



# DMM 8008

Digital Matrix Mixer 8 in - 8 out

USER MANUAL  
ver. 1.2

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## IMPORTANT SAFETY INSTRUCTIONS



### WARNING

RISK OF ELECTRIC SHOCK  
DO NOT OPEN



TO REDUCE THE RISK OF ELECTRIC SHOCK  
DO NOT REMOVE COVER (OR BACK)  
NO USER SERVICEABLE PARTS INSIDE  
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK  
DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE



WHERE MARKED, THIS SYMBOL INDICATES A DANGEROUS NON-ISOLATED VOLTAGE INSIDE THE LOUDSPEAKER: SUCH VOLTAGE COULD BE SUFFICIENT TO RESULT IN THE RISK OF ELECTRIC SHOCK



WHERE MARKED, THIS SYMBOL INDICATES IMPORTANT USAGE AND MAINTENANCE INSTRUCTIONS IN THE ENCLOSED DOCUMENTS. PLEASE REFER TO THE MANUAL

## PRECAUTIONS

- For proper air ventilation please make sure to leave sufficient clearance (min. 11 inch.) on all sides of the device.
- Please do not cover the ventilation slots with papers, table cloths, curtains, etc. in order not to prevent ventilation of the device
- Please do not place any naked flame source, such as lighted candles, on the device.
- Please keep the device away from water springs and splashes and please do not place any objects containing liquids, such as vases, on the device.

## INSTALLATION

- When the unit is installed in a rack enclosure, the rack must have all the prerequisites required by the EN 60439-1 standard, in particular the rear part must be closed by means of suitable panels.

## CONNECTIONS



- Before using the amplifier make sure that the appliance's voltage is in accordance to your mains supply. Connect the amplifier only to grounded mains outlets.
- The unit must only be supplied from the mains after all connections have been completed.

## ITEMS SUPPLIED



This product is supplied with the following items:

- AC power cord
- Removable terminal plugs
- USB adapter
- Setting software CD with user manual

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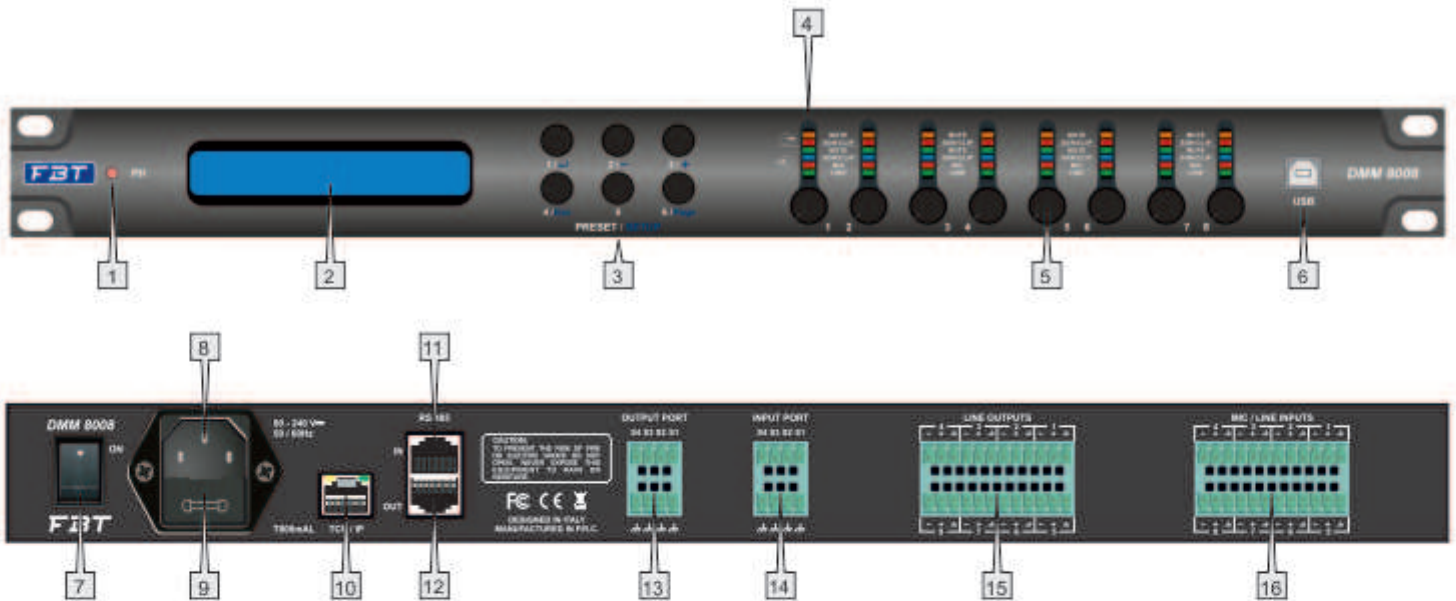
## 1. OVERVIEW

### 1.1 MAIN FEATURES

The **DMM 8008** is a high performance 8 input x 8 output digital matrix mixer; specially designed for commercial and professional applications such as conference rooms, auditoriums, sport utility buildings, house of worship, pubs and disco. It includes 8 independently switchable Line/Mic inputs with Phantom power supply, 8 line outputs, managed by a powerful 48kHz / 24 bit DSP engine, in addition to high performance 24 bit AD/DA converters. The **DMM 8008** supports a full matrix mixing mode where inputs may be routed/mixed in any ratio to any output. Each Mic/Line input channel provides Lo/Hi pass 1st order filters, 3-band parametric EQ, Noise Gate function and Gain control. In addition Mic inputs include a Feedback Eliminator function, based on a powerful «pitch shifting» algorithm, particularly suitable for voice applications. Automixing function automatically adjusts input level to make operating easier using either NOM (Number of Open Mics) attenuation function or Gain sharing algorithm. In addition Ducking process enforces a «priority order» of open microphones in order that high priority inputs attenuate lower priority inputs. Each output offers up to 5-band of parametric equalization, crossover filters, RMS compressor, Peak limiter, Phase and Delay controls; 8 digital In/Out ports are provided for general purpose ( preset recall, trigger third parts or device ); 8 front knobs provides a quickly way to control input Gain; Up to 32 units can be managed by software applications.



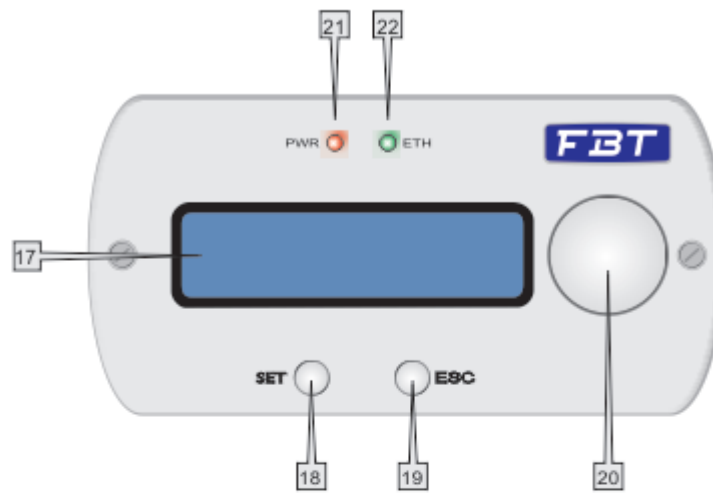
## 1.2 FRONT / REAR PANEL



- 1> LED PHANTOM POWER: lights up when the phantom power supply for the microphone inputs is switched on
- 2> 2 x 24 LCD display
- 3> Buttons PRESET 1/6: for retrieving the configurations previously saved; to call up the system setting menu
- 4> Status LEDs for the input/output channels:  
 Ch1 - Ch8:  
 MUTE - output mute condition  
 SGN/CLIP - output signal (blink in clip condition)  
 MUTE - input mute condition  
 SGN/CLIP - input signal (blink in clip condition)  
 MIC - input set as Mic  
 LINE - input set as Line
- 5> Mic input channel knob: allow to increase/decrease the gain of the mic inputs
- 6> USB jack type B: to connect a computer for remote control and for configuration of the DMM 8008
- 7> POWER switch
- 8> Mains jack: for connection to a socket (90-240Vac / 50-60Hz) via the mains cable supplied
- 9> Support for the mains fuse; always replace a blown fuse by a fuse of the same type
- 10> RJ45 jack TCP/IP: to connect a computer for remote controlled operation of the DMM 8008 via Ethernet; the two LEDs above the jack indicate that the connection is being established or that data is being transferred
- 11> RJ45 jack RS485 IN: to connect a computer for remote controlled operation or to connect the remote control panel WP 8008
- 12> RJ45 jack RS485 OUT: to connect an additional unit to be remote controlled by the computer that is connected to jack RS485 IN
- 13> Switching outputs S1 - S4 as screw terminals
- 14> Switching inputs S1 - S4 as screw terminals to retrieve the extra configurations previously saved
- 15> Balanced audio signal outputs Ch1 - Ch8 as screw terminals
- 16> Balanced audio signal inputs Ch1 - Ch8 as screw terminals

---

### 1.3 WALL PANEL



17> 2 x 16 LCD display

18> SET button allows to confirm the selection

19> ESC button allows to come back without confirm

20> Encoder allows to scroll available selections

21> Power indication LED

22> RS485 indication LED



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## 1.4 CONNECTION

### 1.4.1 INPUTS

Connect line-level signal sources, e.g. the output of a preamplifier or of a mixer, to the screw terminals INPUTS CH1-CH8 (16). The connections are provided for balanced signals. To connect unbalanced signal sources, connect the contacts «-» and «gnd». Alternatively, connect microphones to these terminal screws. Use the computer to configure the respective input as a microphone or line input. This procedure can also be used to provide all microphone inputs with a phantom power supply of 48V. In this case, only microphones with balanced signal outputs can be connected. Microphones with unbalanced outputs may be damaged by the phantom power supply.

### 1.4.2 OUTPUTS

Connect the amplifiers, monitoring systems or other units for further signal processing to the screw terminals LINE OUTPUTS Ch1 - Ch8 (15).

### 1.4.3 GENERAL PURPOSE I/O

Use the four switching inputs to retrieve special configurations (extra programs). Connect the units that are to be used as switching units to the screw terminals INPUT PORT "S1" to "S4" (14) and the corresponding ground terminals. A switching voltage of +5V is required. The logic type and the priority between the four inputs can be configured via the computer. Four switching outputs with a switching voltage of +5V are available for controlling other units. Connect the switching inputs of these units to the screw terminals OUTPUT PORT "S1" to "S4" (13) and the corresponding ground terminals "gnd".

### 1.4.4 WALL PANEL WP 8008

The wall mount control panel WP 8008 (separately available as an option) allows users to operate the DMM 8008 by two configurable modes: Zone controller (only a single zone can be managed) and Global controller (can be managed all inputs and outputs).

Connect the terminals "485+" and "485-" located on the rear side of the operating panel to the appropriate contacts of the jack RS485 IN (11); to supply power to the control panel, connect the terminals "+12V" and "GND" to a regulated, unearthed DC voltage source of 12V (observe the correct polarity!).

**Note:** in order to enable the control panel to establish a data connection to the DMM 8008, only switch on the power supply for the control panel when the DMM 8008 has already been switched on. For mounting the control panel use a standard 503 recessed box.

### 1.4.5 COMPUTER

To operate the DMM 8008 by remote control via a computer, connect the computer to the jack (6) using a USB cable. Alternatively, the unit may also be controlled via the RS485 interface (provided the interface is not to be used for connecting the control panel WP 8008) or Ethernet. To control the DMM 8008 via the RS485 interface connect the RS485 output of the computer to the jack RS485 IN (11); the pin configuration is:



The output jack RS485 OUT (12) may be connected to the jack RS485 IN of an additional DMM 8008. Thus, up to 64 units to be controlled may be connected in a chain. If multiple units are connected and if longer control lines are used, the control output of the last unit in the chain should be equipped with a terminal resistor (120 Ohm resistor between pin 1 and pin 2 of the connection) to prevent interference while signals are transmitted.

To operate the DMM 8008 by remote control via Ethernet, the jack TCP/IP (10) may be used to connect the DMM 8008 to an individual computer, a local computer network or, e.g. via a router, to larger computer networks (internet). Network technology expertise is indispensable for the correct installation of the connection.


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## 2.0 OPERATION

### 2.1 OVERVIEW

The DMM 8008 can work as a stand alone unit [Stand Alone Mode], where up to 6 preset can be recalled by directly selecting them through the 6 "preset" buttons available on the front panel, or an work as completely remotely controlled unit [Remote Control Mode].


As soon as is turned ON the device will indicate the current Firmware version



DMM 8008  
Firmware version V1.1

and then will load the currently selected preset.

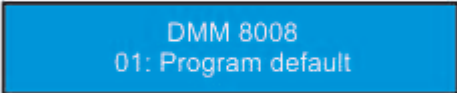
During the Preset Loading, the LCD screen will show the following:



Please Wait.....  
Loading new program.....

Here the unit is just checking if Presets are available on the Eeprom.


If not, the "Init" phase can last several seconds, and the Eeprom of the unit is initialized in order to guest later on the presets will be created by the user through the Pc Remote Control Sw.



DMM 8008  
01: Program default

If Presets are already available, then the "init" phase will be skipped and the currently selected preset will be loaded.

