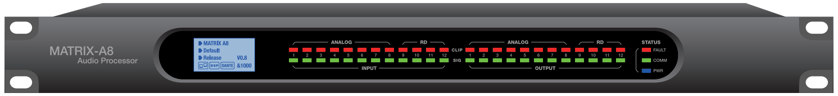
MATRIX-A8

DIGITAL AUDIO PLATFORM


MATRIX-A8
Audio Processor
ANALOG
RD
CLIP
SIG
INPUT
ANALOG
RD
OUTPUT
STATUS
FAULT
COMM
PWR

USER MANUAL

Safety Instructions

READ CAREFULLY THE FOLLOWING INSTRUCTIONS

⚡ **CAUTION** ⚠
RISK OF ELECTRIC
SHOCK NOT OPEN

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

⚡ This symbol indicates the presence of a dangerous voltage.

⚠ This made symbol refers to information in the instructions manual.

POWER SUPPLY
Connect the appliance only on a current corresponding to the characteristics listed in the back of the device. Failure to observe this precaution could result in fire or electric shock, or a failure not covered by the warranty.

POWER CORD
Before using the appliance for the first time, check that the supply voltage is consistent with that of the sector. Before connection to the mains check that the power cord is properly plugged. Route the power cord so that it cannot be squashed or bent and keep it away from moisture and significant heat sources. In case of deterioration or failure please contact dealer to replace it with an identical cord. A damaged cord may result in fire or electric shock.

PROTECTIVE GROUND
The appliance must be connected to the ground, don't remove the ground wiring of the power cord connector.

HUMIDITY
Do not expose the unit to rain or moisture and do not place container containing a liquid that might tip over. Do not handle any connector with wet hands. In case of thunderstorm, turn the unit off and disconnect it from any power outlet.

HEAT
Do not install the unit in a place subject to excessive heat or direct radiation from the Sun. Operating ambient temperature must not be below 5 ° C (41 ° F) or above 35 ° C (95 ° F).

DAMAGE
Unplug immediately in the event of introduction of liquids or objects in the device as well as in the event of damage to the power cable. Also unplug the unit if it emits smoke, an odor, or unusual noise.

DISPOSAL

This symbol indicates that the disposal of this product is submitted to local regulations. Please contact your local dealer.

RPM-200 Paging Station

MIC Input
- Active balanced
- Connector: 3-pin female XLR
- Phantom Power: +24 VDC @ 100 mA On/off in software

Indicators and switch
- LCD Display: Zone activation
- LEDs: Signal Status
- Switch: Push to Talk

Ports
- RD net to Matrix: RJ45, 100 m CAT 5e cable
- USB: For MP3 Chimes Sound file (4 seconds)

Dimensions
- L x H x D: 166 x 53 x 162 mm

RVC-100D Touch Screen Volume Controller

4.3” LCD Touch Sensitive Display
- Connection Status
- ID Number
- Volume
- Model
- Channel Selection

Ports
- RD net to Matrix: RJ45, 100 m CAT 5e cable
- RD net LINK: RJ45, 100 m CAT 5e cable

Dimensions
- L x H x D: 150 x 115 x 28

RD-100EX Remote Ports Expander

Ports
- 1 x RD net to Matrix: RJ45, 100 m CAT 5e cable
- 3 x RD net LINK to RVC-1000 & RVC-100D: RJ45, 100 m CAT 5e cable
- 1 x RD net LINK to RVA-200, RPM-200 & RIO-200: RJ45, 100 m CAT 5e cable

Power Supply
- 24 V/DC

Dimensions
- L x H x D: 196 x 45 x 128

RIO-200 Remote Audio I/O

Inputs
- Active Balanced
- Connectors : 3-pin female XLR, RCA
- Input Impedance : 5.1 kΩ
- THD+N: < 0.01 % typ 20-20k Hz, +4 dBu
- Maximum Input: 20.0 dBu
- Frequency Response: 20-20k Hz, +0, -.05 Db
- Dynamic Range: 105 dB max, A weighted
- Crosstalk: 104 dBu , 20-20k Hz, +20 dBu, ch to ch

Outputs
- Active Balanced
- Connectors : Euroblock 1 x 6-pin, 5 mm pitch
- Impedance: 200 Ω 1%
- Maximum Output: +20.0 dBu
- Frequency Response: 20-20k Hz
- Dynamic Range: 105 dBu
- Crosstalk: 104 dB

Indicators
- Signal : -50 dBu Green LED, peak-reading
- Overload : -0.5 dBu Red LED, peak-reading

Ports
- RD net to Matrix: RJ45, 100 m CAT 5e cable

Dimensions
- L x H x D: 147 x 86 x 47 mm

RVA-200 Volume Controller with Audio Out

Analog Outputs x 2
- Active Balanced
- Connectors : Euroblock 1 x 6-pin, 5 mm pitch
- Impedance: 200 Ω 1%
- Maximum Output: +20.0 dBu
- Frequency Response: 20-20 kHz
- Dynamic Range: 105 dBu
- Crosstalk: 104 dB

LCD Display
- Volume range: -120dB - 0dB

Ports
- RD net to Matrix:: RJ45, 100 m CAT 5e cable

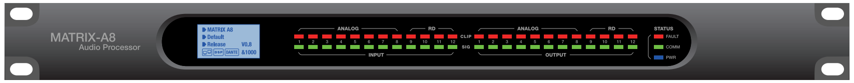
Dimensions
- L x H x D: 147 x 86 x 47 mm

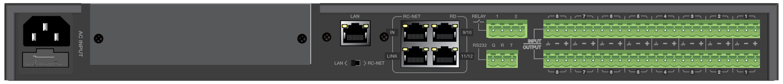
Table of Contents

A. Introduction ………………………………………………………………………........ 4
B. Main Features …………………………………………………………………….... 4
  1. 20 x 20 Digital Matrix ………………………………………………..…. 4
  2. DSP functions ………………………………..……………………..…. 5
  3. Networks ………………………………..………………………….…. 5
C. Front Panel Description ………………………...…………………………….... 7
D. Rear Panel Description …….…………..………………………………………..…. 8
E. MATRIX-A8 Connection ……………………………………………………...…. 10
  1. Stand-alone System……………………………..…………….... 10
  2. System with Dante Moudule 11
F. Software Editor ………………………………………………….…………….…. 13
  1. Input DSP Channel ………………………..…………….............. 13
  2. Matrix ………………………………………..………………..……..…. 16
  3. Output DSP Channel ………………………………………………….. 17
  4. Ducker ……………………………………………………………………. 18
  5. Feedback Canceller FBC …………………………………………….. 19
  6. AutoMixer ………………………………..……………………..……….. 21
  7. Save Load ……………………………….……………………………….. 22
  8. System …………………………………………………………………..…... 23
G. Remote Controllers ………………………………………….…………..………. 24
  1. RPM-200 Paging Station ……………………………………………..….. 24
  2. RVC-1000 Volume Controller …………………………………………. 26
  3. RVA-200 Volume Controller with Audio Out……………………….. 27
  4. RIO-200 Remote Audio I/O …………………………………………. 28
  5. RVC-100D Touch Screen Volume Controller ……………………..…. 29
  6. RD-100EX Remote Port Expander …………………………………. 31
H. Application Examples…………………...…………………….……………..…. 32
I. Appendix ………………………………………………………………………. 36
J. Specifications ………………………………………………………………………. 37

A Introduction

Thank you for purchasing the MATRIX-A8. This device is dedicated music, paging, discussion and zone management solutions for Commercial Audio applications.
Easy to use and to implement, MATRIX-8 offers state-of-the-art signal processing in a cost effective package.





B Main Features

1- 20 x 20 Digital Matrix

Projects using DSP platforms usually require a minimum number of inputs and outputs. This determines the choice of dedicated matrix models. MATRIX-A8 offers a large choice of I/O options in order to cover most of applications:

I/O:

- 8 analogue IN / 8 analogue OUT on rear panel ports
- 4 digital IN / 4 digital OUT via remote panels analog I/O
- 8 digital IN / 8 digital OUT via DANTE optional card

The basic system features 12 IN x 12 OUT. With the DANTE option, it offers 20 IN x 20 OUT. I/O expansion is possible with 16 pcs devices linked together for a maximum of 192 x IN and 192 x OUT.

J Specifications

MATRIX-A8

Analog I/O 8 x 8

• Connectors :	Euroblock 4 x 6-pin, 5 mm pitch,
• CODEC :	CS4272, 24-bit, 48 kHz

MIC Inputs

• Active balanced	
• Gain Settings:	+10 to +60 dB ,1 dB steps
• Input Impedance:	2.6 kΩ 1%,1 kHz, each leg to ground
• Phantom Power:	+48 VDC, 10 mA max per input
• THD+N:	< 0.01 % ,typ 20-20k Hz, +4 dBu
• Maximum Input:	3 dBV (1.4 Vrms)

Line Inputs

• Active balanced	
• Gain Settings:	+10 to +20 dB ,1 dB steps from +10 to +20
• Input Impedance :	5.1 kΩ
• THD+N:	< 0.01 % typ 20-20k Hz, +4 dBu
• Maximum Input:	20.0 dBu
• Frequency Response:	20-20k Hz, +0, -0.5 dB
• Dynamic Range:	105 dB max, A weighted
• Crosstalk:	104 dBu , 20-20k Hz, +20 dBu, ch to ch

Outputs

• Active balanced	
• Impedance:	200 Ω 1%
• Maximum Output:	+20.0 dBu
• Frequency Response:	20-20k Hz
• Dynamic Range:	105 dBu
• Crosstalk:	110 dB

Indicators

• Signal :	-50 dBu Green LED, peak-reading
• Overload :	-0.5 dBu Red LED, peak-reading

DSP

• Processor :	SHARC ADSP-21489, 450 MHz
• Word Length:	32 / 64-bit Floating Point

