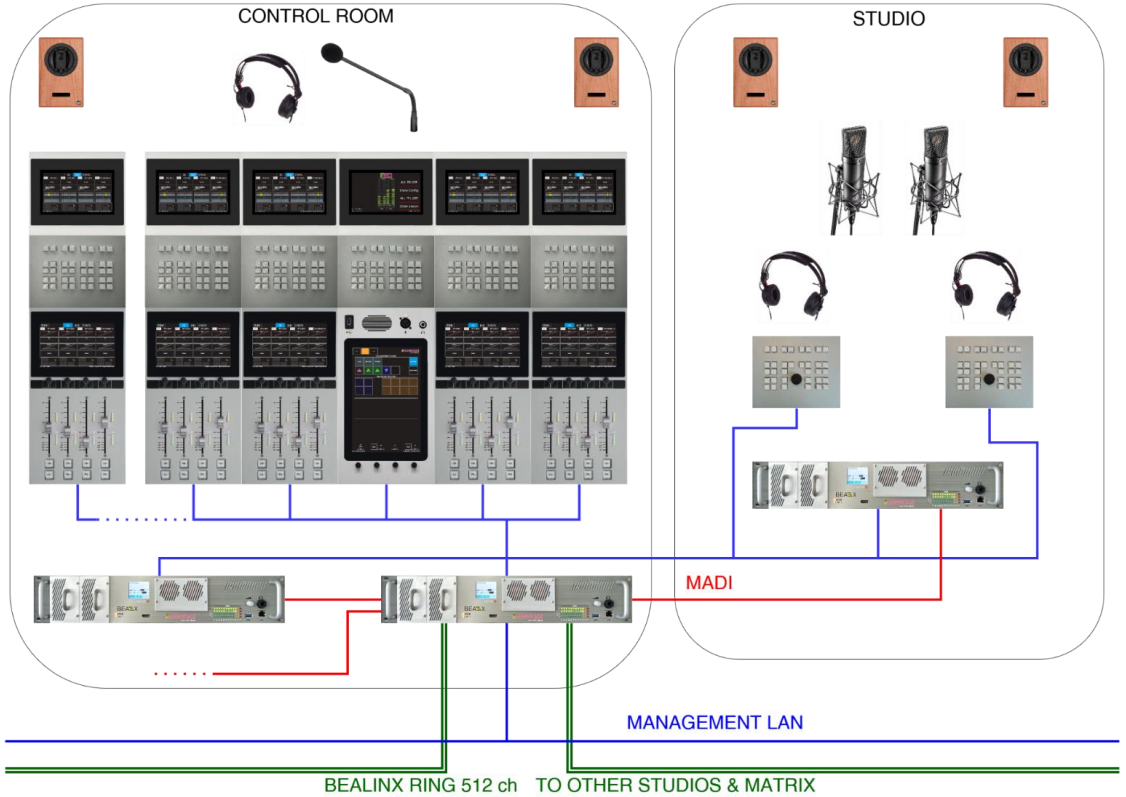
MANDOZZI
Audio Solutions

System Overview

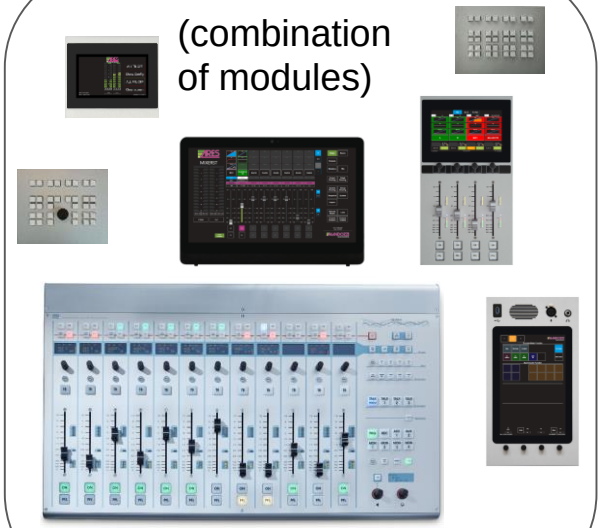
ARES MIXER EXAMPLE



General system structure 1

CONTROL SURFACE

(combination of modules)



Controls only (it is a remote control of a Bea3x)

No audio or management

audio I/O only in the ARES CENTRAL

MIXER (main Bea3x)

Local audio I/O

Local GPIO

Audio processing

Management

To add more audio I/O and GPIO

No processing, no management

optional EXTENSIONS (Bea3x used as I/O expansions)

General system structure 2

other systems needing interaction with mixer

NTP server, playout, ….