The preset loading can take approximately 14Seconds and will end with showing on the LCD the currently running preset's name:



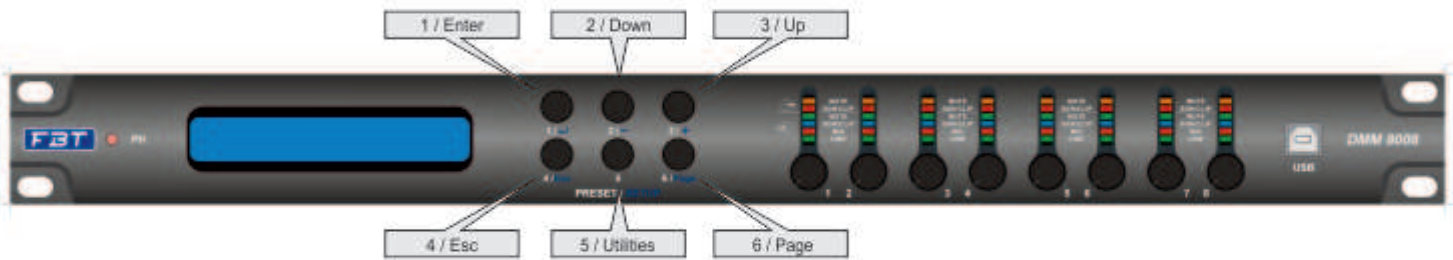
DMM 8008  
01: Current Preset Name



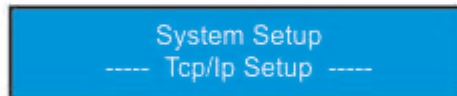
## 2.2 STAND ALONE MODE

When the DMM 8008 is operating as stand alone unit, so running one of the 6 available presets, previously created and stored within the unit with the remote control Pc Sw, the only available control are the 6 "preset buttons", allowing to select 1 of the 6 available presets previously stored through the Pc Sw Remote Control. The name of the currently loaded/running preset is displayed on the LCD screen.

Using the buttons on the front panel, a particular function called System Setup, can be accessed. For accessing the System Setup function, need to refer to the 6 available buttons on the front panel, as follow :



Referring to the Picture, in order to access the System Setup need to press the Button 5 / Utilities, for about 4 seconds, The following window will appear:



As the picture shows, in the System Setup mode the buttons 1/2/3/4/6 are used as Enter/Down/Up/Esc/Page commands, used for scrolling, accessing and editing the following 5 Menus:

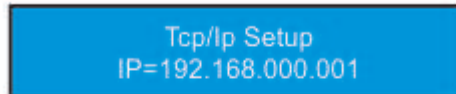
1. Tcp/Ip Setup
2. Output Switch Linked
3. Out Switch Setup
4. ID RS485 Setup
5. USB/RS485 Setup

From the first "Tcp/Ip Setup" Menu, just using the Up/Down buttons, the all other Menus can be accessed.

### 2.2.1 TCP / IP SETUP

Within this Menu, the User can set the DMM 8008 IP Address

From the Tcp/Ip Setup, pressing the Button 1 / Enter, the following sub-menu is entered:



Tcp/Ip Setup  
IP=192.168.000.001

Here, the first digit of the IP will be blinking, which means the User can modify the digit's value using the Up/Down buttons.

Once assigned the desired value to the digit, confirm it pressing the Enter button.

After a while, the system will automatically go to the second digit of the IP address, which will start blinking.

With the Button Page, a digit can be skipped without being modified, so using Page is possible to scroll into the all 4 digits of the IP Address, without the necessity to modify them.

The first digit of the IP Address can range from 1 to 223, the second and third digits can range from 0 to 255 and the fourth digit from 1 to 255.

The system will automatically compute the right "Sub Net Mask" value to assign to the Unit, once defined the IP address.

The Sub Net Mask values are the following:

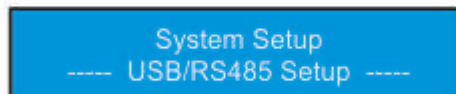
1. IP Address from IP=001.0.0.2 up to IP=126.255.255.254, SubNetMask = FF000000h (Class A)
2. IP Address from IP=127.0.0.2 up to IP=191.255.255.254, SubNetMask = FFFF0000h (Class B)
3. IP Address from IP=192.0.0.2 up to IP=223.255.255.254, SubNetMask = FFFFFFF00h (Class C)

Once set properly the IP Address, the Tcp/Ip setup Menu can be left using the Esc button.

### 2.2.2 USB / RS485 SETUP

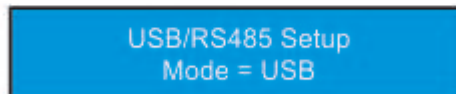
Within this Menu, the User can chose between the USB or RS485 connection type to be used for a remote control.

From the USB/RS485 Setup page



System Setup  
---- USB/RS485 Setup ----

pressing the Button 1 / Enter, the following sub-menu is entered:



USB/RS485 Setup  
Mode = USB

Here, the communication interface to be used can be selected: USB/RS485/Automatic.

The Tcp/Ip connection is EVER available.

In the USB mode, the DMM 8008 can be controlled via USB interface or via Tcp/Ip connection.

If selected, the USB interface will be active as default when the DMM 8008 is turned ON.

In the RS485 mode, the DMM 8008 can be controlled via USB interface or via Tcp/Ip connection.

If selected, the RS485 interface will be active as default when the DMM 8008 is turned ON.

If selected the Automatic Mode, the unit will continuously "switch" between USB and RS485 (each about 100ms), looking for an available Remote Control on one of the 2 interfaces.

Once found an available one, the DMM 8008 will communicate vi the interface corresponding to the one found.

If selected, the Automatic interface will be active as default when the DMM 8008 is turned ON.

The currently active connection type, will be displayed on the extreme right of the LCD's top row, with the U/R/A symbols (USB/RS495/Automatic)

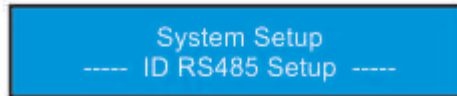


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### 2.2.3 ID RS485 SETUP

Within this Menu, the User can define the ID of the DMM 8008 when working with a remote control via RS485 interface.

From the ID RS485 Setup page



pressing the Button 1 / Enter, the following sub-menu is entered:



Here, the ID number of the DMM 8008 can be assigned.

The possible ID values range from 1 to 64.

The ID number can be selected using the Up/Down buttons.

The Enter button has to be used to SAVE the assigned ID number and exit the Menu.

The Esc button has to be used to exit the Menu WITHOUT SAVING the ID number.

### 2.2.4 OUTPUT SWITCH LINKED SETUP

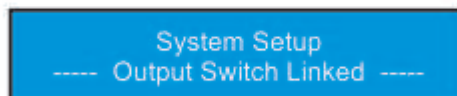
The DMM 8008 has internally the possibility to store up to 10 Presets "Switch" (Only by Pc Sw) and on each one of these presets is contained the Status of the Output Switch lines (Output Ports S1/S2/S3/S4) available on the DMM 8008 back panel.

These 10 presets can be recalled in LINK with the corresponding "Audio" Preset, by pressing one of the 6 Presets Buttons of the front panel (or just loading the presets by Pc), once the Output Switch Link function is set as ON.

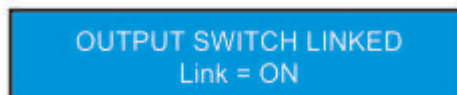
In this case, any time an Audio Preset is recalled by pressing one of the front panel's buttons, the equivalent Switch preset is also loaded: if the Audio Preset N. 1 is recalled, the Switch preset N. 1 is recalled too.

In a such case, each recalled preset is a combination of an Audio and a Switch preset.

To get the above result, need therefore to enter the System Setup's Output Switch Linked page



And to set as On the Link



If the Output Switch Linked is not active and the Switch presets aren't linked to the Audio ones, they'll not be recalled once pressed any one of the Preset Buttons.

Therefore, the Switch Outputs status can be "manually" defined by the User who will be allowed to recall "manually" one of the 10 Switch preset and leave it active until a new "Manual" setting or a change of the Output Switch Linked Status.



---

If the Output Switch Linked mode is set with Link = OFF, the User can "Manually" Load one of the 10 switch Presets available and previously created using the Pc Sw.  
This can be done from the Out Switch Setup Menu



System Setup  
----- Out Switch Setup -----

Within this Menu, the User can select and Load one of the 10 available Switch Presets.  
Pressing the Button 1 / Enter, the following sub-menu is entered:



OUTPUT SWITCH SETUP  
SP01

Here, the user can recall one of the 10 available Switch Presets SP01-SP10, just selecting the desired one by the Up/Down buttons.

As said, in this way any action on the Preset Buttons, forcing the Load of the corresponding Audio Preset, will not affect the status of the Output Switches, which will depend from the Preset loaded "Manually" by the User within the Output Switch Setup, being the Output Switch Linked Status set as OFF.

In order to finally leave and exit the System Setup mode, so to get back to normal working mode, is is enough to get back to any one of the 5 System Setup Menus and there from press the ESC button.

**NOTE:** The All Settings done within the System Setup Function will be effective ONLY WHEN LEFT the System Setup Mode itself.

Within the System Setup Mode, the all communications with the remote control units are DISABLED, so as the some "Real Time" processes available in the DMM 8008.

In Stand Alone Mode, the "Activity" of the DMM 8008 in terms of running processes and signal status, per each channel, can be checked thanks to the Vu-Metering features:

1 led for Microphone Phantom Power Supply Active

5 led for Outputs Activities:

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## 2.3 REMOTE CONTROL MODE

The DMM 8008 is mainly thought to operate with Remote Control Sw running on Pc.

Nevertheless, once created the desired presets for the defined applications, the unit can operate as a Stand Alone one, as seen before or as Wall Panel Remote Control working device.

The Remote control, when operated by the Wall Panel Remote control, is working on the base of the RS485 connector of the DMM 8008

The Pc Sw remote control, can instead operate with USB, RS485 or Tcp/Ip connection.

When used the USB connection, the Pc Sw Remote Control can control/edit ONLY one unit per time.

When used the RS485 or Tcp/Ip connection, the Pc Sw Remote Control can control/edit MORE units at the same time, connected each others in net.

Particularly, with the Tcp/Ip connection and using an external standard router, the DMM 8008 can even be controlled through a complete iPad remote control Sw.

A particular way of "double" Remote Control is allowed, being possible to connect to the Rs485 the Wall Panel Control and at the same time the Pc Sw Remote Control can be used if connecting the Pc on the USB connection.

### 2.3.1 REMOTE CONTROL VIA WALL PANEL



The wall mount control panel WP 8008 (separately available as an option) allows users to operate the DMM 8008 by two configurable modes: Zone Controller (only a single zone can be managed) and Global Controller (can be managed all inputs and outputs).

WP 8008 set as Zone Controller allow to:

- Adjust local output gain
- Set local mute
- Inputs selection
- Select lock condition
- View system info

WP 8008 set as Global Controller allow to:

- Adjust every inputs/outputs gain
- Set every inputs/outputs mute
- Recall presets stored
- Select lock condition
- View system info

### 2.3.2 REMOTE CONTROL VIA PC SOFTWARE

The computer software supplied can be used to operate the DMM 8008 by remote control. Thus, the unit may also be configured for operation without a computer. The configurations created may be saved on the unit or on the computer.

#### 2.3.2.1 INSTALLING PC SOFTWARE

The installation of the control program supplied requires a PC equipped with the *WINDOWS XP* operating system (*SP2*) or later, a memory of at least 512MB, 10MB free hard-disk space and a USB, Ethernet or RS485 interface. The screen resolution should be at least 1024x768 pixel.

To install the PC software, start the installation program "SETUP.EXE" on the CD supplied and follow the instructions of the installation program.

The connection via the USB interface or the Ethernet interface requires a special driver which is included on the CD supplied. Call up the file USB[...]*SETUP.EXE* to install the driver automatically. The driver will simulate a serial interface for the operating software.

#### 2.3.2.2 STARTING PC SOFTWARE

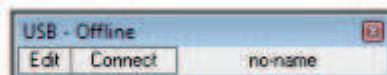
Start the control program DMM 8008 Vx.x.x on the PC. The main window (fig.1) appears, showing the units that were most recently connected. For each unit, a separate window is provided: the header shows information with regard to the interface as well as the connection status.



Fig.1

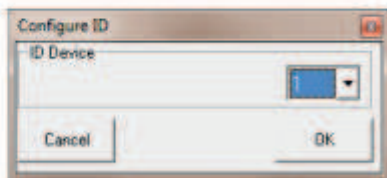
To add a(nother) unit, click the button "Add Device".

If USB is selected as the current interface type (the text on the button on the upper left is "USBCOMx"), the following unit window will be displayed:



After that, it is not possible to add further units.

If RS485 is selected as the current interface type ( the text on the button on the upper left is "RS485-COMx", the following dialog window will initially be displayed:



Select the unit number (ID) of the unit desired and then press "OK" to confirm.

If Ethernet is selected as the current interface type (the text on the button on the upper left is "TCP/IP"), the following dialog window will initially be displayed:



Enter the IP address of the unit desired and then press "OK" to confirm. For each unit, a separate window is added.



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### 2.3.2.3 CONNECTING - DISCONNECTING OR REMOVING UNITS

To establish a data connection to the unit, click the button "Connect" in the window of the unit desired. Instead of the unit name or "no-name" (if no name was assigned to the unit), a status bar is shown indicating the progress of the connection establishment. Once the connection has been established, the button "Connect" is replaced by the button "Disconnect". To connect all units, use the button "Connect All" located in the upper button bar of the main window. If a connection establishment fails and an error message is displayed (e.g. "COM not found", "Devices disconnected" or "IP address: x.x.x.x. not found"), this may be due to the following reasons:

- a wrong unit number / IP address has been set
- a cable connection is defective
- a unit is not switched on or its system menu is called up
- the wrong interface has been selected in the system menu
- the network settings on the computer are not correct (for connection via Ethernet)

The display of a connected unit shows the following (example):

*System Lock*

*PC Connection*

*or*

*System Lock*

*Online Device ID[01]*

*or if controlled via Ethernet*

*System Lock*

*IP: 192.168.001.101*

The unit cannot be directly operated as long as the connection exists.

To **disconnect** the data connection, click the button "Disconnect" in the window of the unit desired and then confirm the confirmation message. Then, the DMM 8008 can directly be operated again.

It is not possible to disconnect the connection while the configuration window of a unit is still open.

To **remove** a unit from the constellation, close the corresponding unit window (□) and then confirm the confirmation message. To remove all units, click the button "Remove Device" located in the upper button bar of the main window. Then confirm the confirmation message.

---

#### 2.3.2.4 NAMING - SAVING AND LOADING UNITS

The units may be named for easier identification in the main window. The default name is "no name". To change a unit name, double-click the current name. A dialog window appears. Overwrite the old name with the new name (max. 16 characters) and then click "OK" to confirm your changes or "Cancel" to cancel.

The units network currently created in the main window along with the unit names and the interface type may be saved as a "project" on the computer.

- Click the button "Save Project". The dialog window "Save As" is displayed.
- Enter the file name desired, select the location where the file is to be saved and then save the file.