Dimensions

• L x H x D:	483 x 44 x 256 mm

RVC-1000 Volume Controller

LCD Display

• Adjustable volume range:	-120dB - 0dB

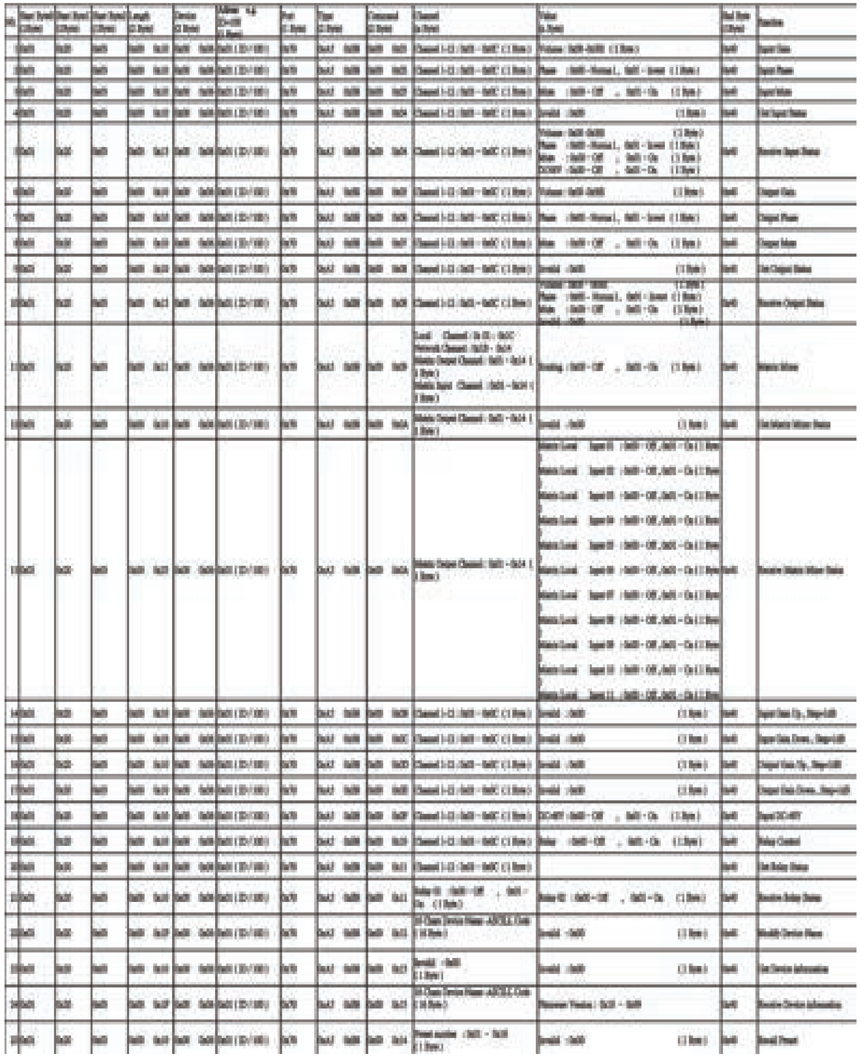
Ports

• RD net to Matrix:	RJ45, 100 m CAT 5e cable
• RD net LINK:	RJ45, 100 m CAT 5e cable

Dimensions

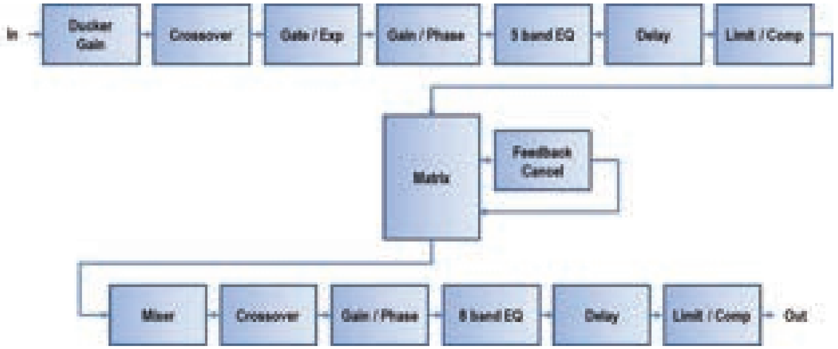
• L x H x D:	147 x 86 x 47 mm

RS232 Codes



2. DSP functions

MATRIX-A8 is intended for non-experts. The system used fix architecture for quick and easy operation. The intuitive GUI utilizes a familiar hardware-like layout to enable a short programming timeline and rapid hardware implementation.


In
Ducker Gain
Crossover
Gate / Exp
Gain / Phase
5 band EQ
Delay
Limit / Comp
Matrix
Feedback Cancel
Mixer
Crossover
Gain / Phase
8 band EQ
Delay
Limit / Comp
Out

All functions can be configured with the PC Editor Software. Settings can be memorized for easy duplication or modification:

3. Networks

MATRIX-A8 uses four types of network connections:

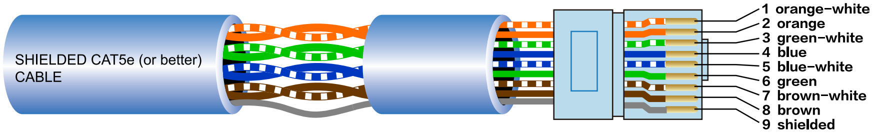
- **RCNET**, based on RS-485 for MATRIX-A8 daisy chain control.
- **RD**, based on RS-485 for panel control and AES3 for digital audio transport.
- **DANTE** for multi-channel digital audio transport.
- **TCP/IP** for LAN control.

Cable connections for Remote Controllers (RD ports)

Use shielded CAT 5e (or better) cable to connect the remote controllers to the RD ports. The maximum transmission distance is **100 meters**. If in wall-mounted controllers can be connected to the ground (except the Paging Station), the distance can be increased up to 150 meters.

Never connect a RD port to the router; this can cause damage to the devices.

The port can transmit and receive AES3 plus control signal, the following graphic illustrates the termination and also shows function of each wire pair on the network:


SHIELDED CAT5e (or better) CABLE
1 orange–white
2 orange
3 green–white
4 blue
5 blue–white
6 green
7 brown–white
8 brown
9 shielded

The green pair is reserved for data communications between Matrix A8 and remote device. Data communication is needed to send configuration information, software update and status information from Matrix A8 to remote device.

Note: Configuration information of remote controllers (such LED illuminate status, microphone sensitivity, channel name, etc.) is stored in Matrix A8, not in the remote devices. This makes easy to swap for a new remote box without losing the configured information.

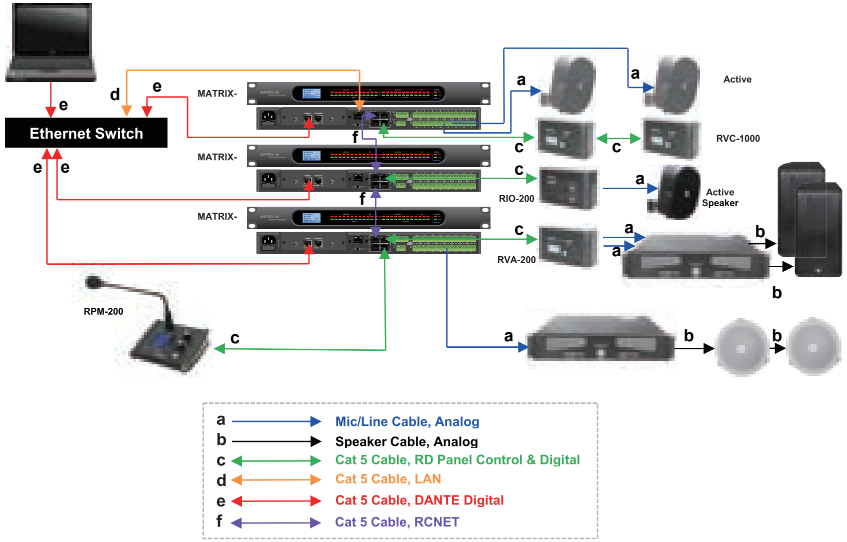
The orange and blue pairs carry two channels each of balanced differential AES3 digital audio. **TX** refers to audio that the remote device sends to Matrix A8, **RX** refers to audio that remote device receives from Matrix A8.

The brown pair provides 24VDC power and ground for the controllers.

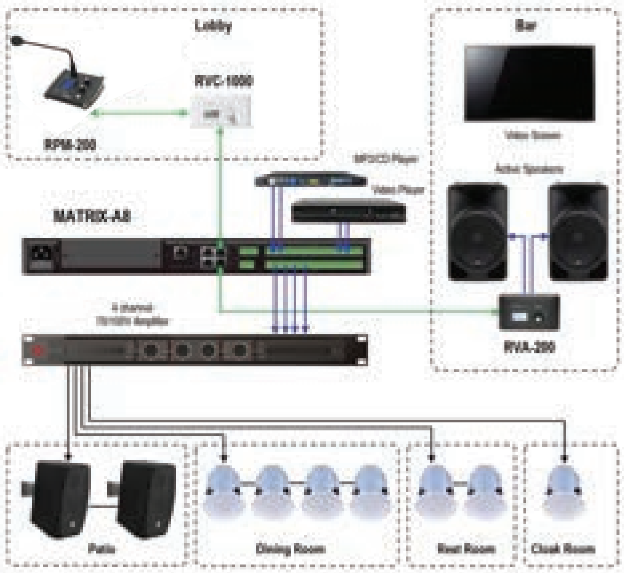
Pins meaning of RD port :

1 -	AES TX+	5 -	RS485 RX
2 -	AES TX-	6 -	AES RX-
3 -	AES RX+	7 -	DC24V
4 -	RS485 TX	8 -	GND

Example of connection:


Ethernet Switch
d
e
e
e
e
MATRIX-
MATRIX-
MATRIX-
f
f
a
a
Active
c
c
RVC-1000
c
RIO-200
a
Active Speaker
c
RVA-200
a
a
b
b
RPM-200
c
a
b
b
a Mic/Line Cable, Analog
b Speaker Cable, Analog
c Cat 5 Cable, RD Panel Control & Digital
d Cat 5 Cable, LAN
e Cat 5 Cable, DANTE Digital
f Cat 5 Cable, RCNET

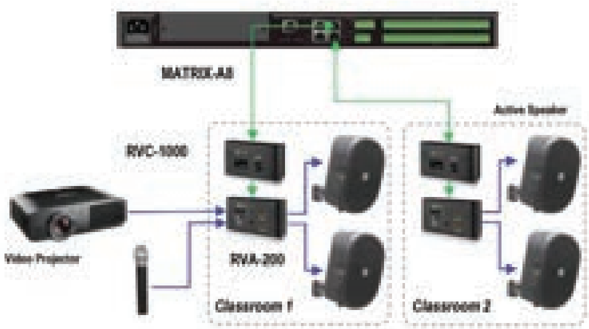
RESTAURANT / BAR


Lobby
RVC-1000
RPM-200
MP3/CD Player
Video Player
MATRIX-A8
4 channel 70/100V Amplifier
Bar
Video Screen
Active Speakers
RVA-200
Patio
Dining Room
Rest Room
Cloak Room

Easy and quick volume control for operators

4 analog outputs of MATRIX-A8 are used for 4 separate zones with volume controlled from the lobby (RVC-1000). Two additional line out come from the RVA-200 remote controller using digital connection from the MATRIX-A8. It feeds the bar area where RVA-200 remote can be replaced by RIO-200 In/Out interface for DJ show or Karaoke session.

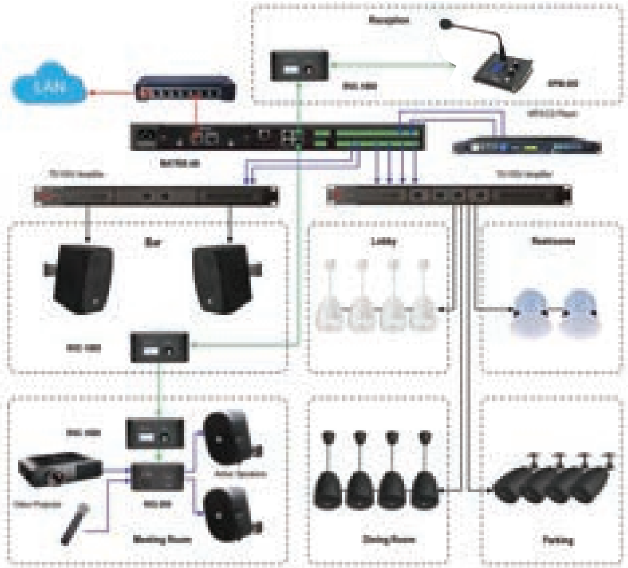
SCHOOL


MATRIX-A8
RVC-1000
Active Speaker
Video Projector
RVA-200
Classroom 1
Classroom 2

Plug and play

Easy and quick AV system to set up in a classroom. To avoid wrong manipulations from non-authorized person, only volume controls are available. All other DSP functions like EQ or Ducking dedicated to each room can be set by the system administrator using the Matrix-A8 Editor software.

