preset 3
Saving Preset..
```

In the next submenu, we find the option to create a new preset. Upon entering we were asked if we start from a blank configuration, or from the current preset, changing up and down, we alternate between the two options.

Following this, we will confirm, and it will request the memory number and name to save it. The steps are the same as "save as".

## 2.- EDIT

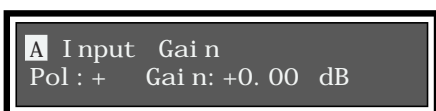
From the **Edit** menu you will have access to all processor functions and from here can modify any parameter in real time such as filters EQ, crossover, delay, gains, polarity, limiters ... At any time during editing we can change the output to be edited using the MUTE / EDIT buttons placed under the vumeters.

Inside this menu we have the following submenus:

- 2.1 - Input Gain
- 2.2 - Input Equalization
- 2.3 - Input Delay
- 2.4 - Route
- 2.5 - Crossover
- 2.6 - Output Equalization
- 2.7 - Output Gain
- 2.8 - Output Delay
- 2.9 - RMS Dynamic
- 2.10- Noise Gate
- 2.11- Peak Limiter
- 2.12- Signal Generator
- 2.13- Labels

### Submenu 2.1. Input Gain.-

If we press **OK** we move to submenu **Input Gain**, from which we can change the gain and polarity of the input selected using the push buttons A, B, C and D.

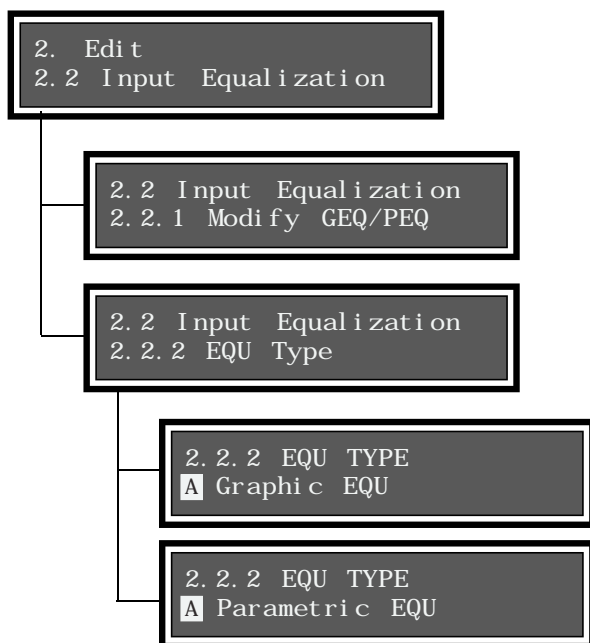


Pressing **OK** we access the next window, in which we can modify with **encoder 2 the polarity** (positive or negative) and with **encoder 3 the gain** of the selected input (from -40 dBu to +6dBu). At the top-left of the display shows the Input in which we are. The A, in this case. Any movement of the encoders will be sent in real-time to DSP.

To exit from this sub menu just press **OK** or **←**