By default, the subfolder "Project" is selected which was automatically created during program installation. The file extension \*.p88 is automatically appended to the file name entered.

To load a units network that has been saved on the computer:

- click the button "Load Project" located on the upper right of the window. The dialog window "Open" is displayed.
- select the file desired and then confirm your selection.

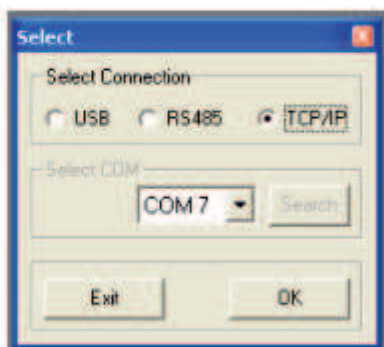
If the interface used by the constellation selected is different from the interface currently set, a warning message will appear. To go to the interface of the constellation, confirm the message.

#### 2.3.2.5 CHANGING INTERFACE

To change to one of the other interface types supported, first remove all units from the main window then:

- click the button on the upper left. Depending on the interface currently selected, the text on the button is "USB-COMx", "RS485-COMx" or "TCP/IP".

The following dialog window is displayed:



- Under "Select Connection" select the interface desired ("USB", "RS485" or "TCP/IP").
- For "RS485" the number of the port used for this interface must be selected under "Select COM". For "USB" the serial interface that simulates the driver for this software must be selected under "Select COM". Check the settings of the operating system for the appropriate COM interface or use the button "Search" to have it determined automatically.

The respective settings of the operating system can for example be found under: *\_ Control Panel\_System Properties (Hardware)\_Device Manager\_Ports (COM and LPT)*.

If there are conflicts with other units, the number of the COM interface may be changed here (e.g. *via\_Properties\_Port Settings\_Advanced...*).

**Note:** To avoid communication problems, it is recommended to manually change the COM numbers 10 and higher that are automatically assigned by the computer to the COM numbers 1 to 9.



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### 2.3.2.6 SETTING ID NUMBER OR IP ADDRESS

To operate multiple routers DMM 8008 by remote control via RS-485 or TCP/ IP, a separate ID number or IP address must be assigned to each unit prior to their first simultaneous operation. This may be done in the system menu or, as described in the following, via the computer:

Connect the units one after another to the PC, using the USB interface, and make the following settings for each unit:

- If the USB interface is not being selected, use the main window to go to the USB interface
- Add a unit (button "Add device")
- Connect the unit (button "Connect")
- For remote control via RS-485, press "Add Device" and select an ID number (1 – 64) under "Configure ID".
- For remote control via Ethernet, press "Add Device" define an IP address under "Configure ID".  
A network mask will automatically be generated

### 2.3.3 REMOTE CONTROL VIA iPad

The **DMM8008xT** App has been designed for the remote control by iPad of the DMM 8008.

The application could be free downloaded from the Apple Store and it offers the same control features ( with different graphic interface ) available on PC software.

One launched , the application will start scanning the network in order to detect the presence of DMM 8008. If no units will be detected, then the iPad will ask if to continue in OFFLINE MODE or close. In OFF LINE MODE, the all functions of the DMM 8008 can be seen and checked in their full functionality and parameters' range.

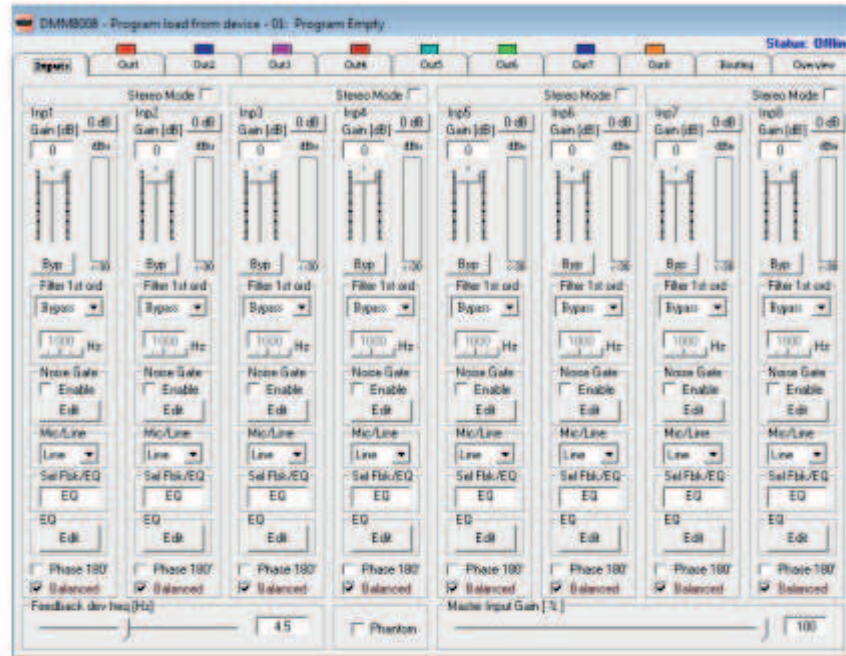
If a DMM 8008 is instead active and detected in the scanned network, then their assigned Name, IP Address, will be shown in the screen and make available to the user for the connection.

Until the user will not decide to connect the detected units, their presence will be noticed, but no editing action can be taken on them. From this Window, any time can be asked a new scanning (Scan Devices) in order to ask the detection of new units connected to the network, or to identify the removal of one or more of them. Once decided on which ones of the available units on the network to operate, editing their parameters, need to connect them to the iPad pressing the "Connect" buttons: the units now are connected and their connection will be stated on the Status Column. In order to work on the connected units, it is enough to press the related "Open" buttons and the editing windows will be available and accessible selecting the related icon on the bottom of the screen, aside the "Home" icon, ever representing the Main Scanning Window.



### 3. EDITING

#### 3.1 INPUTS PAGE

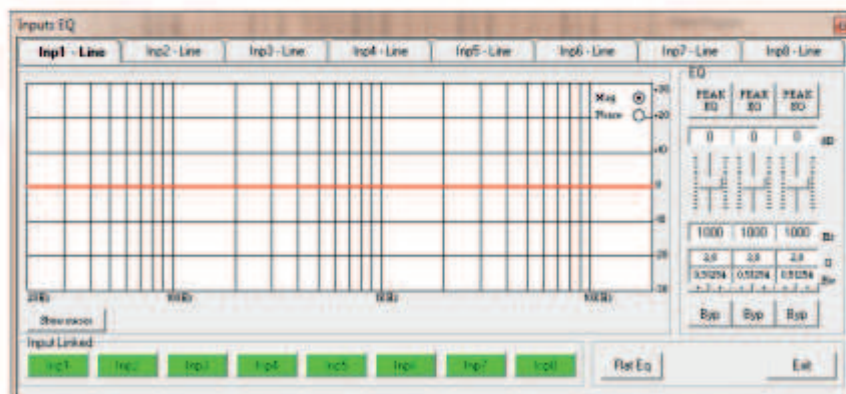


From the "Input" Page of the editing environment, on each input can be selected the source. This can be Microphone or Line.

When the **Line Source** is selected, the Input Gain can be adjusted from -127dB up to +12dB. A Bypass button is available for any channel, allowing to "Bypass" the channel's level setting and bringing it to 0dB.

A Master input Gain can be used to Mute the all Inputs (0%) or to bring all of them to a level up to 0dB (100%): each time the Gain Slider is halved in percentage, the Level of each Input is decreased of -6dB. For each input, is possible to set the signal Phase as "Direct" (unchecked box) or 180Deg. Reversed (box checked).

A 3 bands Equalizer is ever available and can be set pressing the "Edit" button. In a such case, the following Eq editing window will open



**EQ:** from this sub-frame it is possible to set the Input Channels three available Peaker (Bell) or variable Q Shelving Filters.

The DMM 8008 allows the user to select either Bell or variable Q Shelving Parameters and assign them independently using the 3 available filters.

The selection can be done just pressing the "Peak Eq" button on top of the filters' gain sliders and selecting one of the 3 available filters' type: Peaker, variable Q high Shelving and variable Q low Shelving.

**BELL Filter:** here Center Frequency, Band Width (Q) and Gain can be adjusted.

"**Center Frequency**": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

"**Bandwidth BW**": the selectable BW range is from 0.0312 Octave (Q=10) up to 3.59 Octave (Q=0.4) in steps of 0.1 Q.

"**Gain**": the selectable Gain range is from -12dB to +12dB in steps of 0.5 dB.

**Variable Q Low Shelving Filter:** here Center Frequency, Band Width (Q) (Slope) and Gain can be adjusted.

"**Center Frequency**": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

"**Bandwidth BW (Slope)**": the selectable BW range is from 0.0312 Octave (Q=10) up to 3.59 Octave (Q=0.4) in steps of 0.1 Q.

"**Gain**": the selectable Gain range is from -12dB to +12dB in steps of 0.5 dB.

**Variable Q High Shelving Filter:** here Center Frequency, Band Width (Q) (Slope) and Gain can be adjusted.

"**Center Frequency**": the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

"**Bandwidth BW (Slope)**": the selectable BW range is from 0.0312 Octave (Q=10) up to 3.59 Octave (Q=0.4) in steps of 0.1 Q.

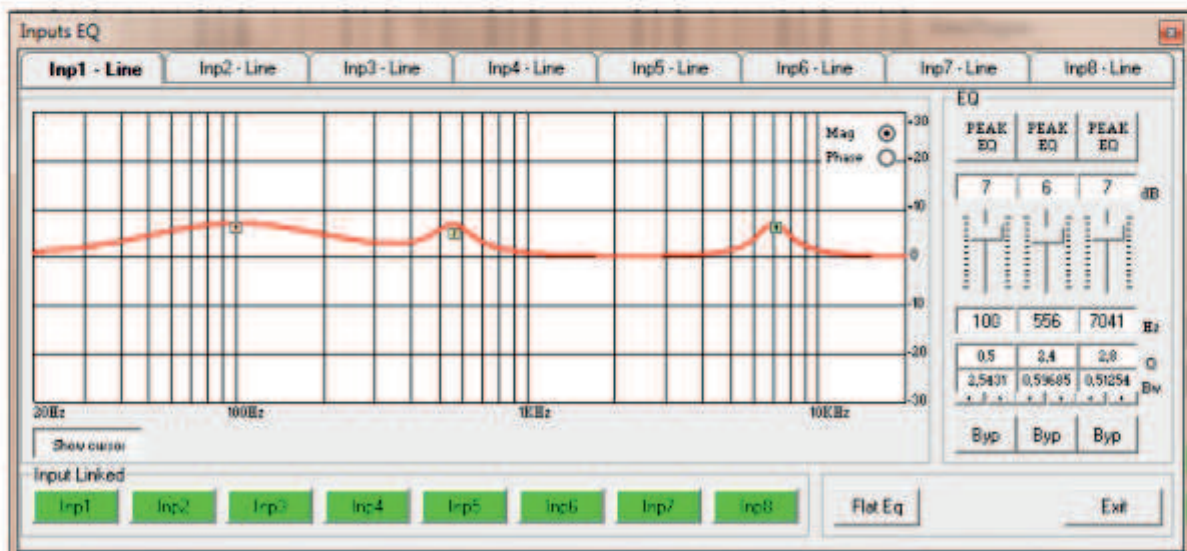
"**Gain**": the selectable Gain range is from -12dB to +12dB in steps of 0.5 dB.

**Note:** each single filter can be independently "bypassed" for an easy setting/use of them.

To "Bypass" the single filter, just press the "Bypass" button below the filter's parameters.

In order to set, if necessary, more Eq of the 8 input channels in the same way, "Input Linked" buttons are available and, when pressed, force the all channels corresponding to the pressed buttons to set the Eq in the same as as the one set for the currently edited channel (which has to be one of the linked ones)

The set up of the filters and specially their frequency placement can also be done with the use of the mouse, just activating the "Show Cursor" function, pressing the related button on the left bottom of the frequency response Graphic.



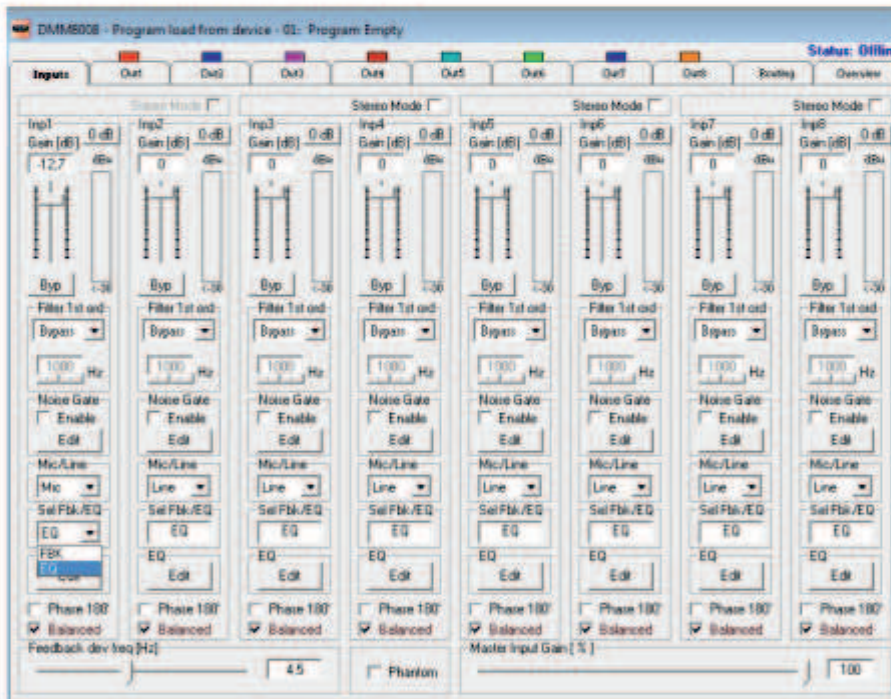


Once the all 3 available cursor are shown on the Frequency Response graphic, just selecting anyone of them with the mouse's arrow and maintaining the mouse's click pressed, it is possible to move and place the selected cursor on the desired frequency and with the desired gain.  
 For setting the filter's Q, still need to enter the desired value directly in the dedicated box in the filters' editing main sub-frame.