HOTEL

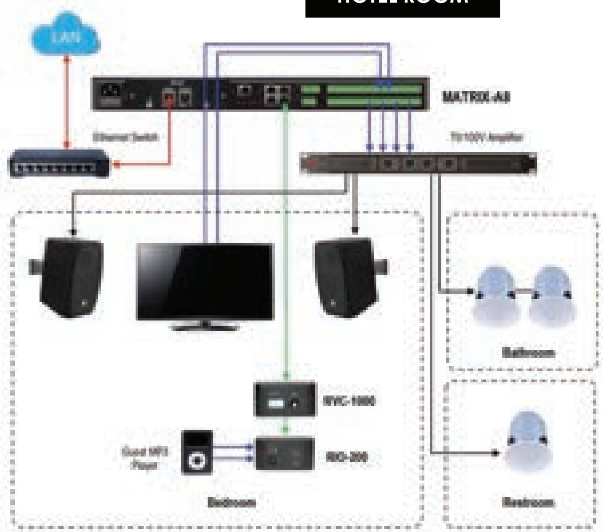

LAN
Bar
Lobby
Meeting Room
Dining Room
Parking

Simple multi-audio service and distribution

6 zones including 8 audio signal paths are individually processed by MATRIX-A8.

Remote boxes are daisy chained, including RIO-200 I/O for mic and line signal directly operated by a local user in the meeting room. Paging and volume for every zone are controlled from the reception.

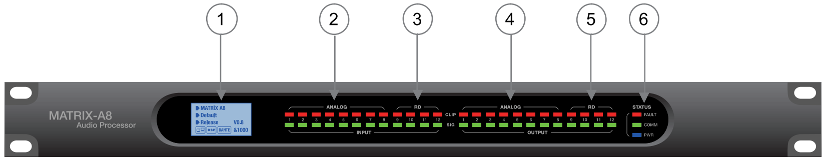
HOTEL ROOM


LAN
MATRIX-A8
Ethernet Switch
70/100V Amplifier
RVC-1000
RIO-200
Guest MP3 Player
Bedroom
Bathroom
Restroom

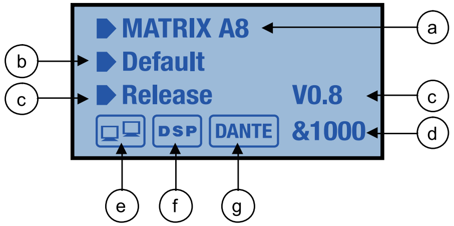
Personal audio service

Hotel guests can plug MP3/cell phone into RIO-200 and control sound volume with RVC-1000 as well as TV, in the main room, bathroom and restroom. Hotel program and vocal message are distributed from a Dante connection via LAN.

C Front Panel Description


1
2
3
4
5
6
MATRIX-A8
Audio Processor
ANALOG
RD
ANALOG
RD
STATUS
INPUT
OUTPUT

1. **LCD Display**
   It displays device information, such as name, firmware, ID and communication status.


MATRIX A8
Default
Release
V0.8
DSP
DANTE
&1000
a
b
c
c
d
e
f
g

- **a.** Device name.
- **b.** Current preset.
- **c.** Current release software version.
- **d.** Current ID. The ID is automatically obtained when the device in correctly connected.
- **e.** Connection indicator between the PC and the device. If the connection is okay, both icons in the box will flash alternately.
- **f.** DSP connection indicator. In case of problem " **DSP !** " will be displayed.
- **g.** Optional DANTE card indicator. The icon appears when the car is available in the rear slot.

2. **ANALOG**
   Analog input indicators. The Green LED indicates presence of signal, the Red LED indicates signal clipping of the corresponding input.

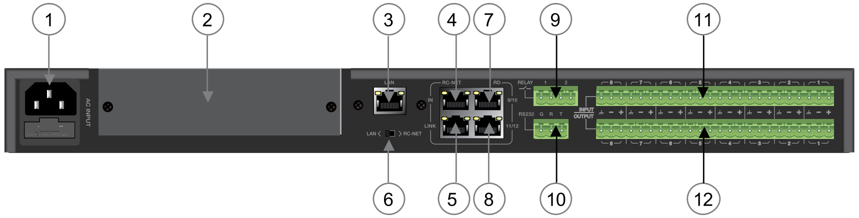
3. **RD**
   RD digital input indicators. The Green LED indicates presence of signal, the Red LED indicates signal clipping of the corresponding input.

4. **ANALOG**
   Analog output indicators. The Green LED indicates presence of signal, the Red LED indicates signal clipping of the corresponding output.

5. **RD**
   RD digital output indicators. The Green LED indicates presence of signal, the Red LED indicates signal clipping of the corresponding output.

6. **STATUS**
    - **FAULT**
      Red LED indicating a malfunction of the DSP. The information is relayed on the LCD screen.
    - **COMM**
      Green LED indicating the communication status between the PC and the device. The LED blinks during data transfer.
    - **PWR**
      Blue LED indicating that the unit is powered.

D Rear Panel Description


1
2
3
4
7
9
11
AC INPUT
LAN
RC-NET
RELAY
RS232
INPUT
OUTPUT
LINK
6
5
8
10
12

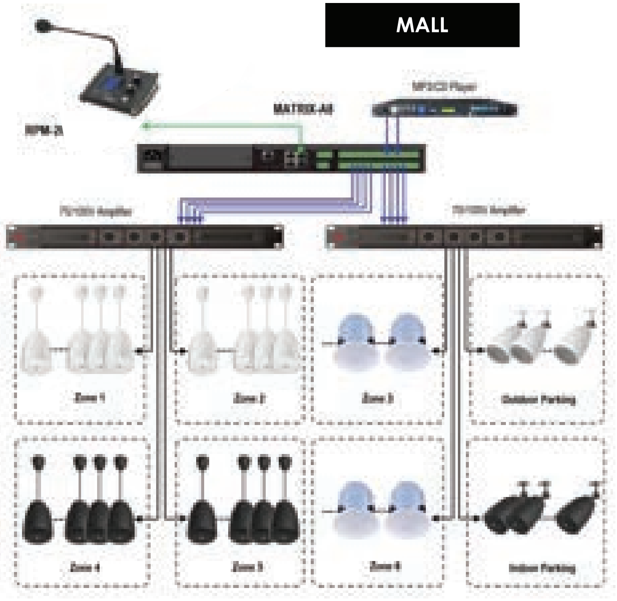
1. **Power Socket**
   The power socket must be used with a quality cord. In case of failure the cord must be replaced. Do not try to fix it. The supply voltage is between 100 V and 240 VAC, 50-60 Hz, depending on countries.
   The socket includes the fuse compartment. When changing it, make sure to replace it with a model of the same characteristics.

2. **Optional Module Compartment**
   This location is reserved for the optional DANTE card. However, it can be used by other expansion modules.

3. **LAN**
   Port for the Ethernet connection. The plug includes two LEDs, a green one indicating the good connection to the network and a yellow one indicating the good data transmission.
    - If the yellow LED turns Off, there is a transmission problem. If On, with Green LED Off, the device has detected the network, but there is no connection.
    - If the Green LED is on, the network connection is correct.

4. **RC-NET / IN**
   This port transports control and command data based on RS-485 format. It is used to link several MATRIX-A8.

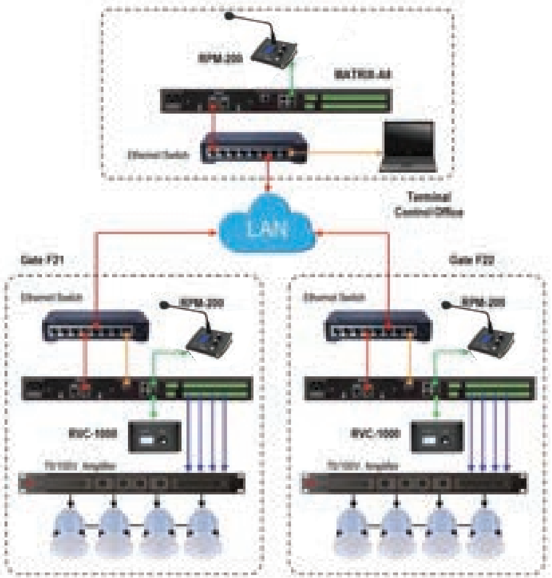
MALL


RPM-A
MATRIX-A8
MP3/CD Player
70/100V Amplifier
70/100V Amplifier
Zone 1
Zone 2
Zone 3
Outdoor Parking
Zone 4
Zone 5
Zone 6
Indoor Parking

Control up to 12 independent zones with a single MATRIX-A8

MATRIX-A8 feeds 2 x 4 analog inputs of 70/100 V amplifiers. Each amplifier offers 4 individual lines of high impedance speakers to broadcast BGM program in separate zones. For more zones, 4 additional OUT are available by using 2 x RIO-200 controllers and their 2 channel analog outputs.

TRANSPORT TERMINAL


RPM-200
MATRIX-A8
Ethernet Switch
Terminal Control Office
LAN
Gate F21
Gate F22
Ethernet Switch
RPM-200
RVC-1000
70/100V Amplifier
Ethernet Switch
RPM-200
RVC-1000
70/100V Amplifier

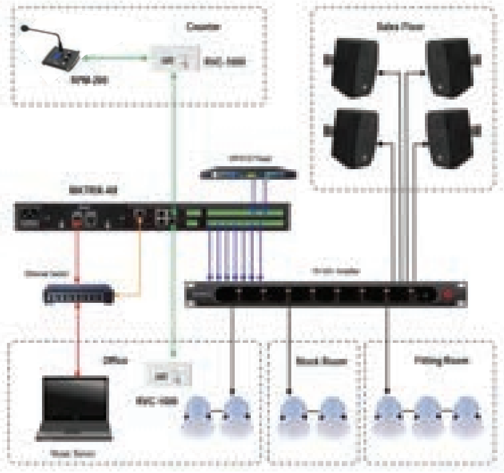
Large installation through LAN control

For all gate areas, priority announcements come from a Dante network through LAN. Every gate can broadcast its local message with individual volume control in 4 different zones, or more (up to 8).

Expandability of the system is quite easy. Every new installed gate used the same device pack, without any limit in the number of MATRIX-A8.

H Applications Examples

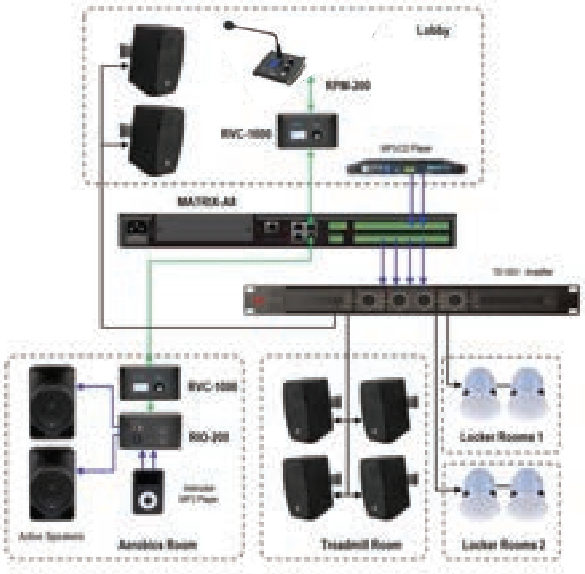
RETAIL STORE


Counter
RPM-200
RVC-1000
Sales Floor
MATRIX-A8
Office
RVC-1000
Stock Room
Fitting Room
Music Server

Simple installation with ambiance control

The 4 zone volumes are individually controlled from the office or from the counter with stereo or mono signals. MATRIX-A8 is equipped with an optional Dante card to get the BGM programs from a music server. The computer can be used to edit the MATRIX-A8 as well.