### Submenu 2.2. Input Equalization.-

If we press the Up key we move to the **Input Equalization** submenu, from which we can adjust the Equalization for inputs A, B, C and D. The ARK-70 processors have available 29 equalization bands in graphical mode for each input, and also, if selected, 29 parametric filters.

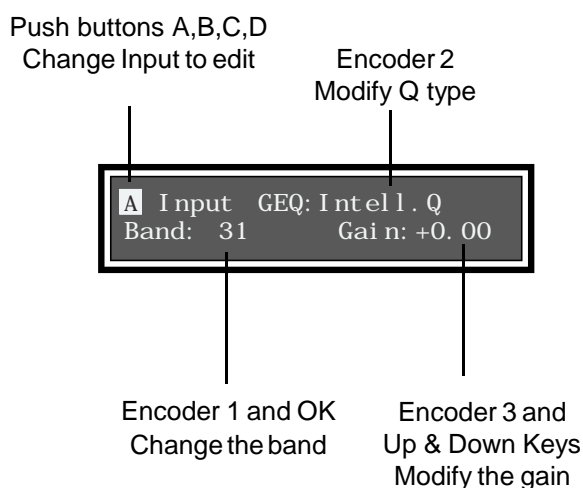


Pressing **OK** will access to the next window.

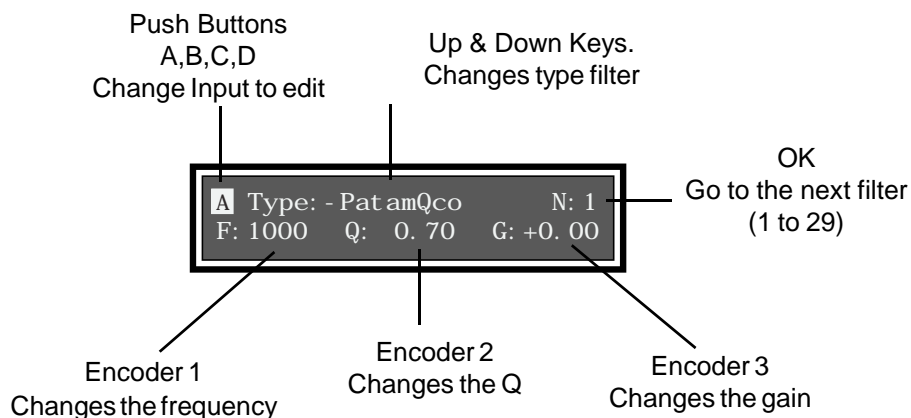
On this we can modify the equalization (menu 2.2.1) if we press again **OK**, or change the **EQU Type** (menu 2.2.2) if we press Up and after **OK**.

The two options are: **Graphic EQU** or **Parametric EQU**.

If we entered into menu **2.2.1 Modify GEQ/PEQ** and type is **Graphic EQU**, we can modify the 29 equalization bands. These are separated in third of octave. The center frequencies are: 31, 40,50,63,80,100,125,160, 200,250,315,400,500,630,800,1K,1K25,1K6,2K, 2K5, 3K15, 4K, 5K, 6K3, 8K, 10K, 12K5, 16K, 20KHz.



If we entered into menu **2.2.1 Modify GEQ/PEQ** and type is **Parametric EQU**, we can adjust up to 29 filters per way. The controls description its detailed below:



### Submenu 2.3. Input Delay.-

From menu **Edit** will push Up key to move to submenu **Input Delay**, from which we can change the delays for inputs A, B, C y D.



Delay in milliseconds

Delay in meters

Pressing **OK** will access the next screen, in which we can modify with **encoder 3** the **delay** of the selected input. This will increase from 0 to 212ms (73 meters at 25°C) for inputs A-B, and from 0 to 54ms (18.8 meters at 25°C) for inputs C-D.

With **encoder 2** we can change the **environment temperature**.

### Submenu 2.4. Route.-

If we press the **UP** key from the **Input Delay** submenu, we will move to **ROUTE** submenu, from here we can select from where we take the input signal on every output.