In order to see what's the "Phase" response of the channel once set up the all filters of the EQ, it is possible, selecting the Phase choice on the top right of the Graphic window, to turn the graphic in "Phase Response Graphic":



When the **Microphone** Source is selected, on the related channel is possible to adjust the Input level from -127dB up to 12dB.



When selected microphone as input, the user can chose to select on the input itself a 3bands Eq process on the Input signal, or a Feedback Eliminator.  
 When the 3 bands Eq is selected, the Equalizer can be edited in the same way shown for the Line Input case.



When the Feedback Eliminator is selected, it can be activated or not, and when active, its deviation can be set. The Feedback Eliminator is working on the base of a frequency shift process avoiding the feedback to raise up. The speed of the feedback elimination process it is just defining the amount of frequency shift is added to the input signal.

Independently from the Input selected (microphone or line), on the Inputs are ever available a first order Low Pass filter and a Noise Gate.

**First Order Low Pass Filter:** this filter is a first order Low Pas, with a 3dB/Oct Slope.

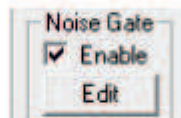
The filter's cut of frequency is ranging from 20kHz up to 1kHz by steps of 1/3 of Octave.

The filter can be made active or not (bypassed), checking or unchecking the "Enable" check box:



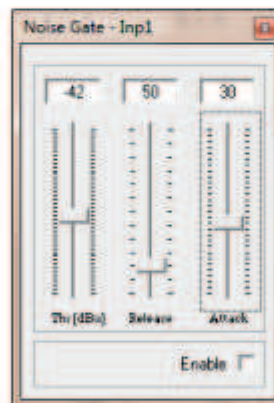
Once active, the smooth first order LP filter is intended to be mainly used with the microphone's input selected, in order to reduce the amount of high frequencies without affecting significantly the voice quality, nevertheless increasing the immunity to the Feedback.

**Noise Gate:** the particular DMM 8008 Noise Gate can be selected or bypassed checking or unchecking the "Enable" check box:



This Noise Gate has been thought as Noise Gate for the Line inputs, but also as Auto Switch On/Off when operating with the microphone inputs.

From this point of view, the range of a standard Noise gate have been extended, and particularly the one of the Gating Threshold, so to better fit the characteristics of the voice signal



**Gating Threshold:** the gating threshold is ranging from -80dB up to 0dBu.

This threshold is allowing to set a gating level for the microphones, pretty high, allowing in this way to open or close at level far from the common noise floor, so to open or close when a hi level signal, as the voice, is detected at the microphone's input or not.

**Attack Time:** it is ranging from 1ms up to 1 second and represent the speed of the Noise Gate in "closing" the input level once a signal in input is detected to be below the Gating Threshold.

**Release Time:** it is ranging from 10ms up to 1 second and represent the speed of the Noise Gate in "opening" the input level once a signal in input is detected to be above the Gating Threshold.

A **Phantom** power supply can be activated if microphones using a such power supply are chosen.

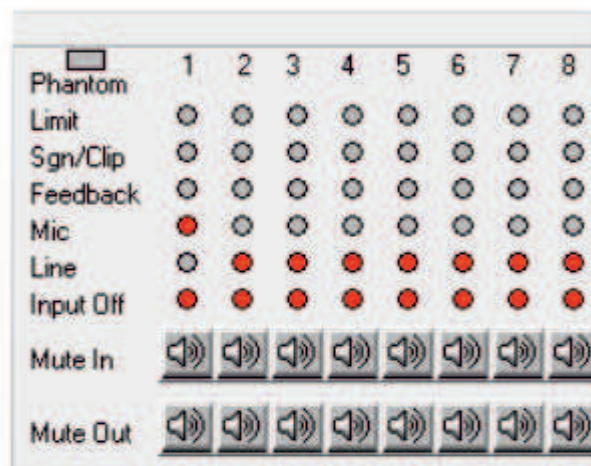
*Note:* at the bottom of the Meter Bar aside the level slider, both when Line or Microphone Input are selected, there is an indicator indicating in real time and precisely what's the current Input signal level in dBu

*Note1:* a "Balance" check box is also available.

When a Balanced Input is used, it has to be checked, so to get the proper input level adjustment.

If a Not Balanced Input is used, the box has to be left unchecked and the input level is automatically adjusted at +6dBu.

*Note2:* In order to help tuning properly the Noise Gate when used as Microphone Input On/Off Switch, 8 Leds indicating the Inputs status is available in the Led meters interface:



The line of "Input Off" leds is indicating when an Input is Off or Muted by the Noise Gate.

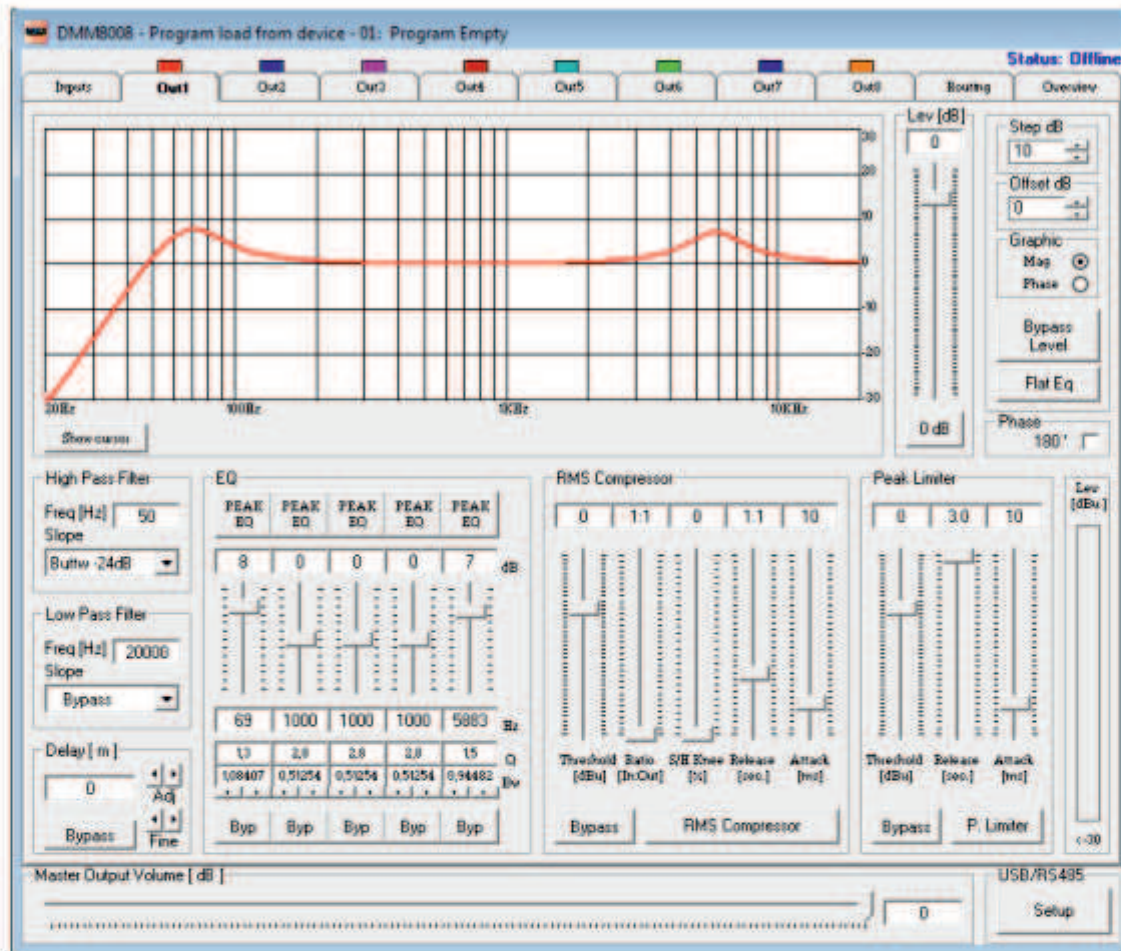
In that case the related Led is turned RED.

Once set the microphone inputs configurations, if used the Noise Gate as microphone On/Off Switch, the Noise Gate parameters and mainly the Gating Threshold can be tuned checking when the corresponding Input will be muted without any direct source in input but the noise floor.



## 3.2 OUTPUTS PAGE

From this windows is possible to access and edit the most significant signal processes of the 8 output channels.



**High Pass Filter:** from this sub-frame it is possible to set the Output Channels High Pass Filter (HPF).

**"Frequency":** (Low Cut frequency) the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

**"Slope":** allows you to select the X-Over's High Pass Filter Shape and Order.

The available shapes and orders for the High Pass Filter are listed below:

- Bypass (High Pass Filter Bypassed)
- Buttw 6dB (Butterworth Filter 6dB/Oct Slope)
- Buttw 12dB (Butterworth Filter 12dB/Oct Slope)
- LRiley 12dB (Linkwitz/Riley Filter 12dB/Oct Slope)
- Bessel 12dB (Bessel Filter 12dB/Oct Slope)
- Buttw 18dB (Butterworth Filter 18dB/Oct Slope)
- Buttw 24dB (Butterworth Filter 24dB/Oct Slope)
- LRiley 24dB (Linkwitz/Riley Filter 24dB/Oct Slope)
- Bessel 24dB (Bessel Filter 24dB/Oct Slope)



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**Low Pass Filter:** from this sub-frame it is possible to set the Output Channels Low Pass Filter (LPF).

**"Frequency":** (High Cut frequency) the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

**"Slope":** allows you to select the X-Over's Low Pass Filter Shape and Order.

The available shapes and orders for the Low Pass Filter are listed below:

- Bypass (High Pass Filter Bypassed)
- Buttw 6dB (Butterworth Filter 6dB/Oct Slope)
- Buttw 12dB (Butterworth Filter 12dB/Oct Slope)
- LRiley 12dB (Linkwitz/Riley Filter 12dB/Oct Slope)
- Bessel 12dB (Bessel Filter 12dB/Oct Slope)
- Buttw 18dB (Butterworth Filter 18dB/Oct Slope)
- Buttw 24dB (Butterworth Filter 24dB/Oct Slope)
- LRiley 24dB (Linkwitz/Riley Filter 24dB/Oct Slope)
- Bessel 24dB (Bessel Filter 24dB/Oct Slope)

**EQ:** from this sub-frame it is possible to set the Output Channels five available Peaker (Bell) or variable Q Shelving Filters.

The DMM 8008 allows the user to select either Bell or variable Q Shelving Parameters and assign them independently using the 5 available filters.

The selection can be done just pressing the "Peak Eq" button on top of the filters' gain sliders and selecting one of the 3 available filters' type: Peaker, variable Q high Shelving and variable Q low Shelving.

**BELL Filter:** here Center Frequency, Band Width (Q) and Gain can be adjusted.

**"Center Frequency":** the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

**"Bandwidth BW":** the selectable BW range is from 0.0312 Octave (Q=10) up to 3.59 Octave (Q=0.4) in steps of 0.1 Q.

**"Gain":** the selectable Gain range is from -12dB to +12dB in steps of 0.5 dB.

**Variable Q Low Shelving Filter:** here Center Frequency, Band Width (Q) (Slope) and Gain can be adjusted.

**"Center Frequency":** the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

**"Bandwidth BW (Slope)":** the selectable BW range is from 0.0312 Octave (Q=10) up to 3.59 Octave (Q=0.4) in steps of 0.1 Q.

**"Gain":** the selectable Gain range is from -12dB to +12dB in steps of 0.5 dB.

**Variable Q High Shelving Filter:** here Center Frequency, Band Width (Q) (Slope) and Gain can be adjusted.

**"Center Frequency":** the selectable frequencies range is from 20Hz to 20kHz in steps of 1/24 of an Octave.

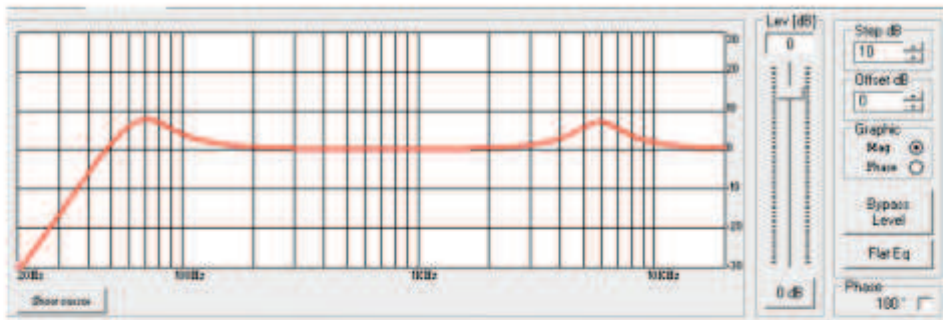
**"Bandwidth BW (Slope)":** the selectable BW range is from 0.0312 Octave (Q=10) up to 3.59 Octave (Q=0.4) in steps of 0.1 Q.

**"Gain":** the selectable Gain range is from -12dB to +12dB in steps of 0.5 dB.

**Note:** each single filter can be independently "bypassed" for an easy setting/use of them.

To "Bypass" the single filter, just press the "Bypass" button below the filter's parameters.

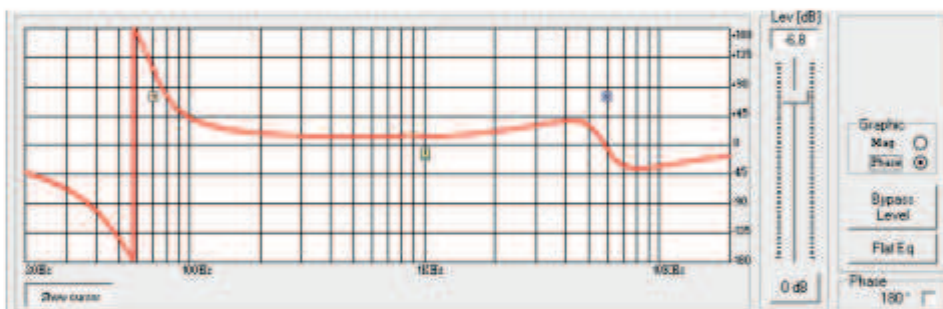
The set up of the filters and specially their frequency placement can also be done with the use of the mouse, just activating the "Show Cursor" function, pressing the related button on the left bottom of the frequency response Graphic.