GYM


Lobby
RPM-200
RVC-1000
MATRIX-A8
RVC-1000
RIO-200
Active Speakers
Aerobics Room
Treadmill Room
Locker Rooms 1
Locker Rooms 2

Flexible sound control

Volume in 4 zones can be controlled from the lobby by remote RVC-1000.

In Aerobics Rooms, instructors can play dedicated music via MP3 player connected to RIO-200 input/output. Volume is controlled with a specific RVC-1000 device.

---

5. **RC-NET / LINK**
RC-NET output port to connect to RC-NET input port (4) of another MATRIX-A8.
.

6. **LAN / RC-NET**
Switch to assign either Ethernet or RC-NET format to the LAN port (3).

7. **RD 9/10**
RD Port to connect remote controllers such as **RIO-200**, **RVA-200**, **RPM-200, RVC-1000** and **RVC-100D** (refer to page 23).
This port transmits and receives AES3 digital audio plus control data (refer to pages 5 & 6). RIO-200 for instance, includes A/D and D/A converters for two I/O assigned to channels 9 and 10.

8. **RD 11/12**
Similar to port RD 9/10 **(7)** but assigned to channels 11 and 12.

9. **RELAY**
Dry contacts where ON/OFF status can be individually controlled in the **System** menu (Please refer to page 23).
They are generally used as switches for third party electrical equipment.

10. **RS232**
This interface is used to remotely control MATRIX-A8 parameters, such as a Preset change or a modification of the gain for one channel.
Please refer to Appendix page 35 to consult the code table.

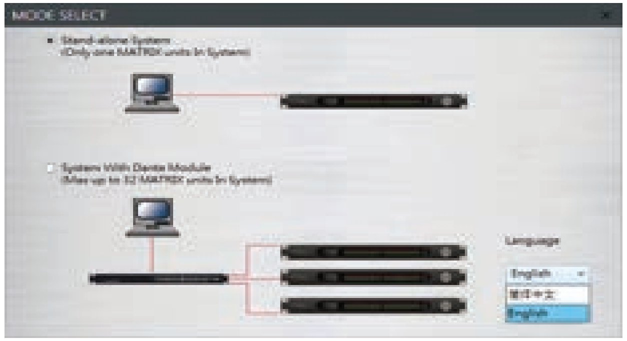
11. **INPUT**
Euroblock connector including 8 balanced analog inputs.

12. **OUTPUT**
Euroblock connector including 8 balanced analog outputs.

E MATRIX-A8 Connection

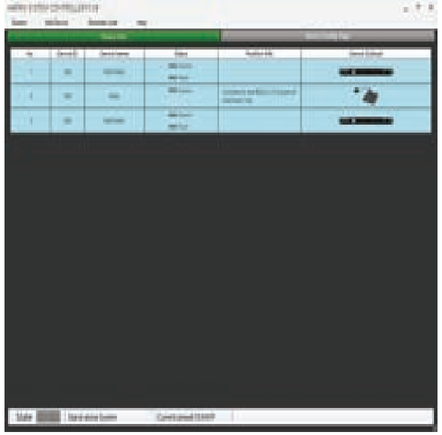
MATRIX-A8 can be programmed by using the Editor Software available for the device. It works with Windows 7 and above.

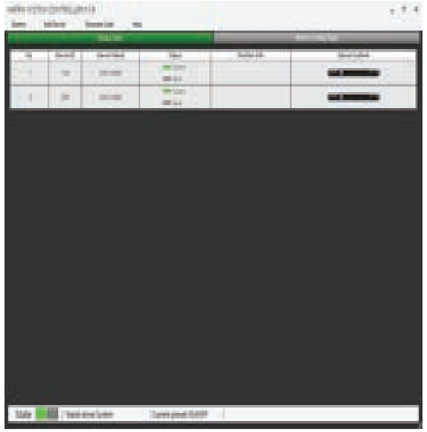
The communication with the computer is implemented via a network environment, so compatible IP addresses must be specified.
Two connection modes are available, Stand-alone System and System With Dante Module.


MODE SELECT
■ Stand-alone System
(Only one MATRIX units In System)
☐ System With Dante Module
(Max up to 32 MATRIX units In System)
Language
English
繁體中文
English

1. Stand-alone System

This mode is mainly used for several independent MATRIX-A8 controlled with the same computer in the same LAN environment. The stand-alone system don't requires a router.
To start the Editor, just make the connection as shown in the Selection Mode windows.
After opening the system controller, you need to select mode and language first, and use stand-alone mode when you do not insert Dante card, otherwise it is Dante network mode. Selecting the Stand-alone System, click Enter, them the following page opens.

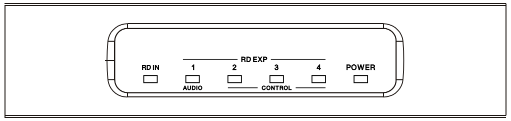




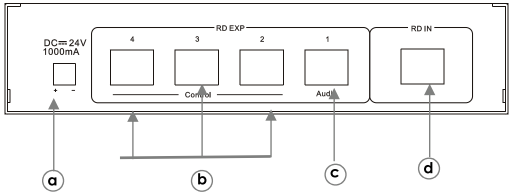
As you can see, these interface show the off-line and online status under stand-alone system, including all the MATRIX-A8 devices connected to the computer, name, ID and device outlook in it. If the Green LED is on, the network connection is correct.

---

6. RD-100EX Remote Port Expander

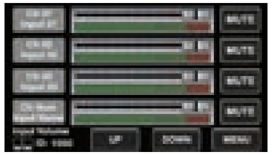

RD EXP
RD IN
1
2
3
4
POWER
AUDIO
CONTROL

The RD-100EX is a port expander featuring a star connection of the controllers.
This interface is particularly useful when daisy chain between devices is not possible or when the controllers are far away from the host.

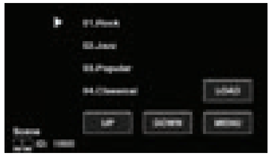

DC⎓24V
1000mA
+ −
RD EXP
4
3
2
1
Control
Audio
RD IN
a
b
c
d

a. 24V DC power supply
b. RD connections for RV-1000 and RV-100D (control data remote devices only) Up to 8 controllers per ports can be daisy chained.
c. RD connection for RAV-200, RIO-200 and RPM-200 (control and audio transport data remote devices).
d. RD connection with MATRIX-A8

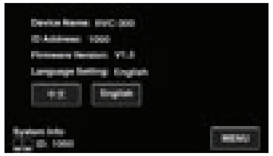
In the **Input** section , volume and mute can be adjusted and visually monitored.


MUTE
MUTE
MUTE
MUTE
UP
DOWN
MENU

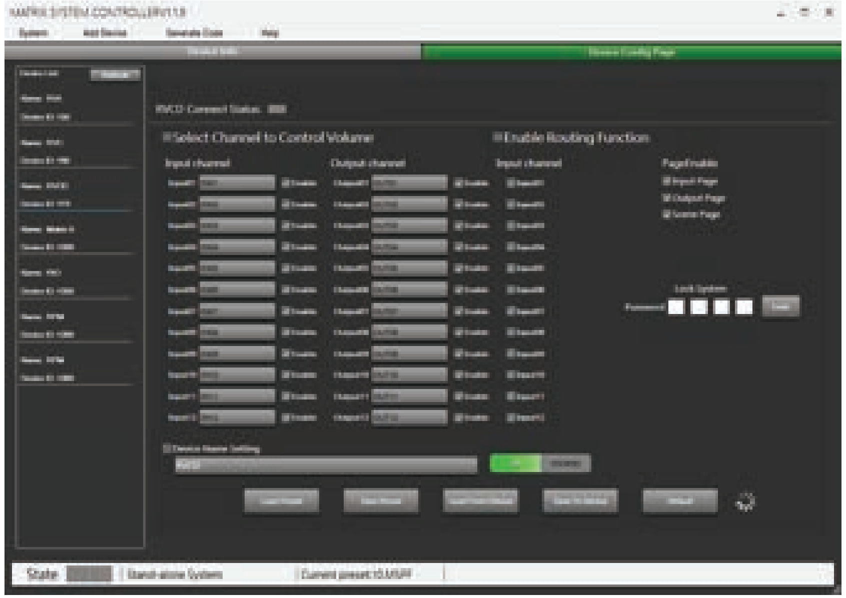
The **Scene** sub menu can call up setting presets memorized in the MATRIX-A8


01.Rock
02.Jazz
03.Popular
04.Classical
LOAD
UP
DOWN
MENU
Scene

The **System** section displays the firmware version, address and device name. It also switches the language option.


English
System Info
MENU

RVC-100D Editor (Refer to procedure page 11)


System
Add Device
Help
Select Channel to Control Volume
Enable Routing Function
Input channel
Output channel
Lock System
State
Stand-alone System

---

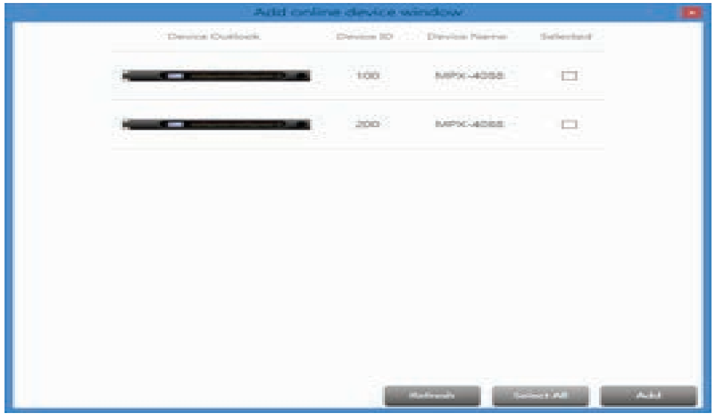
2. System with Dante Module

This mode is used when several MATRIX-A8 are linked together to create larger IN x OUT matrix systems.
Local area network (LAN) is required. This mode cannot be used when there is no router.
All you need to do is link the Dante module and the LAN port.
Important: If remote controllers are used in the system, never connect them directly to the router; it can cause damage to the devices.

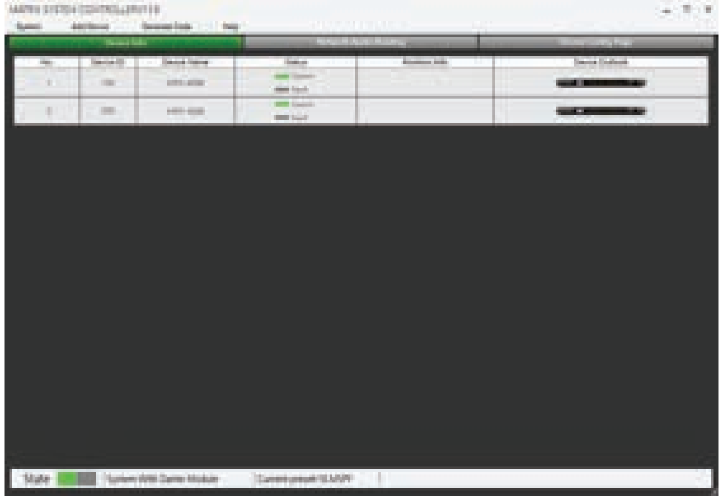
The router/switch only connects one line to the Dante port of the main computer and connect one line to the LAN port.