```
2. Edit
2.4 Route
```

```
2.4 Route
1 [Out 1]: A
```

Again we enter the submenu by pressing OK, in which we choose the desired input signal for the selected output, in this case 1. We can choose that takes the signal from inputs A, B, C, D as well as mono A+B, C+D (for inputs A+B and C+D the input gain decrease to -6dB automatically, to compensate the sum of both channels). We will change the route selection using **UP** and **DOWN** keys.

The processor will show in brackets the name we have assigned for such outputs with ARK software or through the menu **2.13 Labels**.

```
2. Edit
2.4 Route
```

Pressing **OK** or Left key  return to previous menu.

### Submenu 2.5. Crossover.-

If we press the UP key from the **Route** submenu, we will move to **Crossover** submenu.

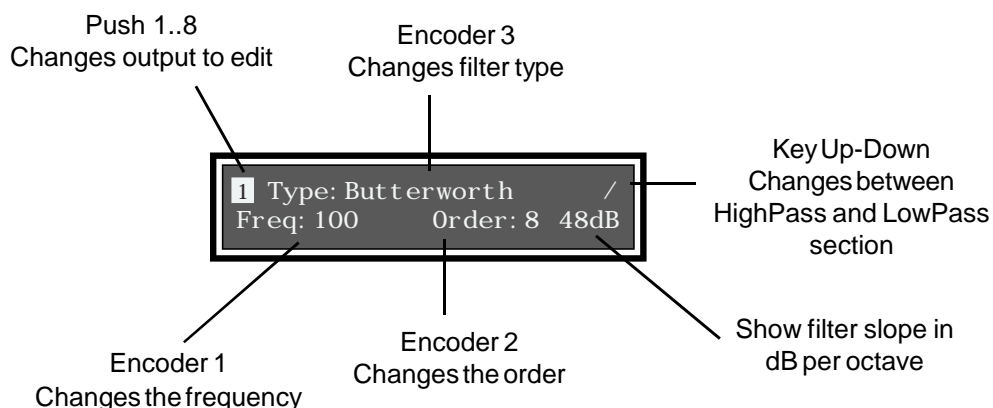


Pressing **OK** we can configure the crossover filters, both in low pass as high pass.

Frequencies ranging from 10Hz to 20KHz, the order will be 1 to 8 or equivalent, filter slopes from 6 to 48 dB per octave.

The available filter types are: Butterworth, Linkwitz Riley and Bessel.

The controls description its detailed below:

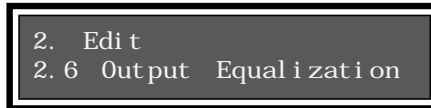


Pressing **OK** or exit key **◀** return to previous menu.

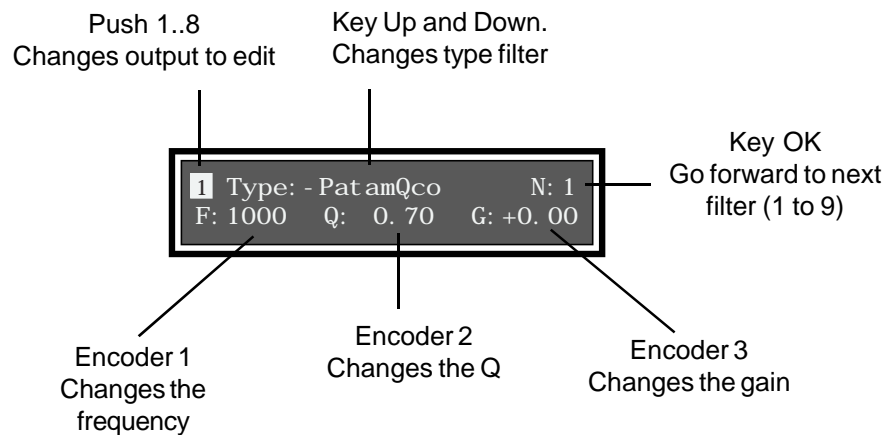


### Submenu 2.6. Output Equalization.-

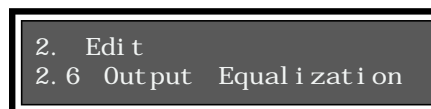
If we press Up, we will move to the **Output Equalization** submenu, from which we can set the equalizer outputs 1, 2, 3, 4, 5, 6, 7 and 8.



Pressing **OK** will access the next screen from which we can set up to 9 filters per way. The controls description is detailed below:



Pressing **OK** or exit key  return to the previous menu.




### Submenu 2.7. Output Gain.-


If we press Up, the key we will move to the **Output Gain** submenu, from which we can modify the gain and polarity of the selected output via push buttons from 1 to 8.



```

2. Edit
2.7 Output Gain
  
```

Pressing **OK** will access the next screen, in which we can modify with **encoder 2 the polarity** (positive or negative) and with **encoder 3 the gain** of the selected output (from -40 dBu to +6dBu). The top-left of the display shows the output in which we are. 1, in this case. Any movement of the encoders will be sent in real-time to the DSP. To exit from this sub menu just press **OK** or exit 



```

1 Output Gain
Pol: + Gain: +0.00 dB
  
```

### Submenu 2.8. Output Delay.-

From the previous menu we will press the **Up** key to move to the **Output Delay** submenu, from which we can modify delays in outputs 1, 2, 3, 4, 5, 6, 7 and 8.