Once the all 5 available cursor are shown on the Frequency Response graphic, just selecting anyone of them with the mouse's arrow and maintaining the mouse's click pressed, it is possible to move and place the selected cursor on the desired frequency and with the desired gain.

For setting the filter's Q, still need to enter the desired value directly in the dedicated box in the filters' editing main sub-frame.

In order to see what's the "Phase" response of the channel once set up the all filters of the EQ, it is possible, selecting the Phase choice on the top right of the Graphic window, to turn the graphic in "Phase Response Graphic":



**Step dB** – this simple function is allowing to set the resolution in dB of the Grid Lines of the Graphic displaying the Magnitude response of the equalization.

The resolution can be set in a range from 5dB up to 50dB, by steps of 5dB.

**Offset dB** – here can be set an "offset" in dB in visualizing the Magnitude response of the equalization.

Once added a positive offset, more space is given in the graphic to the visualization above the 0dB, when a negative offset is added, more space is given to the visualization below the 0dB.

The offset can be set in a range from 10dB up to -120dB, by steps of 10dB.

**Level [dB]** – from this sub-frame it is possible to set the Output Channels Level from -127dB up to +18dB.

Pressing the "Bypass" button at the bottom of the Level slider, the currently set level will be skipped and the output level will be set to 0dB.

**Phase** – when this check box is "unchecked" the processed signal is left with its original phase.

When the check box is "checked", then the original phase of the signal is inverted of 180Deg.

**Delay** – from this sub-frame it is possible to set the Output Channels Delay Time from 000.0000mS (0 meters) up to 380.998mS (129.53932 Meters), by steps of 1mS (Adj arrows) or 20.8uS (Fine arrows).



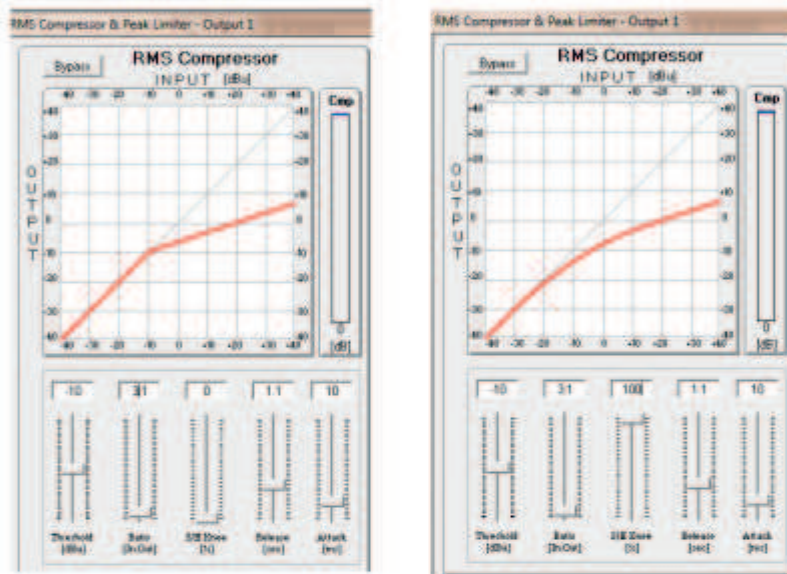
On each Output channel is available a powerful RMS compressor for improving the sound quality, followed by a Peak limiter useful for limiting the output signal before to enter the amplification system.

Each, RMS Compressor and Peak Limiter, can be independently set.

The editable parameters can be accessed directly from the RMS Compressor and Peak Limiter subframes, or entering a dedicated window accessible from both the sub-frames pressing the buttons "RMS Compressor" or "P. Limiter".

Both RMS Compressor and Peak limiter can be quickly skipped and re-activated by pressing the "Bypass" button within the respective sub-frames.

**RMS Compressor** – from this sub-frame it is possible to set the Threshold, Ratio, Attack Time, Release Time and "Knee" type of the Output Channels' RMS Compressor.



**"Threshold"**: the selectable range of the RMS Compressor's Threshold is from +14,2dBu (OFF) to -33,8dBu in steps of 0.2dBu

**"Ratio"**: the selectable range of the RMS Compressor's Ratio is from 1:1 (Off) up to 32:1 (Lim) in steps of 1.

**"Hard/Soft Knee"**: the selectable range of the RMS Compressor's Knee type is from 000% (Hard) up to 100% (Soft).

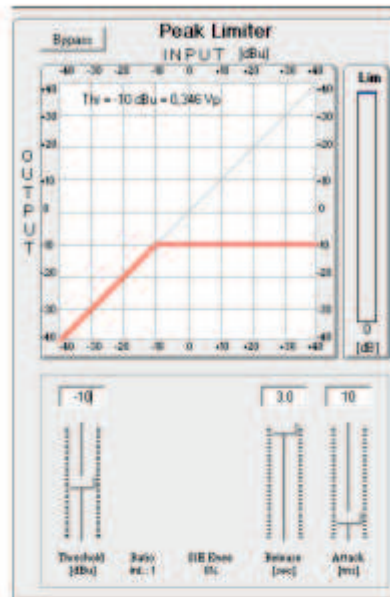
**"Release Time"**: the selectable range of the RMS Compressor's Release Time is from 0.1s to 3s in steps of 0.1s.

**"Attack Time"**: the selectable range of the RMS Compressor's Attack Time is from 5ms to 200ms in steps of 1ms - from 5ms to 20ms then 5ms - from 20ms to 30ms then 10ms - from 30ms to 100ms and 20ms - from 100ms to 200ms.

**Note**: The RMS Compressor Threshold is defined in dBu, due to the fact that with both, Sinusoid and Squared wave testing signals, the DMM 8008 compressed output dBu (RMS) Level is the same and matching the selected one.



**Peak Limiter** – from this sub-frame it is possible to set the Threshold, Attack Time and Release Time of the Output Channels' Peak Limiter.



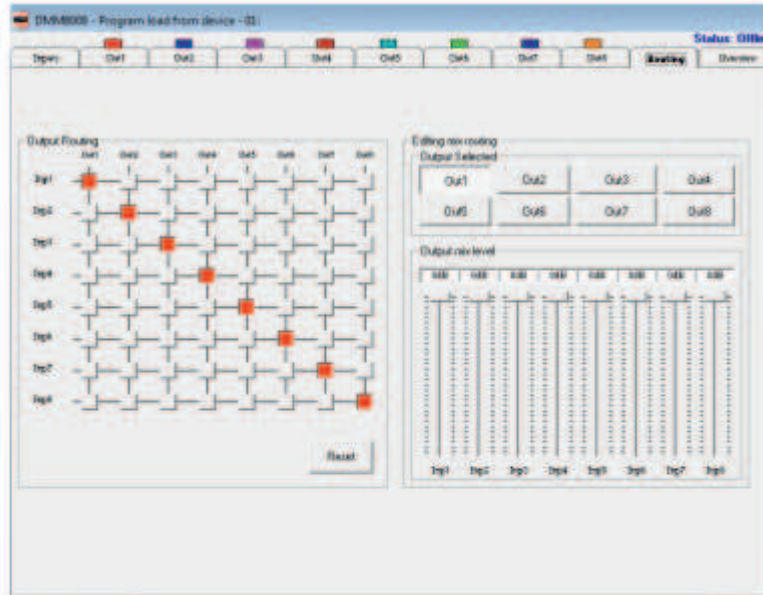
**"Threshold"**: the selectable range of the Peak Limiter's Threshold is from +14,2dB (Limiter not active) to -33,8dB in steps of 0.2 dB.

**"Release Time"**: the selectable range of the Peak Limiter's Release Time is from 0.1s to 3s in steps of 0.1s.

**"Attack Time"**: the selectable range of the Peak Limiter's Attack Time is from 5ms to 200ms in steps of 1ms - from 5ms to 20ms then 5ms - from 20ms to 30ms then 10ms - from 30ms to 100ms and 20ms - from 100ms to 200ms.

**Note**: The Peak limiter Threshold is defined in Vp, due to the fact that with both, Sinusoid and Squared wave testing signals, the DMM 8008 Peak Limited output Vp (Peak-Peak) Level is the same and matching the selected one.

### 3.3 ROUTING PAGE



The routing Page is allowing to set the Matrix Structure of the DMM 8008 and to assign to each Output the desired Inputs.

On the "Output Routing" Matrix block activating the desired "node" will connect the Input and the Output related to the Node.

On the "Editing mix routing", it is possible to adjust the Level of each input assigned to the Output selected by the related button.

So, selecting any one of the available 8 buttons, the related Output will be "formed" by the addition of the all inputs (assigned by the "Output Routing" Matrix Block, with the Level percentage defined by the "Output mix level" sliders.

The Levels of the "mixed inputs" to the selected outputs, can range from -30dB up to 0dB.

### 3.4 OVERVIEW PAGE



Within the Overview Page, can be checked the all channels inputs selection (between Microphone and Line), so as any of the available processes can be accessed double clicking on its name in the processes' block diagram. Particularly, in this page is also resumed the current selections operated for the Inputs in terms of available Eq or Feedback Eliminator processes, when Microphone Input is selected.

Here also can be selected the "Unit" for defining the amount of delay available on each output. The Delay can be actually set in "meters" or "milliseconds".

In the Overview Page are also accessible the Editing Pages of the **Automixer** and **Priority Ducker**. The DMM 8008 is running 2 Classic Automixer processes, the **NOM** (Number of Opened Microphones) and the **Gain Sharing**.

These 2 processes are used with microphones in Conference Systems for Voice quality improvement and Feedback effect reduction.

Has to be noticed here that the DMM 8008 can run together with the Classic NOM and Gain Sharing processes, also the First order Low Pass filter and mainly the Frequency shift Feedback Eliminator. This is providing a very strong Anti Feedback characteristic to the unit, which can let the NOM and Gain Sharing processes act mainly in terms of Voice quality and intelligibility improvement.

The Priority Ducker is a process able to assign to up to 4 microphone/line inputs, priority on the others, which will be attenuated in their input level as soon as a signal is detected on one of the input having the Priority. The Priority Ducker is mainly used in Conference System applications, there where is necessary to assign a priority to a microphone used by one Chairman or more equal priorities speakers. Nevertheless, the Priority Ducker can be very useful also in installation systems, there where a microphone or line input is used as Priority channel for priority or urgent announcements.



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### 3.5 AUTOMIXER FUNCTIONS

The DMM 8008 can perform 2 Classic processes of the Automixers, the NOM Attenuation and the Gain Sharing one.

**NOM Attenuation** : this is a process able to detect the number of microphones active (Opened) at the same time and, on the base of the Number of Opened Microphones, it is applying a predefined amount of attenuation to each microphone's input.

A simple formula determines the NOM Attenuation: "Attenuate by 3dB for every doubling of the Number of Open Microphones", which translates to the following:

$$\text{NOM Attenuation} = 10\log(\text{NOM})$$

Here are some examples to better illustrate the NOM attenuation:

- 1 active microphone means no attenuation:  $10\log(1) = 0\text{dB}$
- 2 active microphones translates to doubling the NOM:  $10\log(2) = 3\text{dB}$  of attenuation

Once the limit of 8 active microphones is reached (9dB attenuation), the NOM count and attenuation maximum is reached and will not increase further (hopefully the eight people trying to talk at once will have figured that out by then...).

Here following a table resuming the NOM Attenuation applied on the the base of the number of Opened Microphones:

NOM	Output Gain Adjustment (dB) $10\log(\text{NOM})$
1	0
2	-3.0
3	-4.8
4	-6.0
5	-7.0
10	-10.0
20	-13.0
100	-20.0

**Note:** The NOM attenuation could be free configurable.

**Gain Sharing:** This process is based on a dynamic control of the gain of each microphone channel; the gain of each channel is adjusted by comparing its level to the level of the sum of the level of the all microphones. The gain is computed so that the combined system gain of all microphones remains constant.

In this way, the microphones with the strongest signal are given the highest gain and those with low level signals have their gain reduced.

Specifically, each microphone channel is attenuated (turned down) by the amount, in dB, equal to the difference between that microphone channel's level and the sum of all microphone channel levels.

In example, if two talkers are each speaking on their own microphone channel at the same level, then the level of the sum of all channels would be 3 dB higher than the level from each of these mics (power addition).

Each microphone would then be turned down 3 dB.

If a person is being picked up equally by two microphones, the sum of these two signals would increase 6 dB. (The 6 dB increase results from the addition of two coherent signals.)

The level in each mic channel would be 6 dB lower than the sum and the gain of each mic is reduced 6 dB.

The resulting output would be the same as if only one mic were on. In a final example, a talker is speaking into his mic, but his voice also enters an adjacent microphone at a level 4 dB lower.

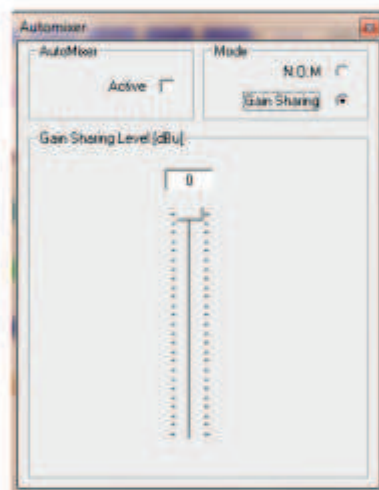
In a gated system, this second mic could very easily be gated "on" creating comb filtering effects.

In the gain sharing system, the gain of the second mic will be attenuated 4 dB.

This makes the level from the second mic 8 dB lower than the first, which will greatly reduce the interference.

**As said, the DMM 8008 can perform both processes.**

**The user can select which one to make active, entering the Automixer editing page and selecting the desired process, checking the related check box.**



If selected the Gain Sharing option, the Max Gain available to the SUM of the all microphones can even be set using the Gain Sharing level Slider.

When the Slider is set on 0dB, the MAX output available (virtually 0dB) is available to the SUM of the all microphones level.

If the slider is set at a different value, as in example -6dB, the Max gain allowed to the SUM of the all microphones level is -6dB.

This means that respect the case of the slider set to 0dB, the Gain of the microphones will start to be adjusted 6dB earlier when the slider is set to -6dB.



### 3.6 PRIORITY DUCKER

The Priority Ducker is a Side-Chain dynamic process, used to attenuate the level of a certain number of input channels on the base of a signal detected on an independent input.