Once done, select System with Dante Module and click Enter.

Turning on < Add online device > ,automatically lists all online device information and selects the device you need to add to the list


Add online device window
Device Outlook
Device ID
Device Name
Selected
100
200
Refresh
Select All
Add

- Click Connect, the Status box becomes green ,meaning that the connection is well established. As shown in the following interface.

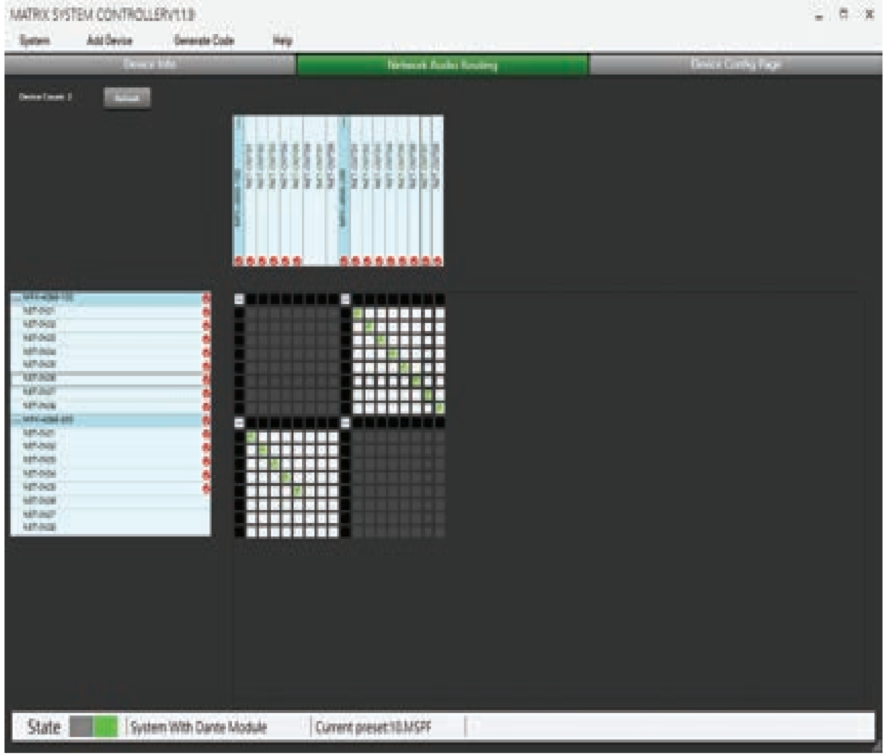

State
System With Dante Module

You can add offline devices by device type and corresponding ID type. When the matching device is connected, the device status will be changed from offline device to online device.

A device ID number is specified. Indication is similar on the LCD screen of the unit.
It can be changed by clicking right the box and validate Change Device ID instruction that appears. Enter the new ID number and validate.

Important
To create a larger IN x OUT matrix system with several MATRIX-A8, a DANTE optional card is necessary for each device.

Network Audio Routing
In the Dante network mode, the PC control software can automatically obtain the network audio routing status of all online < Matrix-A8 > and refresh the routing status 50 times.
Any click assignment/cancel assignment is 50 times and can be operated correctly.

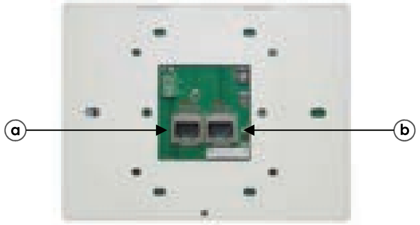

MATRIX SYSTEM CONTROLLERV1.1.0
System
Add Device
Generate Code
Help
Device Info
Network Audio Routing
Device Config Page
Refresh
State
System With Dante Module
Current preset:10.MSPF

Device Configuration Page
In this page, you can clearly see all the MATRIX-A8 device that connected to the computer, with IP and MAC address.

---

5. RVC-100D Touch Screen Volume Controller

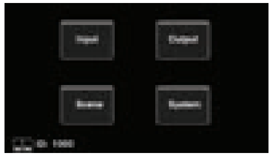
The **RVC-100D** is a wall mount 4.3'' LCD touch screen volume controller.
The volume control can be assigned to any output of the host. It can also route any input to any output like in Matrix menu of the Editor Software.



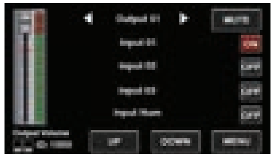
a. **RD port IN**
   Connection to MATRIX-A8. The maximum CAT 5e cable length is **100 meters**.

b. **RD port LINK**
   Daisy connection for additional remote controller (8 controllers max).

The device can set up four different sub menu pages, like **Input**, **Output**, **Scene** and **System.**

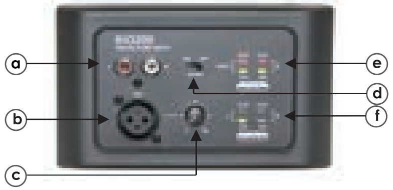

Input
Output
Scene
System
ID: 1000

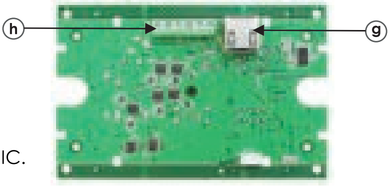
In the **Output** section, the routing function can assign any input to any output. Volume and mute can be adjusted and visually monitored.


Output 01
MUTE
Input 01
ON
Input 02
OFF
Input 03
OFF
Input Num
OFF
Output Volume
ID: 1000
UP
DOWN
MENU

4. RIO-200 I/O Remote

The **RIO-200** is a remote input and output module providing 2 x analog channels IN and 2 x analog channels OUT. The device includes build in A/D and D/A converters processing digital audio AES3 signals from and to the MATRIX-A8.





a. **2 Channel Inputs**
A & B analog line Inputs assigned to channels 9/10 or 11/12 of MATRIX-A8.

b. **Microphone Input**
XLR connector for MIC. If connected, it replaces the A channel input.

c. **Microphone volume**
Button to adjust the MIC input level.

d. **Phantom power**
48V switchable phantom power for electret MIC.

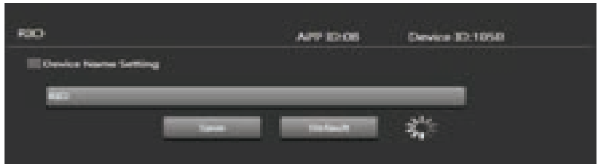
e. **Signal indicators for the Inputs**
Chanel A (MIC) and B input signal status indicators for signal presence and clip.

f. **Signal indicators for the Outputs**
Channel A and B input signal status indicators.

g. **RD Port**
Connection to MATRIX-A8. The maximum CAT 5e cable length is **100 meters**.

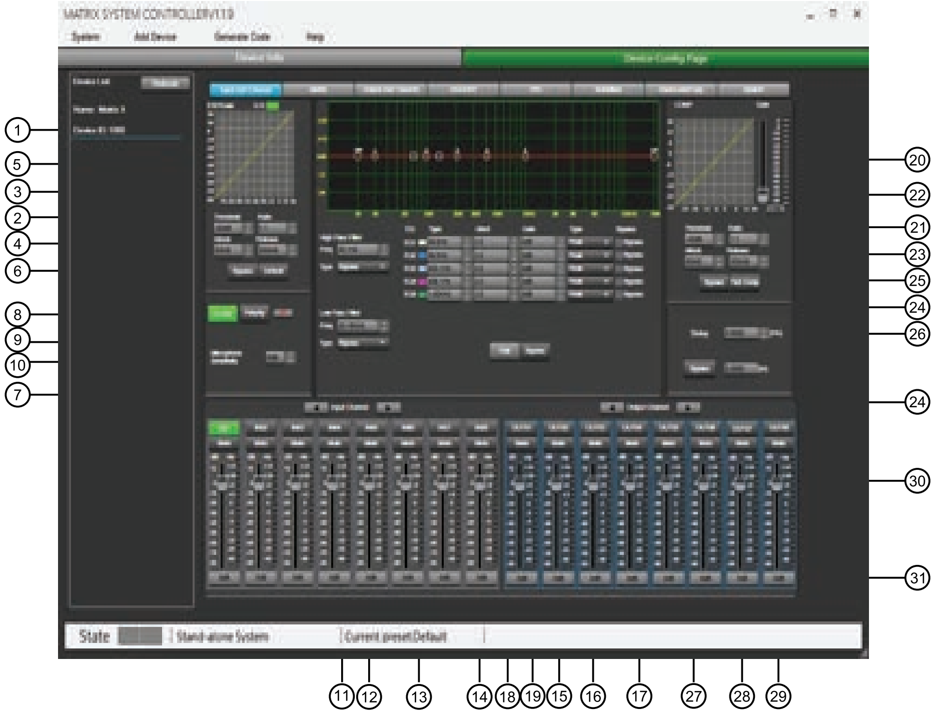
h. **2 Channel Outputs**
2 channel analog line Outputs assigned to RD port 9/10 or 11/12 of MATRIX-A8.

RIO-200 Editor (Refer to procedure page 11)


RIO
APP ID:08
Device ID:1058
Device Name Setting
RIO
Save
Default

F Software Editor

1 - Input DSP Channel


MATRIX SYSTEM CONTROLLERV1.1.0
System
Add Device
Generate Code
Help
Device Info
Device Config Page
State
Stand-alone System
Current preset:Default
①
⑤
③
②
④
⑥
⑧
⑨
⑩
⑦
⑳
㉒
㉑
㉓
㉕
㉔
㉖
㉔
㉚
㉛
⑪
⑫
⑬
⑭
⑱
⑲
⑮
⑯
⑰
㉗
㉘
㉙

The **Input DSP Channel** is the first page appearing when the Editor Software is opened.
1. Device Configure: The device list on the left side of the window automatically lists all configurable device information: name and device ID, refreshing 50 times to ensure that it does not conflict with the < Device Information > page. All equipment parameters were modified 50 times normally.
Device Information: Confirm the connection status by the < State > light in the lower left corner of the software, and disconnect/connect < Matrix-A8 > to ensure normal display status.
Device Preset: When the system preset is loaded, the system preset name will be displayed on the display of < Matrix-A8 > and the preset name will be displayed on the <Current preset> at the bottom of the software.

A - Expander/Gate
An Expander is used to add dynamics to a signal. When the signal is below a certain threshold the Expander boosts the input signal with a determined ratio. When the signal is beyond the threshold, the output signal remains identical to the input signal. By adjusting the value of the ratio to its maximum, the Expander is transformed into a Noise Gate.

2. **Threshold**: -80 dB to 20 dB.

3. **Ratio:** gain ratio between the input signal and the amplified signal, from 1:1 to 10:1.
4. **Attack**: reaction time when the signal is below the specified threshold, from 10 to 150 ms.
5. **Release**: reaction time of the Expander when the signal passes beyond the specified threshold from 0.01 to 1 second.
6. **Bypass**: the signal is not processed and skips to the next processing module.
7. **Default**: all parameters are reset to the default settings.
8. **DC 48V:** 48 V Phantom power for electret microphone.
9. **Polarity:** inverts the phase of the signal by 180 °.
10. **Microphone Sensitivity:** Input sensitivity for a microphone, from -48 dB to 0 dB.