```

2. Edit
2.8 Output Delay
  
```



```

1 Output Delay 25^C
Delay: 20.83ms 7.35m
  
```

Delay in milliseconds

Delay in meters

Pressing **OK** we will access a new screen, in which we can modify **Delay** for the selected output with **encoder 3**. This range will be from 0 to 20.83ms (7.35 meters at 25°C) for each output.

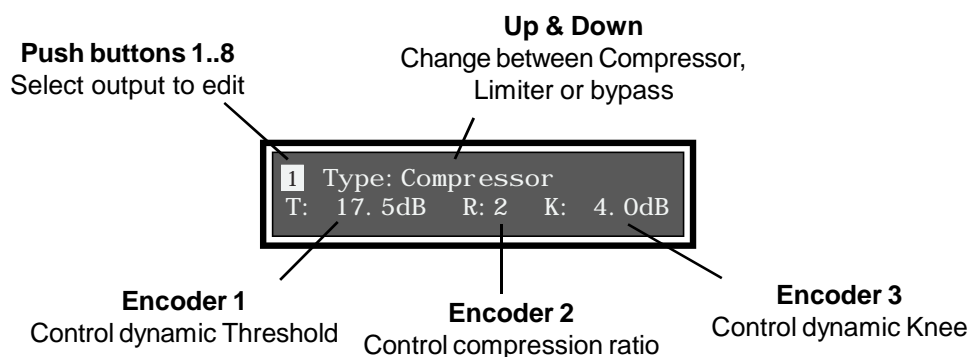
With **encoder 2** we can change **environment temperature**.

### Submenu 2.9. RMS Dynamic.-

From the previous menu will press the **UP** key to move to the **RMS Dynamic** submenu, from which we can configure the compressor/limiter for outputs 1, 2, 3, 4, 5, 6, 7 and 8.

```
2. Edit
2.9 RMS Dynamic
```

Pressing **OK** will access the next screen, in which we can modify the **dynamic threshold** with **encoder 1** for the selected output. The range is from +18 dBu to -50 dBu. With **encoder 2** will control the **compression ratio**, that will go from 1:1 (no compression) to 1:10 (for each 10 dB upper the threshold, the output takes 1dB). With **encoder 3** we can change the **limiter knee**. For the limiter case, the compression ratio will not be displayed, because it is equivalent to a ratio 1: infinity. With **Up and Down Keys** we change dynamic type: compressor or limiter.



If we press the right key **▶** will move to configure the RMS dynamic times.:

**Encoder 1**  
set the attack speed when the signal exceeds the threshold.

```
1 Attack: 120dB/s
  Hold: 40ms      Rel: 7dB/s
```

**Encoder 2**  
Set the hold time after lowering the threshold.

**Encoder 3**  
Set the release speed, after spending the hold time.

### Submenu 2.10. Noise Gate.-

From the menu "RMS Dynamic" we have to push the **UP** navigation button in order to go into the submenu **Noise Gate**. Then we can adjust the noise gate for outputs 1, 2, 3, 4, 5, 6, 7, and 8.




2. Edit  
2.10 Noise Gate

Pushing **OK** we can access the next window. Then we can use the **encoder 3** and modify the **Noise gate level** in the selected input. This level is from -79dBu to -37dBu, or switch off (bypass). This value will be the noise threshold to be deleted. For example, if we adjust to -79dBu then the gate could delete noise from -80dBu to down, and when the noise level will surpass -79dBu then the gate will be opened. The opening and closing times are fixed by the Dynamic RMS attack and release times of this output.

#### Push buttons 1..8

Select the editable  
output



1 Noise Gate Level  
Level : -79dBu

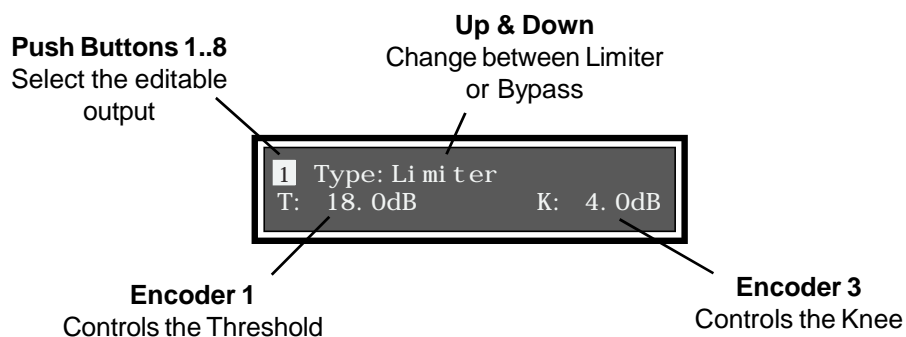
**Encoder 1**  
Controls the Threshold


### Submenu 2.11. PEAK Dynamic.-

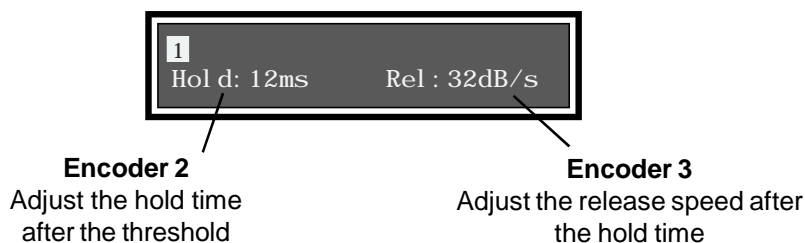
From the menu "Noise Gate" we have to push the **UP** navigation button in order to go into the submenu Peak Limiter. Then we can configure the **Peak limiter** for outputs 1, 2, 3, 4, 5, 6, 7, and 8.




Pressing **OK** we can access the next window. Then we can use **encoder 1** and modify the **Limit Threshold** in the selected input. This level is from +18dBu to -50dBu. And with the **encoder 3** we can change the **knee**. With keys **up and down** we can choose the type: Limiter or bypass.



When we push the right key  then we can configure the RMS Dynamic times:



With the left key  we will return to the previous window.

### Submenu 2.12. Signal Generator.-

From the submenu "Peak Limiter" we have to push the **UP** navigation button in order to go into the submenu **Signal Generator**. Then we can insert a signal generator over all the inputs. In this case the audio input is disconnected.