In our case, the Priority Ducker Process is allowing to select from 1 to 4 Inputs as inputs having priority on the other ones.

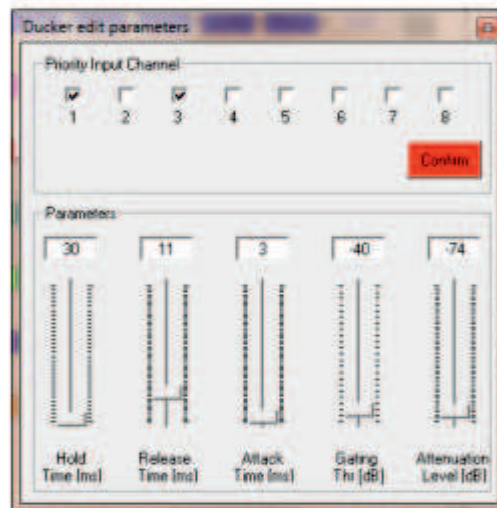
When signal above a defined threshold is detected on one of the Priority Inputs, the all others are attenuated of a defined amount of dB.

The Priority Ducker implemented on the DMM 8008 is allowing to assign to up to 4 of the all available Microphone/Line Inputs, Priority on the others.

Particularly, when a signal above the Gating threshold is detected on one of the Priority Inputs, the other inputs are attenuated of the Attenuation Level.

The Attenuation action is taken with the Attack Time speed and is maintained for the Hold time, after the signal on the Priority channels dropped below the Gating Threshold, before to go back to the original level in a time defined by the release time.

The all parameters of the DMM 8008 Ducker, can be set within the Ducker Edit Parameters window



Here can be defined the following

**Priority Input Channel:** up to 4 check boxes can be checked for choosing up to 4 channels which will have priority on the unchecked ones.

Once selected the Priority Channels, in order to make the Priority effective, need to confirm the selection pressing the "Confirm" button.

**Gating Threshold:** it is the threshold defining the limit has to be passed by the input signal level on the Priority channels to activate the ducking process and it is ranging from -44dB up to 0dB.

**Attenuation Level:** it is amount of attenuation applied to the channels not having priority when the Ducking process is active and is ranging from 0dB up to -80dB.

**Attack Time:** it is the speed needed by the Ducking process to reach the set Attenuation Level once the Ducking process is activated and is ranging from 1ms up to 2 seconds.

**Hold Time:** it is the time in between the de-activation of the Ducking process and the Release action and is ranging from 10ms up to 1 second

**Release Time:** it is the speed needed by the Ducking process to get back to the original gain level of the channels not having Priority, once the Ducking process is de-activated and is ranging from 1ms up to 2 seconds.

### 3.7 BACKGROUND UTILITIES



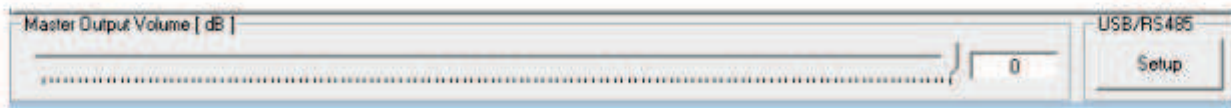
In this background screen, ever present together with the other editing pages, is displayed the channels' status.

Here are mainly reported the all activities of the DMM 8008 front panel's leds.

Each Input/Output channel can be muted so as input channels and output channels can be "linked" together so to report on the all linked channels the same parameters adjustments.

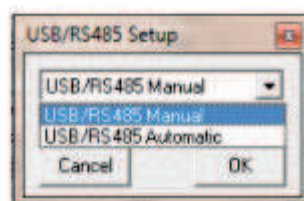
To link 2 or more channels, it is enough to press the related buttons within the "Input Linked" and "Output Linked" frames.

The Main output Level can also be adjusted from this Utilities window.



This is the same Level control used by the Wall Panel Remote Control.

Through the "Setup" button a selection window can be accessed allowing to set the DMM 8008 in Manual Mode, choosing the USB or RS485 interface, or in Automatic mode.





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From the Utilities Window, can be accessed also the all processes for Saving/Recalling presets to/from Pc and to/From the DMM 8008 and for configuring Special Processes activated by the External Switch Input Ports.

Particularly:

**Load:** allows to load on the Pc Remote Control a configuration previously saved on Pc

**Save:** allows to save on Pc the current editing session

**Store:** allows to store on the DMM 8008, in one of the 6 available location, the current editing session

**Read:** allows to read from the DMM 8008, one of the 6 stored presets and to display it on the current editing session

**Input Copy:** allows to copy the setting of one Input channel on an other one

**Output Copy:** allows to copy the setting of one Output channel on an other one

**Switch:** this particular button is allowing to enter e window where from up 4 lines (switches) can be set as 0 (boxes unchecked) or 5V (boxes checked).



The switches controlled by this window actually set as 0V or 5V the physical 4 output "switch" lines available on the DMM 8008 back panel and useful for controlling remote devices.

From this editing window, up to 10 different presets can be created, where a specific Switches configuration is assigned.

In order to create the presets, need first to press one of the 10 "Switch Preset" buttons

Once the specific button is presses, to that button will be assigned the current status of the 4 S1/S2/S3/S4 switches.

To any button, a different S(x) configuration can be assigned.

The different configuration will be maintained until the Pc Sw is open.

On the Pc can be saved ONLY a Configuration a time, the Pc will not store the configurations of the 10 buttons.

Therefore, on Pc will be saved any time the current configuration of the Switches S1/S2/S3/S4.

The several configurations can be then recalled and they'll be assigned to the currently pressed "Switch Preset" button.

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In example, creating the following configuration

S1 = checked  
S2 = unchecked  
S3 = unchecked  
S4 = unchecked

The configuration can be saved on Pc as "S1\_On".

If recalled, when the Switch Preset button ONE is pressed, then to the Switch Preset Button 1 will be associated the above configuration of the switches.

Different S(x) configurations can be saved with different names and be associated to different Switch Preset buttons.

Once assigned different S(x) configurations to different Switch Preset buttons, the user can recall the several configurations from Pc Sw just pressing the several Switch Preset buttons.

In order to store the 10 Preset configurations within the DMM 8008, so to be able to recall them by DMM 8008 front panel or together with the "Audio Presets" if active the "link" function (see later), it is enough to press any Switch Preset button in order to make it active and press the "Store to Device" button.

The preset related to the currently active Switch Preset button, will be stored in the equivalent preset location within the DMM 8008.

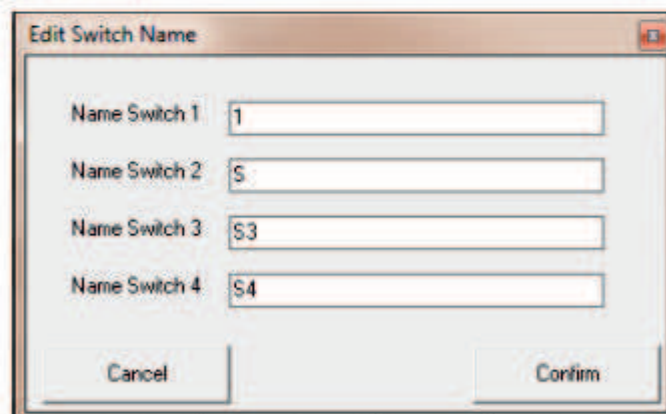
In order to store the all 10 presets, need to make active one by one the all Switch Preset buttons and for anyone of them press the "Store to Device" button.

Once stored within the DMM 8008, the 10 presets controlling the S(x) switches status can be recalled manually and independently from the "Audio" Presets, from the unit's front panel.

If the User want to recall the Switch Presets together with the Audio Presets, which would mean that together with the Audio preset number 1, the user want to be recalled also the Switch Preset number 1 (the Audio preset and Switch Preset numbers have to match...), then is necessary to LINK the Audio Presets and the Switch Presets.

This can be done checking the "Link Switch preset to Audio preset" check box within the Link Switch frame of the Switch Editing window.

To the Switches can also be assigned a NAME, just pressing the "Edit Switch Name" button and entering the Edit Switch Name window



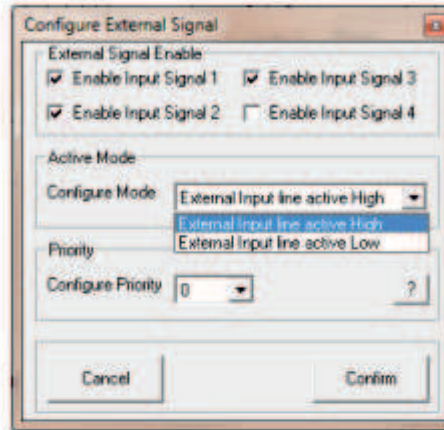
The image shows a dialog box titled "Edit Switch Name". It contains four rows of text labels followed by input fields:

- Name Switch 1: 1
- Name Switch 2: S
- Name Switch 3: S3
- Name Switch 4: S4

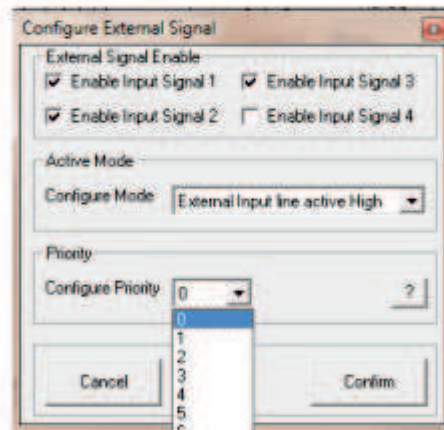
At the bottom of the dialog box, there are two buttons: "Cancel" on the left and "Confirm" on the right.



**Extra Program:** the External Program section is allowing the user to set as active or not active anyone of the 4 available Input Switches.  
When set as active one or more of them, it is also possible to define with the "Configure Mode" option, if the Input Switch signal has to be considered active on its High or Low level detected.



Furthermore, it is also possible, in case more Events related to the Input Switches are occurring at the same time, so activating at the same time more than one Switch, to assign a Priority in "serving" the events related to the active Switches (see below).



The desired Priority can be set selecting one of the 8 options available, corresponding to the following Priority Table (accessible pressing the "?" button aside the "Configure Priority" selection box):

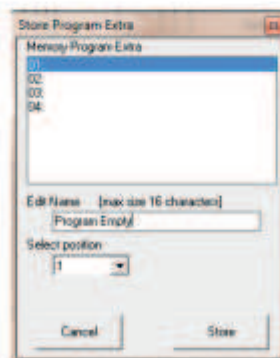
Priority	With mode = Signal Active High	With mode = Signal Active Low
0	recall program E4 if S4 = 1 or recall program E3 if S3 = 1 or recall program E2 if S2 = 1 or recall program E1 if S1 = 1	recall program E4 if S4 = 0 or recall program E3 if S3 = 0 or recall program E2 if S2 = 0 or recall program E1 if S1 = 0
1	recall program E3 if S3 = 1 or recall program E2 if S2 = 1 or recall program E1 if S1 = 1 or recall program E4 if S4 = 1	recall program E3 if S3 = 0 or recall program E2 if S2 = 0 or recall program E1 if S1 = 0 or recall program E4 if S4 = 0
2	recall program E2 if S2 = 1 or recall program E1 if S1 = 1 or recall program E4 if S4 = 1 or recall program E3 if S3 = 1	recall program E2 if S2 = 0 or recall program E1 if S1 = 0 or recall program E4 if S4 = 0 or recall program E3 if S3 = 0
3	recall program E1 if S1 = 1 or recall program E4 if S4 = 1 or recall program E3 if S3 = 1 or recall program E2 if S2 = 1	recall program E1 if S1 = 0 or recall program E4 if S4 = 0 or recall program E3 if S3 = 0 or recall program E2 if S2 = 0
4	recall program E1 if S1 = 1 or recall program E4 if S4 = 1 or recall program E3 if S3 = 1 or recall program E2 if S2 = 1	recall program E1 if S1 = 0 or recall program E4 if S4 = 0 or recall program E3 if S3 = 0 or recall program E2 if S2 = 0
5	recall program E2 if S2 = 1 or recall program E3 if S3 = 1 or recall program E4 if S4 = 1 or recall program E1 if S1 = 1	recall program E2 if S2 = 0 or recall program E3 if S3 = 0 or recall program E4 if S4 = 0 or recall program E1 if S1 = 0
6	recall program E3 if S3 = 1 or recall program E4 if S4 = 1 or recall program E1 if S1 = 1 or recall program E2 if S2 = 1	recall program E3 if S3 = 0 or recall program E4 if S4 = 0 or recall program E1 if S1 = 0 or recall program E2 if S2 = 0
7	recall program E4 if S4 = 1 or recall program E1 if S1 = 1 or recall program E2 if S2 = 1 or recall program E3 if S3 = 1	recall program E4 if S4 = 0 or recall program E1 if S1 = 0 or recall program E2 if S2 = 0 or recall program E3 if S3 = 0

S1 – S4 refer to the respective contacts of the Input Port terminal

Once operated the all desired selections, need to "Confirm" them before to exit the "Configure External Signal" Page.

To anyone of the 4 External Switches (Events) can be related a specific process. This process is corresponding to a Input/Output specific Configuration (Preset), that has to be recalled ONLY if the related Event (Switch Active) is occurring. So, 4 Extra Presets other than the 6 available for the normal operations, can be created and stored, so to be recalled ONLY when the related event is occurring.

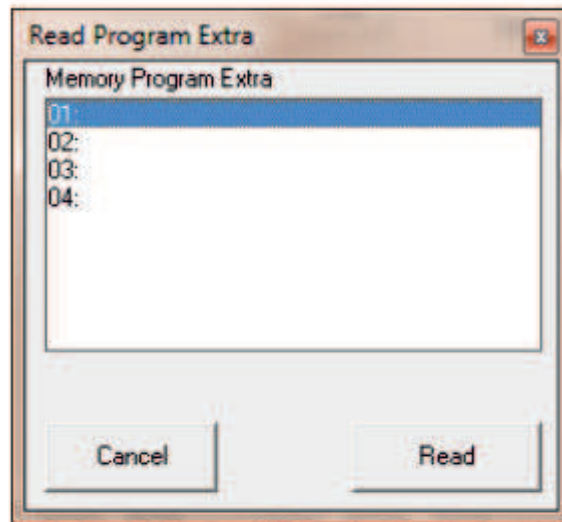
Once create the 4 Extra Presets, they can be stored within the DMM 8008 Through the Button "Store":





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The Extra Presets can be saved in 4 available locations where the location number is corresponding to the related Switch Input Event.  
To anyone of the 4 Extra Preset can be assigned a specific name.  
Once saved the Extra Presets, they can be anytime recalled for check using the "Read" button.