B - EQ

High Pass and Low Pass Filters
Those filters are used to eliminate non necessary frequencies above and below the signal spectrum, in order to avoid any background noise generation due to multi-processing. For instance, a voice microphone will be set to 100 Hz for the High Pass and 4 kHz for the Low Pass.

11. **Freq**: Cut-off frequency

12. **Type**: Filter type
    Bessel 6,12, 24, 36 dB, Linkwitz 6,12, 24, 36 dB, Butterworth 6,12, 24, 36 dB.

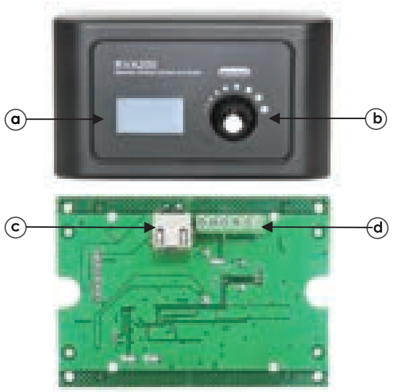
C - Parametric EQ
The equalizer is used to compensate or alter the spectral characteristics of the signal in order to obtain the flattest possible frequency response. The module here is a parametric 5 bands EQ.

13. **Freq**: central frequency of the filter between 20 Hz and 20,000 Hz.
14. **Qfact**: selectivity of the filter (Q). Greater is the value, thinner is the processed part of the spectrum. Can be adjusted from 0.4 to 128.
15. **Gain**: gain or attenuation of the center frequency, from -18 dB to +18 dB.
16. **Type:** Filter type, Peak / Low / High.
17. **Bypass 1~5**: temporarily cancels the individual processing of filters 1 ~ 5 without having to use the general “Bypass”.
18. **Flat**: all parameters are reset to the factory settings.
19. **Bypass**: the signal is not processed and skips to the next processing module.

Filters can be set manually by entering alphanumeric values, or graphically by clicking directly on the frequency response diagram and moving the mouse while holding the button pressed.

3. **RVA-200 Volume Controller with Audio Out**

The RVA-200 has the same functionality as the RVC-1000 volume control, but it includes 2 additional analog outputs. The device includes a build in D/A converter processing digital audio AES3 signals from MATRIX-A8.



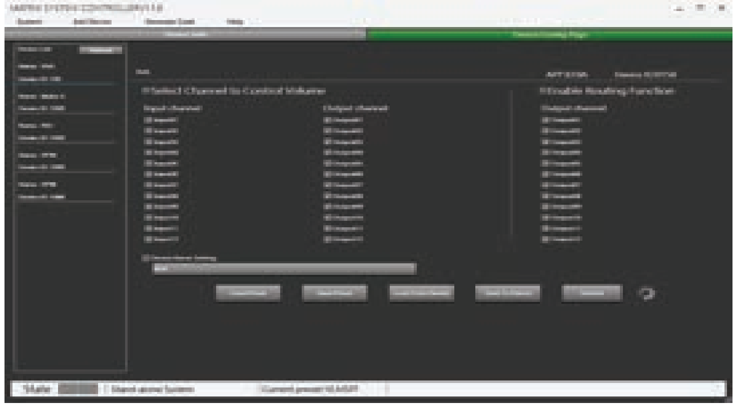
a. **LCD screen**
   It displays the volume level and the signal level for a dedicated output.

b. **Volume and routing control**
   Turn the button left or right to adjust the volume.
   Push the button to access to the inputs and outputs routing function.

c. **RD port**
   Connection to MATRIX-A8. The maximum CAT 5e cable length is **100 meters**.

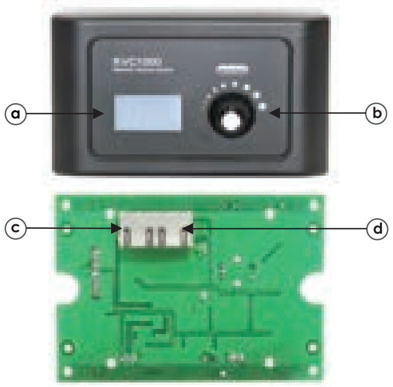
d. **Analog OUT**
   2 channel analog line Outputs assigned to RD port 9/10 or 11/12 of MATRIX-A8.

RVA-200 Editor (Refer to procedure page 11)



2. RVC-1000 Volume Controller

This volume controller can be assigned to any output of the MATRIX-A8. It can also route any input to any output like in the Matrix menu of the Editor Software.



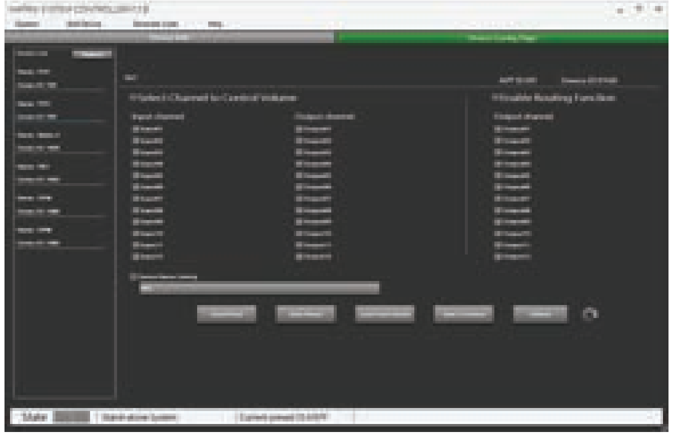
a. **LCD screen**
   It displays the volume level and the signal level for a dedicated output.

b. **Volume and routing control**
   Turn the button left or right to adjust the volume.
   Push the button to access to the inputs and outputs routing menu.

c. **RD port IN**
   Connection to MATRIX-A8. The maximum CAT 5e cable length is **100 meters**.

d. **RD port LINK**
   Daisy connection for additional remote controller (8 controllers max).

RVC-1000 Editor (Refer to procedure page 11)



D - Compressor

A compressor can limit the dynamics of a signal beyond a certain level. When the signal exceeds the **Threshold** it is compressed in a **ratio** greater than 1. Below the Threshold, input and output signals remain the same. By adjusting the ratio to its maximum value, the compressor is transformed into a limiter.

20. **Threshold**: threshold from which the signal is compressed, from -30 dB to +20 dB

21. **Ratio**: compression ratio. For instance, a 4:1 ratio means that the input level is 4 dB above the threshold, the output signal will be 1 dB above this threshold. The ratio value can be set from 10:1 to 1:1.

22. **Attack**: reaction time of the compressor when the signal is beyond the specified threshold, from 10 to 150 ms.

23. **Release**: reaction time of the Compressor when the signal is below the specified threshold, from 10 ms to 1 s.

24. **Bypass**: the signal is not processed and skips to the next processing module.

25. **Flat Comp** : all parameters are reset to the default settings.

E - Delay

26. A delay can be set for each input up to 1361 ms. It can be used for sound/video synchro applications or phase adjustment.

F - Input Selection (CH01-CH12)

27. To select the input to set up or edit, click on the corresponding channel number. For channels that do not appear on the screen use the arrows.

G - Mute

28. The **MUTE** button allows instant cut of the selected input. This allows to listen to one or more sources separately without having to touch the level controls.

H - Level Setting

29. The input and output level for each channel can be set with a linear fader. With the mouse button, drag the cursor upwards or downwards.
    One can directly input the value by double clicking on box **(31)**.

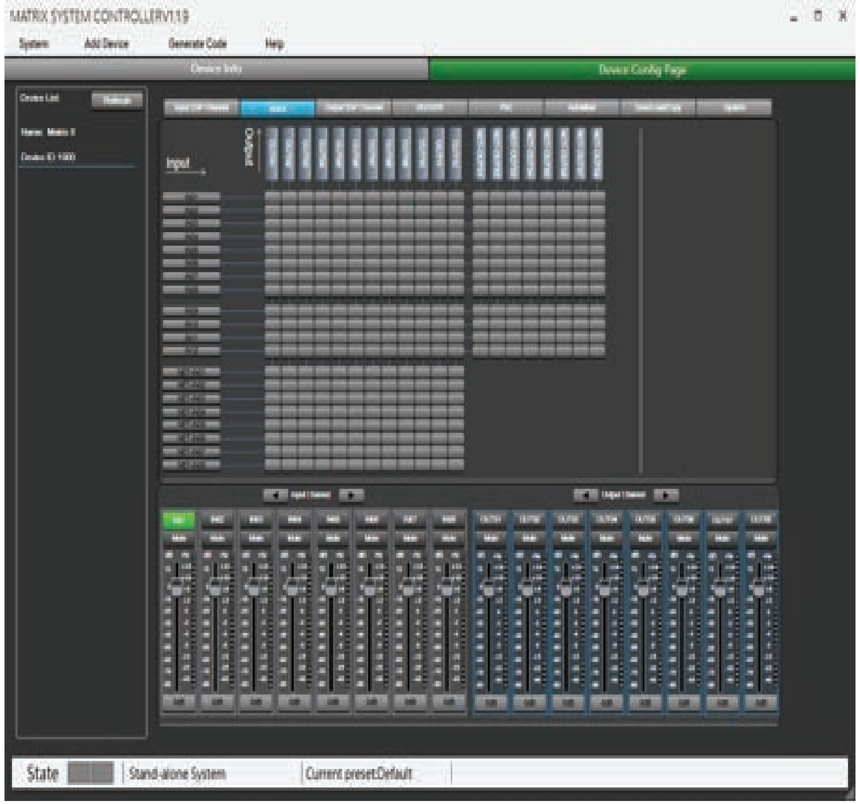
I - Dynamic Level Control

30. A LED meter is assigned to each channel to view the variation range of the input signal.

J - Gain value

31. Display and input the value of the gain.

2 – Matrix


MATRIX SYSTEM CONTROLLERV1.19
System
Add Device
Generate Code
Help
Device Info
Device Config Page
Input
Output
State
Stand-alone System
Current preset:Default

This part of the software is used to route inputs to outputs through a graphical representation as a matrix. By clicking on the gray boxes several inputs can be assigned to several outputs. If the connection is active the box turns green, otherwise it remains gray.
The matrix can route 20 input signals to 20 separate outputs. One talks about a 20 x 20 matrix.

IN (OUT) 01 to **IN (OUT) 08** are analog I/O available on the rear panel.
IN (OUT) 09 to **IN (OUT) 12** are digital I/O **(RD ports)** and are converted to analog signals in the controls panels **RVA-200** or **RIO-200** (Please refer to page 27-28).