```
2. Edit
2.12 Signal Generator
```

Pressing **OK** you can access to the submenu.

```
2.12 Signal Generator
Tone: 1000Hz G: -20dB
```

If you push **UP** then you will activate the sinus generator:

```
2.12 Signal Generator
Tone: 1000Hz G: -20dB
```

**Encoder 1**  
Adjust the sin frequency


**Encoder 3**  
Adjust the sin level

When we push **UP** again then we activate the white noise generator:

```
2.12 Signal Generator
White Noise G: -20dB
```

And if we push **UP** again then we activate the pink noise generator:

```
2.12 Signal Generator
Pink Noise G: -20dB
```

At any time, when we want to go out just press the **LEFT** key 

### Submenu 2.13. Labels.-

From the submenu "Signal Generator" we have to push the **up** navigation button in order to go into the submenu **Labels**. Then we can edit all the names assigned to each input and output, including the preset name.

2. Edit  
2.13 Labels

Preset Name: No Name

Preset Name: No Name  
No Name

Input **A** Name:  
InLeft

Output **1** Name:  
Hi ghL

Once we press **OK**, the first thing we can do is edit the preset name.

If we press **OK** again then we can change the name. With **LEFT** and **RIGHT** we have to select the character we want to change. Then using **UP** and **DOWN** or the **Encoder 3** we can change this character. If we want to save the changes then press **OK**.

If we push A, B, C, or D, we will go the next window. In this one we can assign an Alias name to the input. We have to push **OK** to enter Use again the keys **UP**, **DOWN**, **LEFT** and **RIGHT** to change the name, just following the same process used in the previous window..

If we push 1,2,3,4,5,6,7 or 8 we can assign an Alias name to one of these outputs.

All these Alias/nicknames assigned to the inputs and outputs will be a reference very useful in the different edit windows. In this case when in input A, you will see it's name, as displayed in the **ROUTE** window:

2.4 Route  
**1** [Hi ghL]: **A**

### 3.- PASSWORD

From the menu "Password" we can activate a security password to avoid other users having access to the processor.



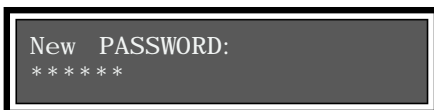
If we push **OK** the window will indicate that the password is disabled (OFF)



If we push again **OK**, then we can enter the password (if we push OK by mistake we can exit using the key ).



In order to introduce the password we have to use the **encoder 3**. Push **OK** to change to another character until the six spaces are completed.



The manufacturer password by default is: "AAAAAA". Even this password is not activated, once you decide to activate your password you have to input "AAAAAA". This is just to avoid that other person activate the password by mistake. Then you can enter your own password. A lock icon will appear.

**Keep this password in a safety place, you will need it each time you access into the configuration of the ARK processor (from the front pannel and also from the software).**



In order to **disable the password**, enter again into this menu (it will request the password). Now show **Password ON**,



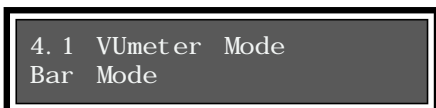
push **UP** to change to **OFF** Then push **LEFT** to exit .



The lock icon will disappear from the display.

4.- SETTINGS

In this menu and submenu the user can configure some of the global options of the processor.

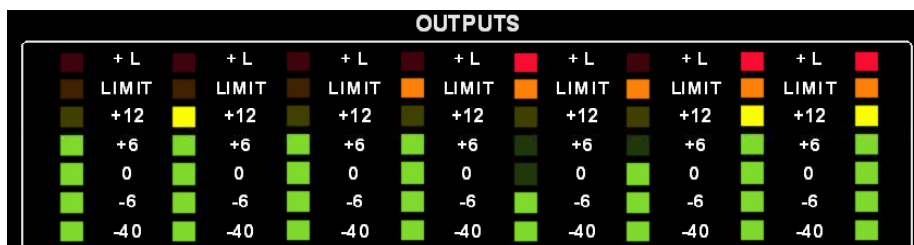


Submenu 4.1. VUmeter Mode.-

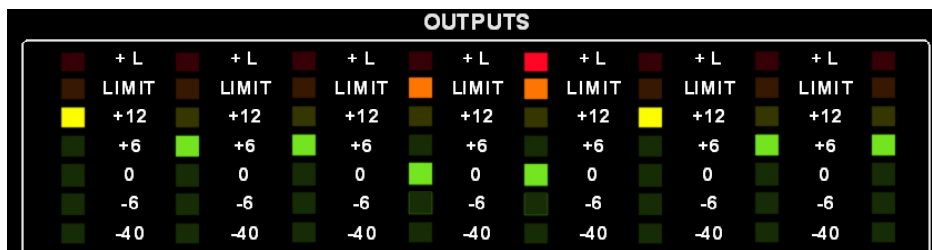
We can decide how to light the Vumeter leds.