For Leaving the Remote control Sw, it is enough to click "Exit" on the "file" option on the top left corner of the Main Editing Environment.

Once left the Pc Sw Remote Control, the DMM 8008 will go back to the Stand Alone Mode and the LCD will display the currently running preset:



## 4. TECHNICAL SPECIFICATIONS

### Audio

Analog Input	8 electronically balanced ( Mic - Line - Unbalanced )
Analog Output	8 electronically balanced
Maximum Input Level	Line: +14dBu; Mic: -20/0dBu ( +6dBu unbalanced )
Mic Input Gain	35dB ( 23dB analog, 12dB digital )
Maximum Output Level	+14dBu
THD+N	0.005% at 1kHz 0dBu
S/N	>104dBA
Frequency Response	20Hz-20kHz +/-1dB
AD & DA Converters	4 x AK5385B 24bit, 1 x Ak4358 24bit (48kHz)
Phantom Power	48Vdc
Impedance	Line Mic Input 3300 Ohm / Outputs 115 Ohm

### DSP & Processing

DSP Engine	Dream SAM3716, 24bit (data) x 96bit (coeff.)
DSP Resolution	24 x 32 bit for filtering process; 96bits resolution on intermediate computation results
Input Equalization	3-band parametric selected as peaking or Low/High shelving with variable Q per input channel Low/High pass 1st order filter per input channel
Output Equalization	5-band parametric EQ selected as peaking or Low/High shelving with variable Q per output channel
Filter Gain	From -12dBu up to +12dBu by 0.5dBu resolution steps
Center Frequency	Selectable with a 1/24th of octave resolution step from 20Hz up to 20kHz
Filter Q/BW	Q from 0.4 up to 10 by 0.1 resolution steps
Crossover Section HPF/LPF	Butterworth 6/12/18/24dB per octave Bussel, Linkwitz-Riley and custom 12/24dB per octave Filter resolution 1/24th of octave
RMS Compressor and Peak Limiter	Threshold from 14dBu up to -34dBu Attack time from 5ms up to 200ms (1ms resolution up to 20ms, 10ms resolution up to 100ms and 20ms resolution up to 200ms) Release time from 0.1 sec up to 3 sec (0.1 sec resolution) Ratio from 1:1 to 32:1 (compressor only) Adjustable soft or hard knee (compressor only)
Delay	380,998 ms 21 us increment/decrement steps per output channel only
Feedback Eliminator	Pitch shifting algorithm only for Mic input channels
Automixing Functions	NOM attenuation, Gain sharing algorithm and priority ducking processing

### General

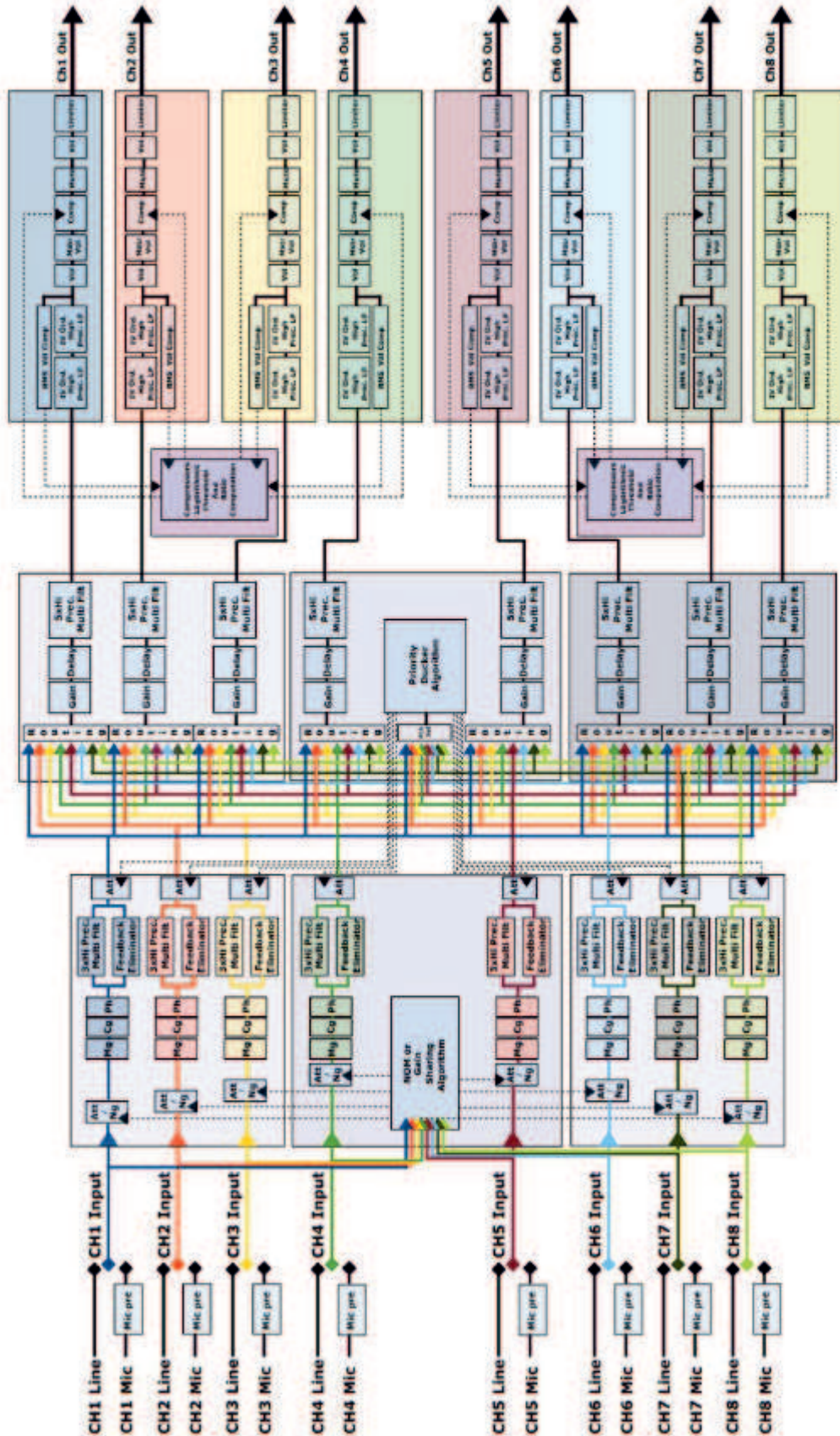
Device Presets	6 user presets + 4 by using S1-S4 digital input ports
Front Panel	2 x 24 character LCD display with white/blue LED backlight 6-LED status indicators (Line, Mic, Mute I/O, Signal, Clip, Limiter) 1-LED indicator Phantom power 6 x front push button (Preset recall, Setup)
Rear Panel	USB type B connector 2 x 12 pin Phoenix connector (Mic/Line inputs) 2 x 12 pin Phoenix connector (Line outputs) 2 x 4 pin Phoenix connector (S1-S4 digital input ports - TTL level 0-5V) 2 x 4 pin Phoenix connector (S1-S4 digital output ports - TTL level 0-5V) 2 x RJ45 for RS485 In/Out connection 1 x RJ45 with activity leds for Ethernet connection (10/100 TCP-IP) IEC C13 16A connector; power on/off switch
Optional Device	FBT WP8008 wall panel control
Included Software	PC users interface; Free app. for iPad®
Main AC	90-240Vac (50/60Hz) - 40W
Dimensions	19" x 1.75" x 9" ( 483 x 44 x 229mm ) - 1RU
Weight, Net/Shipping	7.71lbs (3.5kg) / 8.82lbs (4kg)

Specifications subject to change without notice.



## 5. BLOCK SCHEME

### DMM 8008 Pro Digital Matrix 8 in x 8 out with «Feedback Elim OR EQ, Auto mix and Priority Ducker»



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## 6. COMMUNICATION PROTOCOL

### U.A.R.T. SETTING

BAUD-RATE = 57600  
PARITY = NONE  
DATA BIT = 8  
BIT STOP = 1

### TCP/IP SETTING

REMOTE\_PORT = 1001  
IP ADDRESS = from 1. 0. 0. 1 to 223.255.255.254 with:  
- IP=1.0.0.2 to IP=126.255.255.254 automatically SUBNET MASK= 255. 0. 0. 0  
- IP=127.0.0.2 to IP=191.255.255.254 automatically SUBNET MASK= 255. 255. 0. 0  
- IP=192.0.0.2 to IP=223.255.255.254 automatically SUBNET MASK= 255. 255. 255. 0  
GATEWAY = IP(0). IP(1). IP(2). 1

### FRAME PROTOCOL

The REMOTE CONTROL must be send to the DEVICE the following frame:

TX:  
STX ID\_M ID\_N CMD D0 D1 D2 D3 D4 D5 D6 D7 ETX

Where:

STX = F0H Start message

ID\_M = 46H Id device

ID\_N = 0,..,64 Id number device (0 only for USB / TCP/IP connection; 1,..,64 for RS485)

CMD = xx Command type

DATA0,..,7= xx Data byte

ETX = F7H End message

When the DEVICE receive this frame it evaluate the command type and after the execution it resend to the REMOTE CONTROLL an acknowledge, This acknowledge is dependent on the command type



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## COMMAND TYPE

CONNECTION REQUEST 00H  
UPDATE GAINS-PHASE-MUTE 01H  
UPDATE ROUTING 08H  
CLOSE SINGLE DEVICE 0FH  
UPG\_MASTERGAIN\_CMD 16H  
SWITCH\_S\_CMD 1AH  
RECALL\_PRESET 1BH  
CMD\_UPG\_BALANCED 1FH  
INC\_DECR\_GAIN\_LINKED\_CMD 2FH  
INC\_DECR\_GAIN\_CMD 30H  
INC\_DECR\_MASTERGAIN\_CMD 31H  
INC\_DECR\_MASTERVOLUME\_CMD 32H  
MUTE\_UNMUTE\_CMD 33H  
UPG\_ONLY\_GAINS\_CMD 34H  
CHANGE\_PRESET\_SWITCH\_CMD 3DH  
LINK\_SWITCH\_CMD 3EH  
UPG\_AUTOMIX\_BYP\_CMD 61H  
UPG\_AUTOMIX\_MODE\_CMD 62H  
UPG\_AUTOMIX\_GS\_CMD 64H  
READ\_AUTOMIX\_NOM\_ATT\_CMD 0EH  
UPG\_DUCKER\_PRIORITY\_CMD 66H  
UPG\_DUCKER\_HOLD\_CMD 67H  
UPG\_DUCKER\_REL\_ATK\_CMD 68H  
UPG\_DUCKER\_THR\_CMD 69H  
VUMETER\_OUT\_CMD 36H  
VUMETER\_LIM\_CMD 37H  
VUMETER\_CMP\_CMD 38H  
READ\_VERSION\_CMD 39H  
CLOSE ALL DEVICES 8FH  
READ\_MAC\_ADDRESS\_CMD B2H  
VUMETER\_IN\_CMD 55H

## COMMUNICATION BETWEEN DEVICE AND REMOTE CONTROL

### READ\_VERSION\_CMD: CMD=39H

#### TX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	39H	00H	00H	00H	00H	00H	00H	00H	00H	F7H

#### RX:

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	39H	Sm0	Sm1	Sm2	St0	St1	St2	46H	Type	F7H

The SyncMos version is V1.0 so the user can read Sm0 = 0, Sm1 = 1, Sm2 = 0

The current STM8S version is V1.0.2 so the user can read ST0 = 1, ST1 = 0, ST2 = 2

**Type:** type of the device, **Type=1** then the device is DMM8008

**CONNECTION REQUEST: CMD=00H****(to lock the hardware interface when the PC is connected)****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	00H	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	00H	46H	00H	00H	00H	00H	00H	00H	00H	F7H

If the device is connect and the ID\_N is correct then the device resend the same frame but with the D0=46H and the hw interface is locked

**UPDATE GAINS-PHASE-MUTE: CMD=01H****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	01H	Chn	00H	00H	VolL	BypG	Mute	Phase	VolH	F7H

**Chn**=0,...,15: Channel selected, 0,..7=In1,..,In8; 8,...,15=Out1,..,Out8

if Chn=0,..,7 then Input channel

**BypG**= Input Bypass Gain = 8 bit where LSB=Input1,.., MSB=Input8; Value=0,1 where 0=not bypass, 1=bypass

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
input8	input7	input6	input5	input4	input3	input2	input1

**Mute**= Input Mute = 8 bit where LSB=Input1,.., MSB=Input8; Value=0,1 where 0=Unmute, 1=Mute

**Phase**= Input Phase = 8 bit where LSB=Input1,.., MSB=Input8; Value=0,1 where 0=direct, 1=invers

**VolH + VolL** = Value a 16Bit = 0,..,1390 (-127dB to +12dB step 0.1dB),

if Chn=8,..,15 then Output channel

**BypG**= Output Bypass Gain = 8 bit where LSB=Output1,.., MSB=Output8; Value=0,1 where 0=not bypass, 1=bypass

**Mute**= Output Mute = 8 bit where LSB=Output1,.., MSB=Output8; Value=0,1 where 0=Unmute, 1=Mute

**Phase**= Output Phase = 8 bit where LSB=Output1,.., MSB=Output8; Value=0,1 where 0=direct, 1=invers

**VolH+VolL**= Output Gains = 16bit from 0 to 1450 (-127dB to 18dB step 0.1dB)

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	01H	Chn	00H	00H	VolL	BypG	Mute	Phase	VolH	F7H