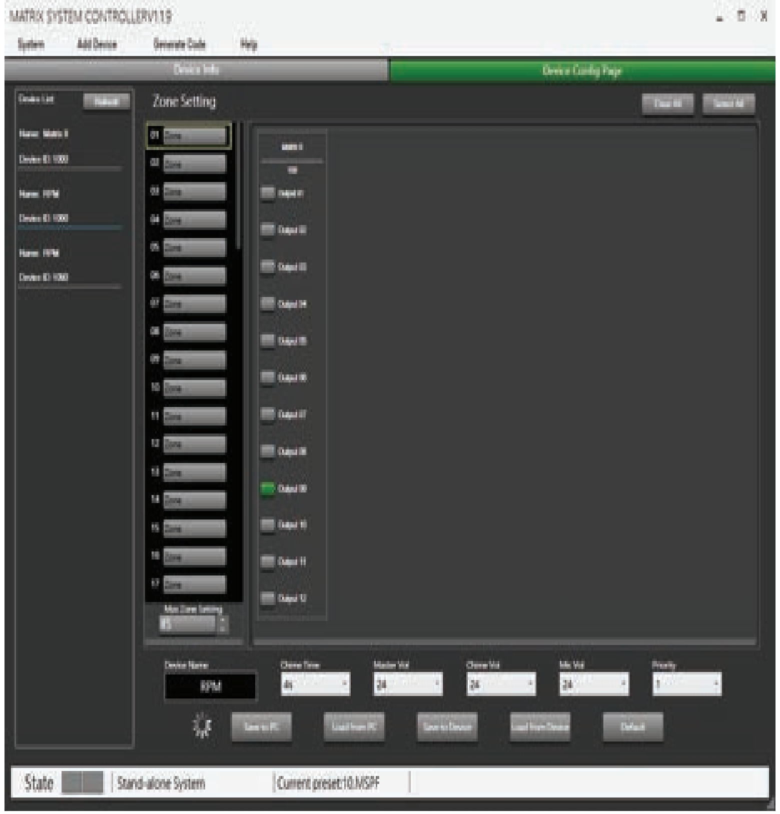
Net 01 to **Net 08** are **DANTE** digital I/O. They are selectable when using the optional DANTE card only.

g. **XLR connector**
Female 3 pin XLR connector for the gooseneck electret microphone. It uses a phantom power controlled by software.

h. **USB port**
This port is used to load MP3 files for chimes sound. The maximum time for the chimes is 4 seconds.

i. **RD port**
Connection to the MATRIX-A8. The maximum CAT 5e cable length is **100 meters**.

RPM-200 Editor (Refer to procedure page 11)

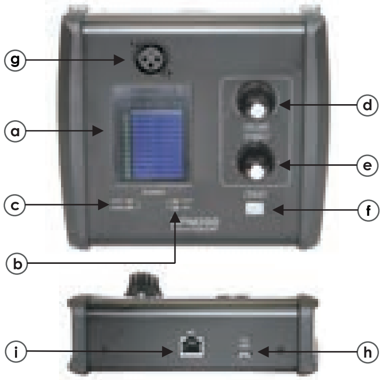

MATRIX SYSTEM CONTROLLERV1.19
System
Add Device
Generate Code
Help
Device Info
Device Config Page
Zone Setting
Clear All
Select All
Device Name
RPM
Chime Time
Master Vol
Chime Vol
Mic Vol
Priority
State
Stand-alone System
Current preset:10.MSPF

G Remote Controllers

MATRIX-A8 offers a large choice of controllers for volume adjustment, paging management, routing and I/O remotes.

1. RPM-200 Paging Station

The RPM-200 can address 1 to 32 different zones (outputs). The number of zones depends on the number of MATRIX-A8 linked together. Moreover, a total of 32 x RPM-200 can be used in a system, which makes a lot of possibilities for message paging.



a. **LCD screen**
   It displays the selected zones, the volume and ID number.

b. **Signal status indicators**
   The green LED indicates the presence of signal when the microphone is ON. The red LED indicates the limit of clipping.

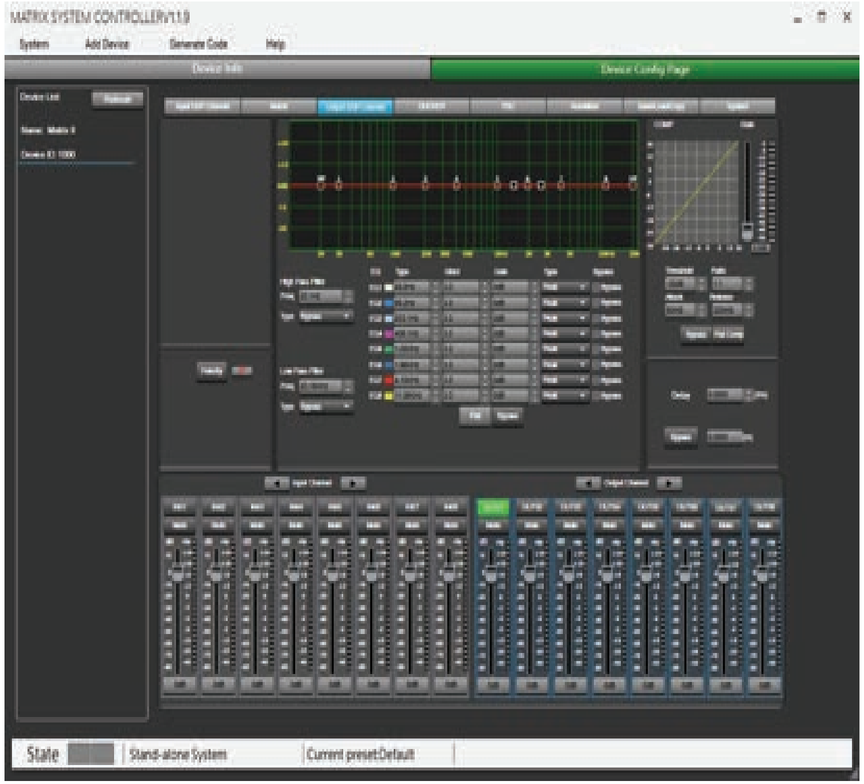
c. **Communication status indicators**
   When the communication with the MATRIX-A8 is correct, the green LED blinks.
   In case of problem, the BUSY red LED lights up.

d. **Volume control and all zone selector**
   It controls the volume of the microphone for each selected zones.
   By pushing on the button, it selects all zones.

e. **Zone selector**
   It selects one or several zones by turning the button left or right and pushing on it to validate.

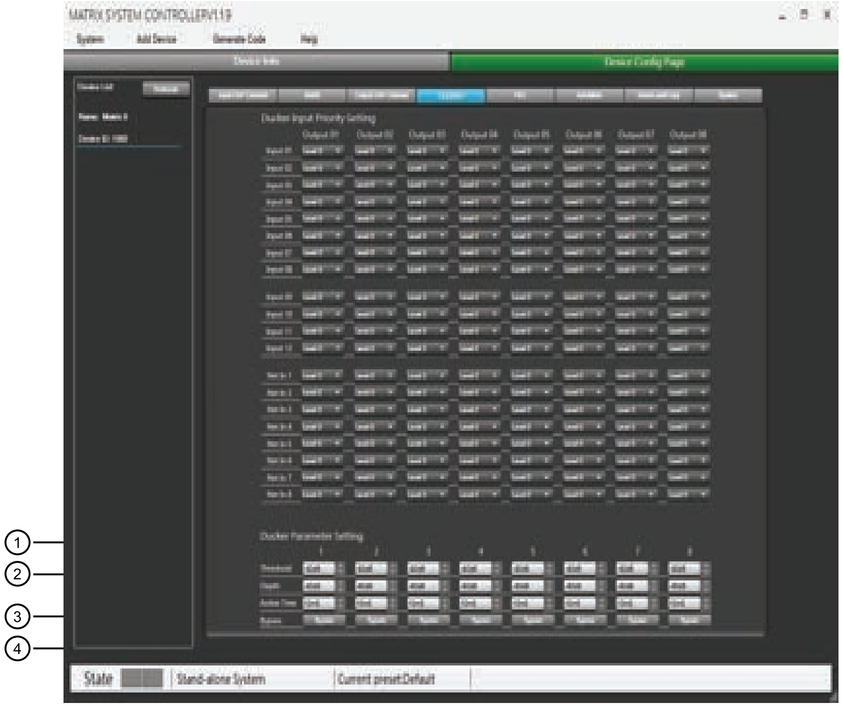
f. **Push-to-talk switch**
   When the button is pushed, the chimes sounds and the red ring on the microphone lights up indicating that one can talk.

3 - Output DSP Channel


MATRIX SYSTEM CONTROLLERV1.1.9
System
Add Device
Generate Code
Help
Device Info
Device Config Page
State
Stand-alone System
Current preset:Default

Same menu as the Input DSP Channel, without the Expander/Gate section.
The Parametric EQ features 8 bands here, instead of 5 bands for the Inputs.
Please refer to page 13.

4 – Ducker


MATRIX SYSTEM CONTROLLERV1.19
System
Add Device
Generate Code
Help
Device Info
Device Config Page
Ducker Input Priority Setting
Ducker Parameter Setting
1
2
3
4
State
Stand-alone System
Current preset:Default

The principle of the Ducker is to attenuate one or several channels when priority signals are activated. The main applications are automatic speech for conference or priority messages.

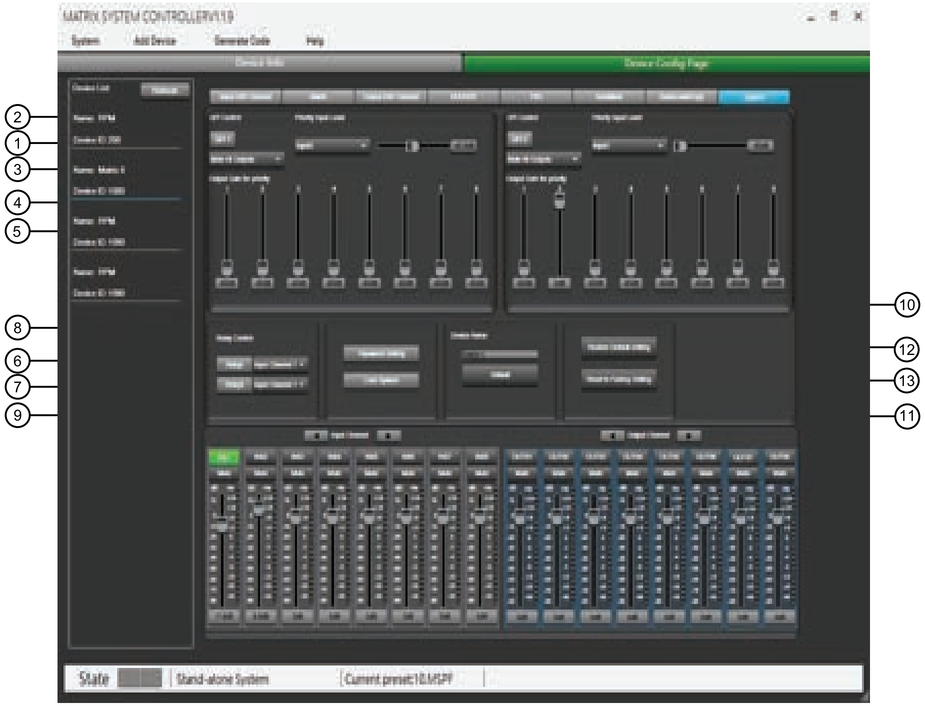
A. Ducker Input Priority Setting.
The local eight analog outputs are configured with a ducker. Eight analog inputs (1`8), four digital inputs (9`12), eight Dante inputs (Net1`8) set priority in each output with a ducker.
Priority Level: adjustable local (1`8) output (Local1`12 + Net1`8) input priority, range 0 to 15, high-level priority is preferred

B. Ducker Parameter Setting.
Each of the eight local analog outputs is equipped with a ducker. The parameters of each ducker can be adjusted separately. Each ducker does not affect each other.