Push **UP** to select **Bar Mode** and push **Down** to choose **Peak Mode**.

The **Bar Mode** will show a bar of various leds corresponding to the level reached, as you can see in the following example:










In the **Peak Mode** it will only show the led corresponding to the peak level, as you can see in the following example:



The leds of Limit and Over-limit will be on in both cases.

**Submenu 4.2. Over Compression LED.-**

Here we can choose how many dB's have to surpass the compression limit to light the red led +L from the vumeter.

	+ L
	LIMIT
	+12
	+6
	0
	-6
	-40

4. Settings  
4.2 Over Compression LED

4.2 Over Compression LED  
Lights from +3 dBu comp

The configuration by default is +3 dBu. In this case the red led will be ON when the limit threshold overpasses 3 dB's. You can configure this data with **encoder 3** and select up to +40 dBu.


## 5.- FIRMWARE

In this menu we can consult the firmware version and it's release date.



5. Firmware

When we push **OK** the display will show this information:



VMB Espanola, SA  
v4.0 May 27 2010

## 5.- TECHNICAL SPECIFICATIONS .

### Input 2 / 4

Impedance: 20 K Ohm Balanced (10 K Ohm unbalanced)  
 Connector: Balanced XLR (pin 2 +)  
 AD converter: 24 bit-192KHz, 512x Oversampling  
 Dynamic Range: 120 dB  
 Max. level: +19 dBu (balanced).  
 Digital AES/EBU: Optional.

### Outputs 4 / 6 / 8 (ARK-7024 / 7044 / 7026 / 7048)

Impedance: 50 Ohm Balanced (25 Ohm unbalanced)  
 Connector: Balanced XLR (pin 2 +)  
 DA converter: 24 bit-192KHz, 512x Oversampling  
 Dynamic Range: 120 dB  
 Max. level: +18 dBu (balanced)  
 Digital AES/EBU: Optional.

**Ethersound** Optional.

### Audio

Frequency Range 10 Hz – 24 KHz  
 THD (%) <0,0018%  
 DSP Process Internal resolution with 56 bit double precision in floating point  
 Converters 24 bit resolution  
 Propagation Delay: 0.6 milliseconds

### Equalisation

Input GEQ / PEQ 29 GEQ Bands or 29 parametric filters per input  
 PEQ output 9 per way  
 PEQ Type filters Parametric, Shelving High, Shelving Low, Low-Pass, High-Pass, Low-Pass Q variable, High-Pass Q variable, BandPass, Reject Band, AllPass order 1, AllPass order 2.  
 Possibility to Link filters between Input and Outputs.

### Crossover

Linkwitz Riley with 12, 24, 48 dB/oct.  
 Butterworth and Bessel with 6, 12, 18, 24, 30, 36, 42 and 48 dB/oct.

### Delay

Input 54.15 / 190 milisec  
 Output 20.8 milisec for Speaker's alignment  
 Possibility to Link Delays.

### RMS Limiter-Compressor

1 per output.  
 Threshold: +18dBu to -50dBu  
 Compression Ratio: 1:1 to 1:10 (1:infinite with limiter)  
 Power indication Shows the maximum power applied to the speaker for the selected threshold.

### Peak Limiter

1 per output.  
 Threshold: +18dBu to -50dBu.  
 Peak Indication: Shows the maximum peak Voltage applied to the speaker for the selected threshold

### Noise Gate

1 per Output  
 Noise Threshold: -79dBu to -37dBu.

### Level Control

Gain +6dBu to -40 dBu per input / output  
 Mute per input / output  
 Phase inversion per input / output  
 Possibility to Link Controls.

### Signal Generator

Level 0dBu to -40dBu  
 Type: sin tone from 10Hz to 22KHz, Pink noise, White noise.

### Security Options

Password global  
 Level 0: All controls unlocked.  
 Level 1: Only permits to change presets.  
 Level 2: Only permits to modify Mutes.  
 Level 3: Permits to change presets and modify Mutes.  
 Level 4: All frontal controls locked.  