This is the acknowledge

**UPG\_ONLY\_GAINS\_CMD: CMD=34H**



**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	34H	Chn	00H	00H	VolL	00H	00H	00H	VolH	F7H

**Chn**=0,...,15: Channel selected, 0,..7=In1,..,In8; 8,...,15=Out1,..,Out8

if Chn=0,..,7 then Input channel

**VolH + VolL** = Value a 16Bit = 0,...,1390 (-127dB to +12dB step 0.1dB),

if Chn=8,..,15 then Output channel

**VolH+VolL**= Output Gains = 16bit from 0 to 1450 (-127dB to 18dB step 0.1dB)

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	34H	Chn	00H	00H	VolL	00H	00H	00H	VolH	F7H

This is the acknowledge

**UPDATE ROUTING: CMD=08H****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	08H	Chn	00H	00H	00H	00H	00H	Nin	Val	F7H

**Chn**=8,...,15: Channel selected =Out1,..,Out8;

**NIn** = 0,..,7 Select input to the Output channel selected 0=In1,..,7=In8

**Val** = 0,..,30 Input Gain from -30dB to 0dB step 1dB

if the cross InputX to OutputY is disable (mute) then **Val** = 80H + Val

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	08H	Chn	00H	00H	00H	00H	00H	Nin	Val	F7H

This is the acknowledge

**CLOSE SINGLE DEVICE: CMD=0FH  
(to unlock the hardware interface)****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	0FH	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	0FH	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**UPG\_MASTERGAINS\_CMD: CMD=16H****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	16H	CHN	00H	00H	00H	00H	00H	ValH	ValL	F7H

**CHN**=0,8: Channel selected, 0= Input, 8=Output**ValH+ValL**= MasterGains = 16bit from 0 to MaxIndex

If CHN = 0 then MaxIndex = 100 (0% to 100%)

If CHN = 8 then MaxIndex = 1270 (-127dB to 0dB step 0.1dB)

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	16H	CHN	00H	00H	00H	00H	00H	ValH	ValL	F7H

**This is the acknowledge****SWITCH\_S\_CMD: CMD=1AH****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	1AH	00H	00H	00H	00H	00H	00H	00H	Val	F7H

**Val**= 4 bit, Value of the switch set line output 0V or 5V LSB=Line1,...,LSB+3=Line4; Value=0,1 where 0=Line 0V, 1=Line 5V**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	1AH	00H	00H	00H	VolL	00H	00H	00H	Val	F7H

**This is the acknowledge****RECALL\_PRESET: CMD=1BH****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	1BH	Npr	00H	00H	00H	00H	00H	00H	00H	F7H

**Npr** = Recall number preset = 0,...,9**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	1BH	Val	00H	00H	00H	00H	00H	00H	00H	F7H

if preset selected is not empty the system load the new preset and return in D0 the value of the preset loaded

if preset selected is empty the system skip this command and return in D0 the value = FFH

**CMD\_UPG\_BALANCED: CMD=1FH****TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	1FH	Chn	00H	00H	00H	00H	00H	00H	Val	F7H

**Chn**=0,...,7: Channel selected, 0,..7=In1,..,In8;



**Val** = Select input Balanced/Unbalanced = 8 bit where LSB=Input1,..., MSB=Input8; Value=0,1 where 0=Unbalanced, 1=Balanced

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
input8	input7	input6	input5	input4	input3	input2	input1

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	43H	XX	1FH	Chn	00H	00H	00H	00H	00H	00H	Val	F7H

This is the acknowledge

**CHANGE\_PRESET\_SWITCH\_CMD: CMD=3DH**

**TX:**

STX	ID_M	ID_D	CMD	Data0	Data1	Data2	Data3	Data4	Data5	Data6	Data7	ETX
F0H	46H	XX	3DH	00H	00H	00H	00H	00H	00H	00H	Val	F7H

**Val** = 0,...,9 (preset1,...,preset10)

**RX:**

STX	ID_M	ID_D	CMD	Data0	Data1	Data2	Data3	Data4	Data5	Data6	Data7	ETX
F0H	46H	XX	3DH	00H	00H	00H	00H	00H	00H	00H	Val	F7H

**LINK\_SWITCH\_CMD: CMD=3EH**

**TX:**

STX	ID_M	ID_D	CMD	Data0	Data1	Data2	Data3	Data4	Data5	Data6	Data7	ETX
F0H	46H	XX	3EH	00H	00H	00H	00H	00H	00H	00H	Val	F7H

**Val** = 0,1 (0=Link OFF, 1=Link ON)

**RX:**

STX	ID_M	ID_D	CMD	Data0	Data1	Data2	Data3	Data4	Data5	Data6	Data7	ETX
F0H	46H	XX	3EH	00H	00H	00H	00H	00H	00H	00H	Val	F7H

**UPG\_AUTOMIX\_BYP\_CMD: CMD=61H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	61H	00H	00H	00H	00H	00H	00H	00H	Byp	F7H

**ùByp**= AutoMixerBypass, Value=0,1 where 0=bypass, 1=not byp

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	61H	00H	00H	00H	00H	00H	00H	00H	Byp	F7H

**UPG\_AUTOMIX\_MODE\_CMD: CMD=62H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	61H	00H	00H	00H	00H	00H	00H	00H	Byp	F7H

**Mode**= AutoMixerMode, Value=0,1 where 0=NOM (Number of Open Mic), 1=Gain Sharing

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	62H	00H	00H	00H	00H	00H	00H	00H	Mode	F7H

**UPG\_AUTOMIX\_GS\_CMD: CMD=64H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	64H	00H	00H	00H	00H	00H	LEV	00H	00H	F7H

**LEV**= AutoMixer\_GS\_Level, Value=0,..,24 (-12dB to 0dB step 0.5dB)

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	64H	00H	00H	00H	00H	00H	LEV	00H	00H	F7H

**UPG\_AUTOMIX\_NOM\_ATT\_CMD: CMD=6AH**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	6AH	Mic1	Mic2	Mic3	Mic4	Mic5	Mic6	Mic7	Mic8	F7H

**Define the attenuation of the MIC(s) when the user use 1,2,..,8 mic, valid only if the mode is N.O.M**

**Mic1,..,8**= value of the attenuation :0,..,200 (-20dB to 0dB step 0.1dB)

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	6AH	Mic1	Mic2	Mic3	Mic4	Mic5	Mic6	Mic7	Mic8	F7H

**READ\_AUTOMIX\_NOM\_ATT\_CMD: CMD=0EH**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	3EH	00H	00H	00H	00H	00H	00H	00H	Val	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	0EH	03H	D8H	08H	00H	00H	00H	00H	Byp	F7H

**Mic1,..,8**= value of the attenuation :0,..,200 (-20dB to 0dB step 0.1dB)

**UPG\_DUCKER\_PRIORITY\_CMD: CMD=66H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	66H	00H	00H	00H	00H	00H	00H	00H	Byp	F7H

**Byp**= Ducker priority = 8 bit where LSB=Input1,.., MSB=Input8; Value=0,1 where 0=bypass, 1=not byp (max number of the channel with priority is 4)

**RX:**



STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX	
F0H	46H	XX	66H	00H	00H	00H	00H	00H	00H	00H	00H	ByP	F7H

This is the acknowledge

**UPG\_DUCKER\_HOLD\_CMD: CMD=67H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX	
F0H	46H	XX	67H	00H	00H	00H	00H	00H	00H	00H	00H	Hold	F7H

**Hold** = Ducker Hold Time Value=0,..,99 (da 10ms a 1000ms)

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX	
F0H	46H	XX	67H	00H	00H	00H	00H	00H	00H	00H	00H	Hold	F7H

This is the acknowledge

**UPG\_DUCKER\_REL\_ATK\_CMD: CMD=68H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX	
F0H	46H	XX	68H	00H	00H	00H	00H	00H	00H	00H	Rel	Atk	F7H

**Rel** = Ducker Release Time Value=0,..,47

**Atk** = Ducker Attack Time Value=0,..,47

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX	
F0H	46H	XX	68H	00H	00H	00H	00H	00H	00H	00H	Rel	Atk	F7H

**UPG\_DUCKER\_THR\_CMD: CMD=69H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	69H	00H	00H	00H	00H	00H	Att	Gate	00H	F7H

**Att** = Ducker Attenuation level Value=0,..,80

**Gate** = Ducker gating thr Value=0,..,44

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	69H	00H	00H	00H	00H	00H	Att	Gate	00H	F7H

This is the acknowledge

**VUMETER\_LIM\_CMD: CMD=37H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	37H	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	37H	In1	In2	In3	In4	In5	In6	In7	In8	F7H

In1,...,I8 are the value already in dB of the Limiter activity(for each output)  
 $dB = 60 - (InX / 2)$  (max limitazione = 48dB poiche' limiter Thr = -30 to +18 ) (inX = 0,...,120; step dB = 0.5)

**VUMETER\_CMP\_CMD: CMD=38H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	38H	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	38H	In1	In2	In3	In4	In5	In6	In7	In8	F7H

In1,...,I8 are the value already in dB of the Compression activity (for each output)  
 $dB = 60 - (InX / 2)$  (max Compression = 48dB poiche' Cmp Thr = -30 to +18 ) (inX = 0,...,120; step dB = 0.5)

**CLOSE ALL DEVICES: CMD=8FH  
 (only usb and RS485)**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	42H	XX	8FH	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**There is not acknowledge.**

**VUMETER\_IN\_CMD : CMD=55H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	55H	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	55H	In1	In2	In3	In4	In5	In6	In7	In8	F7H

In1,...,I8 are the value already in dB of the input signal  
 $dB = -60 + (InX / 2) + 18$  (max level=+18) (inX = 0,...,120; step dB = 0.5)

**VUMETER\_OUT\_CMD: CMD=56H**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	56H	00H	00H	00H	00H	00H	00H	00H	00H	F7H

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	56H	In1	In2	In3	In4	In5	In6	In7	In8	F7H

In1,...,I8 are the value already in dB of the output signal  
 $dB = -60 + (InX / 2) + 18$  (max level=+18) (inX = 0,...,120; step dB = 0.5)



**INC\_DECR\_GAIN\_CMD: CMD=30H**  
**command Increase/Decrease input/output Level**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	30H	Chn	Flag	00H	00H	00H	00H	00H	Value	F7H

Where:

**Chn** = 0,...,15 - In1,...,In8=0,1,2,3,...,7; Out1,...,Out8 = 8,...,15

**Flag** = 0,1 - decrease level = 0; Increase level = 1;

**Value** = 0,...,x step of the increase/decrease level

if Value = 01h then the level will be increased/decreased of 0.1dB,

if Value = 0Ah then the level will be increased/decreased of 1dB,

if Value = x then the level will be increased/decreased of (0.1 \* x) dB.

If the level is to max or min the system maintain the min or max value

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	30H	Chn	Flag	00H	00H	00H	00H	00H	Value	F7H

**MUTE\_UNMUTE\_CMD: CMD=33H**  
**single Mute/Unmute input/output**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	33H	Chn	00H	00H	00H	00H	00H	00H	Value	F7H

**Chn** = 0,...,15 - In1,...,In8=0,1,2,3,...,7; Out1,...,Out8 = 8,...,15

**Value** = 0,1 0=Unmute; 1=Mute

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	33H	Chn	00H	00H	00H	00H	00H	00H	Value	F7H

**INC\_DECR\_GAIN\_LINKED\_CMD: CMD=2FH**  
**Increase/Decrease input/output Level linked channel**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	2FH	Sel IO	Flag	ChLink	00H	00H	00H	00H	Value	F7H

Where:

**Sel I/O** = 0,1 - 0=Input; 1=Output

**Flag** = 0,1 - decrease level = 0; Increase level = 1;

**Value** = 0,...,x step of the increase/decrease level

if Value = 01h then the level will be increased/decreased of 0.1dB,

if Value = 0Ah then the level will be increased/decreased of 1dB,

if Value = x then the level will be increased/decreased of (0.1 \* x) dB.

**ChLink (8bit)** = one bit for each input or output (**with 1 input/output selected**)

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
In8/Out8	In7/Out7	In6/Out6	In5/Out5	In4/Out4	In3/Out3	In2/Out2	In1/Out1

**Examples**

to increase the level of 1dB on input1 and input5, the user must send the following frame:

F0h	46h	ID	2Fh	00h	01h	11h	00h	00h	00h	00h	Value	F7h
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**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	2FH	Sel IO	Flag	ChLink	00H	00H	00H	00H	Value	F7H

**INC\_DECR\_MASTERGAIN\_CMD: CMD=31H**  
**Increase/Decrease MasterGain Level (only Input)**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	31H	00H	Flag	00H	00H	00H	00H	00H	Value	F7H

Where

**Flag** = 0,1 decrease level = 0; Increase level = 1;**Value** = 0,...x step of the increase/decrease level

if Value = 01h then the input master level will be increased/decreased of 1%,

if Value = 0Ah then the input master level will be increased/decreased of 10%,

if Value = x then the level will be increased/decreased of (1 \* x) %

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	31H	00H	Flag	00H	00H	00H	00H	00H	Value	F7H

**INC\_DECR\_MASTERVOLUME\_CMD: CMD=32H**  
**Increase/Decrease MasterVolume Level (only Output)**

**TX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	32H	00H	Flag	00H	00H	00H	00H	00H	Value	F7H

Where:

**Flag** = 0,1 decrease level = 0; Increase level = 1;**Value** = 0,...x step of the increase/decrease level

if Value = 01h then the output master level will be increased/decreased of 0.1dB,

if Value = 0Ah then the output master level will be increased/decreased of 1dB,

if Value = x then the output master level will be increased/decreased of (0.1 \* x) dB.

**RX:**

STX	ID_M	ID_N	CMD	D0	D1	D2	D3	D4	D5	D6	D7	ETX
F0H	46H	XX	32H	00H	Flag	00H	00H	00H	00H	00H	Value	F7H



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**WARNING:** where affixed on the equipment or package, the barred waste bin sign indicates that the product must be separated from other waste at the end of its working life for disposal. At the end of use, the user must deliver the product to a suitable recycling centre or return it to the dealer when purchasing a new product. Adequate disposal of the decommissioned equipment for recycling, treatment and environmentally compatible disposal contributes in preventing potentially negative effects on the environment and health and promotes the reuse and/or recycling of equipment materials. Abusive product disposal by the user is punishable by law with administrative sanctions.



*All informations included in this operating manual have been scrupulously controlled; however FBT is not responsible for eventual mistakes. FBT Elettronica SpA has the right to amend products and specifications without notice.*

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