1. **Threshold**: threshold of attenuation.
2. **Depth:** depth of attenuation.
3. **Active time:** The response time of the dodger, ranging from 10 to 6000 milliseconds.
4. **Bypass**: transition time between the attenuated level and return to the normal level.

---

8 - System


MATRIX SYSTEM CONTROLLERV1.19
System
Add Device
Generate Code
Help
Device Info
Device Config Page
2
1
3
4
5
8
6
7
9
10
12
13
11
State
Stand-alone System
Current preset:10.MSPF

A. General Purpose Input Control
The control signal (low level) can be connected to the two network ports in the <RC-NET> on the rear panel, and the parallel lines of the 568B standard can be used.

1. GPI: the first network port (the network port at the top), the control signal is transmitted from the white-green line, the second network port (located at the bottom of the network port), and the control signal is transmitted from the green line.

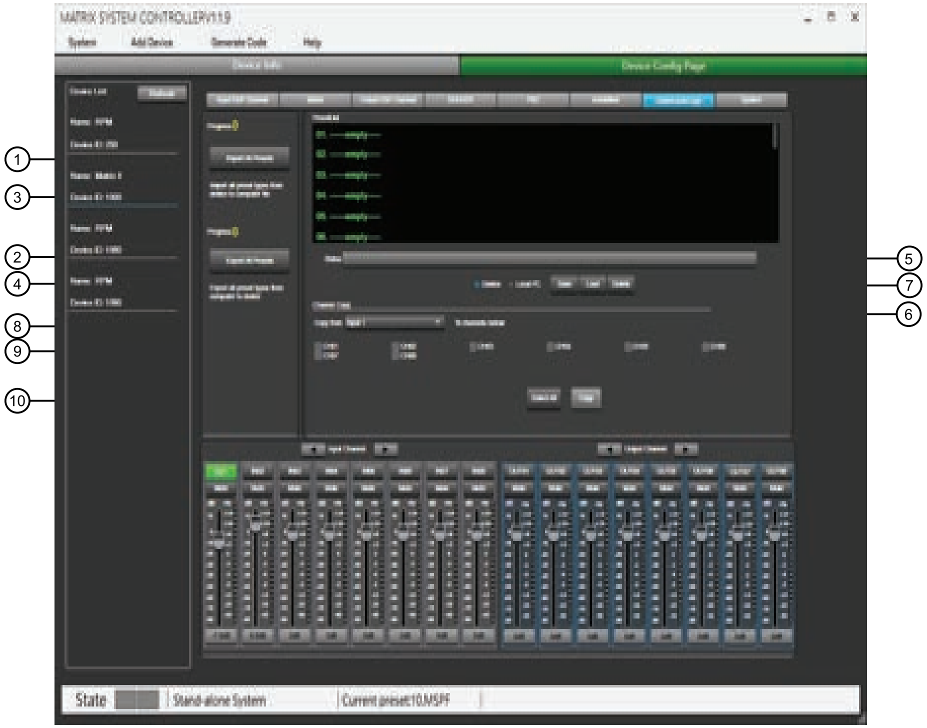
2. Priority input level: This control is the output of the selected input as the only input source to the eight outputs;

3. Mute all output: This control is muted eight outputs, port one is preferred over port two; select <Disable> to disable the port function.

4. Channel Select : You can select one of the eight local inputs as the only input source.

5. Volume: Adjustable volume of input source and eight outputs.

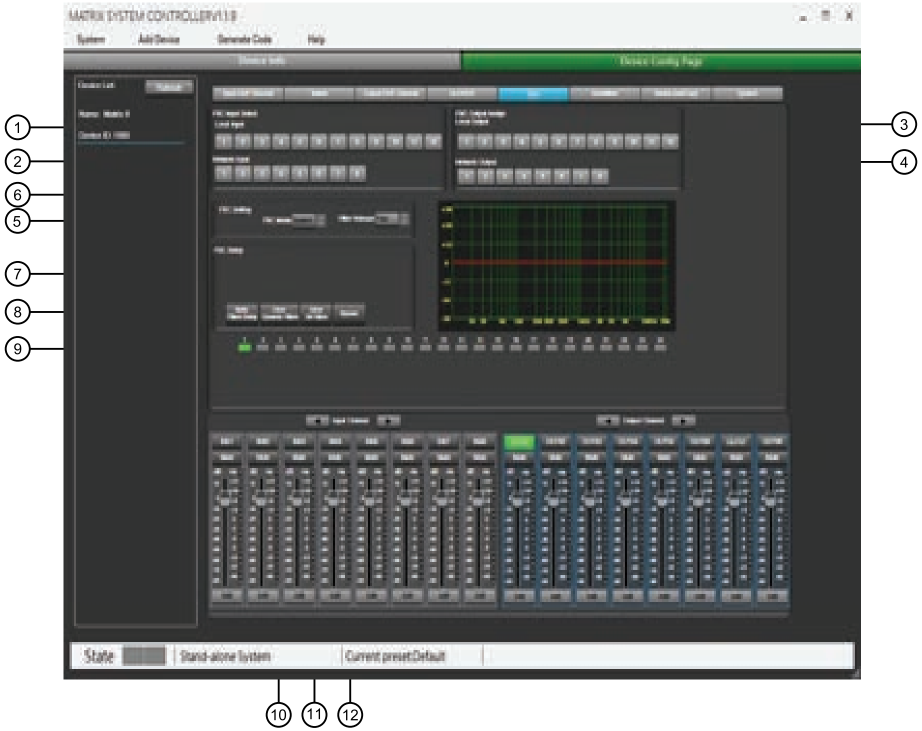
7- Save Load Copy


MATRIX SYSTEM CONTROLLERV1.1.9
System
Add Device
Generate Code
Help
Device Info
Device Config Page
1
3
2
4
8
9
10
5
7
6
State
Stand-alone System
Current preset:10.MSPF

This menu is used to manage the backup parameters of the MATRIX-A8. These data can be stored in the internal memory of the MATRIX-A8 either directly in the PC as presets.

1. **Import All Presets:** Import all presets from device to computer file.
2. **Export All Presets:** Export all presets from computer to device.
3. **Presets List:** Display 24 preset numbers and names in the device's internal memory.
4. **Device / Local PC** : click to select.
5. **Save :** save the MATRIX-A8 current data as a preset in the PC (Local PC mode).
6. **Load :** load a preset parameters from the PC into the MATRIX-A8 (Local PC mode).
5. **Save :** save in the MATRIX-A8 memory the current data as a preset (Device mode).
6. **Load :** load a preset from the MATRIX-A8 memory as a current program (Device mode).
7. **Delete**: delete a preset from the MATRIX-A8 memory (Device mode only).
8. **Copy from:** copy the settings of the inputs and outputs from one channel to another. Select e.g. Input CH01 then check the CH08 box **(9)**. Click Copy **(11)** and parameters of input 1 will be automatically copied to input 8. The procedure is identical for the outputs.
10. **Select All:** to select all channels without having to check them one by one.
11. Copy: parameter replication, bullet box confirmation operation

5 - Feedback Canceller FBC


MATRIX SYSTEM CONTROLLERV1.1.9
System
Add Device
Generate Code
Help
Device Info
Device Config Page
1
2
6
5
7
8
9
3
4
10
11
12
State
Stand-alone System
Current preset:Default

FBC or **Feedback Canceller** is a function which eliminates feedback automatically. Feedback occurs unexpectedly in a system where there are microphones and speakers nearby one of the other. This loop effect is an electro-acoustic resonance which generates an unpleasant frequency noise.

The FBC automatically detects the frequencies involved and attenuates them almost instantly using a series of selective filters.

A. **FBC Input select**
   1. **Local Input**: selection of input channels (1 to 12) to be processed.
   2. **Network Input:** selection of the DANTE input channels (1 to 8) to be processed.

B. **FBC Output Assign**
   3. **Local Output**: selection of output channels (1 to 12) where the FBC processed input is routed.
   4. **Network Output:** selection of the DANTE output channels (1 to 8) where the FBC processed input is routed.

C. FBC Setting

5. **FBC Mode :** application type, Speech or Music
6. **Filter Release :** time release of the dynamic filters after processing, Fast, Mid, Slow

D. FBC Setup

This function is used to setup the static filters:

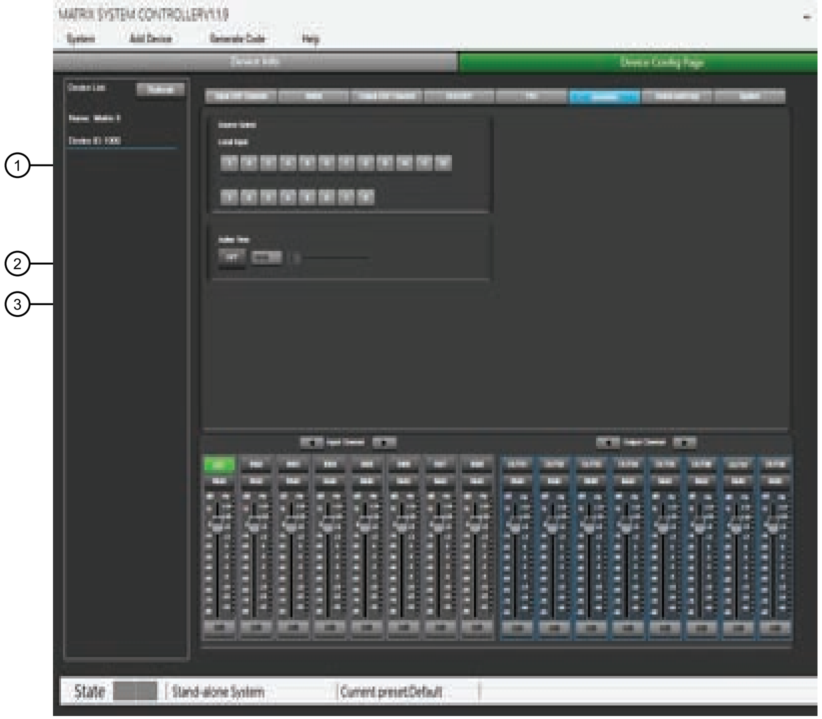
- Click **Static Filters Setup (8)**.
- Adjust the level of dedicated channels at nominal value and open microphones.
- Increase the level of the FBC using the horizontal fader **(7)** until the feedback effect appears

As soon as the system has detected the frequencies to process, the indicator boxes **(9)** 1 to 24 turns red and the filtering effect is materialized on the diagram.

For dynamic filters the attenuation also appears on the diagram and indicator boxes light up in green.

10. **Clear Dynamic Filters**: used to initialize all the dynamic filters
11. **Clear All Filters**: used to initialize all the dynamic and all static filters.
12. **Bypass**: the signal is not processed and goes directly to the next treatment module.

6 – AutoMixer



The **Automixer** automatically reduces the level of a microphone when it is not being used. Consequently it lowers the rumble, reverberation and other extraneous noise that occur when several microphones operate simultaneously.

It is typically used to mix panel discussions on television talk shows and at conferences and seminars. It can also be used to mix actors' wireless microphones in theater productions and musicals.
It is frequently employed in settings where it is expected that a live sound operator will be not present, such as courtrooms and city council chambers.

This function is often used in conjunction with the microphone priority of the **Ducker**.

A. Source select

1. **Local Input**: selection of the local input to be processed.

B. Active time

Velocity of the gain change to attenuate inputs.
Push On **(2)** to activate the time setting, and use the horizontal fader **(3)** to set the time value. the time value ranges from 10 to 6000 milliseconds.