 Restricted Zones: For each Preset it is possible to disable the access to any processor function (EQ, crossover, Limiter, etc) writing a preset password.

### Other functions:

Atmospheric compensation by Air absorption.  
 Process Integration with RAINBOW – The acoustical prediction software  
 Speaker data import from main audio measurement systems.  
 Export & Import EQ files  
 Etc.

### Front Panel

Display: LCD with 24 x 2 characters.  
 Encoders: 3  
 Buttons: Navigator with 5 backlight buttons  
 12 buttons for Edition and Mute with light indications  
**Level Meter:** 7 leds per input/output, -40db, -6db, 0db, +6db, +12db, Limit, Over Limit

### Communication USB

Ethernet.

### General

Power supply 85-240 V ~ 40-400 Hz. IEC connector.(Switching power supply, wide range)  
 Consumption 30 W

Operating temperature: -5° to 60° C (23° to 140° F)  
 Storage temperature: -60° to 75° C (-76° to 167° F)  
 Humidity: Max. 90% non-condensing

**Dimensions** 482 x 45 x 226 mm

**Weight** 3 Kg

**Warranty** 3 years

## 6.- TROUBLESHOOTING

In this section we try to give solutions to possible problems:

### 1 – The processor does not start up:

Check the power supply cord. If it is correctly connected and the red led on the front panel does not light on, check the fuse situated in the input of the power cord.

### 2 – The processor starts up but there is no sound:

Check that the processor is being provided with a signal in the correct input, A, B, C or D. If the signal does reach the processor, the green signal LED will light.

### 3 – The resulting sound is “strange”:

Check that the 4 outputs and their corresponding cabinets are correctly linked. Always be careful in increasing little by little the cabinets volume channel by channel in order to check the correct connection and not to damage the transducers.

### 4 – One of the cabinets ( with the same signal ) sounds less than the others:

Check that the joining cable from the processor to the cabinet is well balanced otherwise the output signal will fall 6 dB.

### 5 – Audio sounds wrong and distorted.

Verify that we are not saturating the input (beyond the 19 dBu input). In this case the LEDs light up red clip. Sufficient to reduce the input signal to the processor, until no clip LEDs light up. If this does not work, verify that the signal is not distorted out from the previous gear, for example the mixer, which could be the gain of that channel very high and saturating the mixer input.

### 6 – Buttons or encoder do not work.

Verify if there is any keyboard lock activated from the software.

### 7 – I can not connect by Ethernet.

Check that the USB cable is not connected, it has priority and internally disables the Ethernet connection. If this is not the case read Annex Ethernet in the software manual.

## 7.- GUARANTEE

VMB's products are guaranteed against every kind of manufacturing defect for 1 year after the date of sale.

When products are under guarantee, the repairing and the free supplying of the defective parts in order to correct any kind of defect are guaranteed by VMB.

In the case that the product could not be returned to the factory for checking and repairing, VMB would supply all the necessary parts after identification of the original owner of the product or the authorized seller.

VMB is not responsible for any damage or defect caused during the transport or caused by an undue or improper handling a non-authorized person during the life of this guarantee.

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