to other mixers

Management LAN

MIXER (main Bea3x)

proprietary Bealinx ring to other mixers

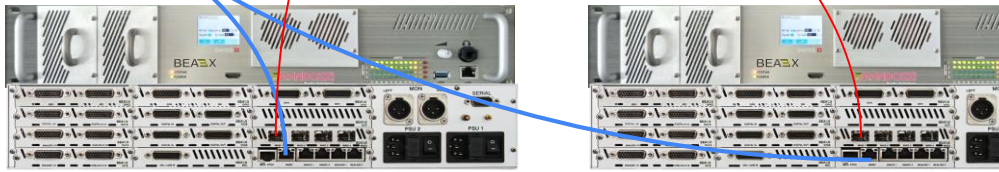
CONTROL SURFACE

(combination of modules)

Dante LAN

MADI connections to extensions

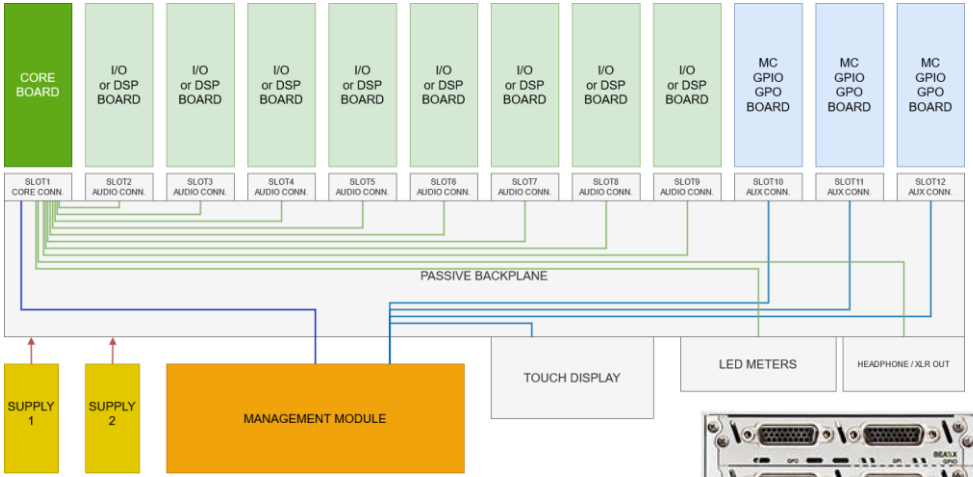
optional EXTENSIONs (Bea3x used as I/O expansions)



BEA3X equipment

Modular equipment:

same platform for Matrix, Mixer main unit and I/O expansion



1 CORE BOARD

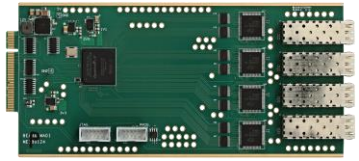
8 AUDIO SLOT

3 AUX SLOT (GPIO, MC)

BEA3X audio boards

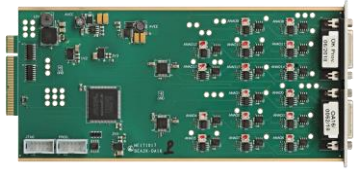
BEA3x- MADI

- up to 4 SFP for MADI I/O



BEA3x- OA16

- 16 ANALOG OUT (8 stereo)



BEA3x- IA16

- 16 ANALOG IN (8 stereo)

BEA3x- CORE

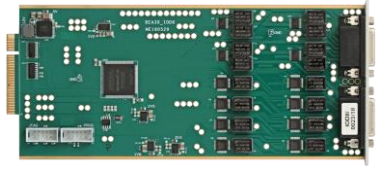
- SYNC Management
- Routing Matrix
- 64 DANTE/RAVENNA I/O (32 stereo)
- 2 x 512 BEALINX I/O

BEA3x-DANT

- up to 2 AoIP Modules
- up to 128 DANTE/RAVENNA I/O (64 stereo)

BEA3x-IOD8

- 8 AES/EBU IN (16 mono)
- 8 AES/EBU OUT (16 mono)

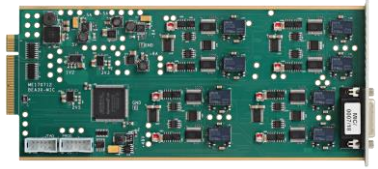


BEA3x- DSP

- 48 PROCESSING CHAINS
- 64 BUSes
- 128 MON & TB BUSes
- High Resolution Meters
- Sinus & Noise generators

BEA3x- MIC

- 8 MIC IN

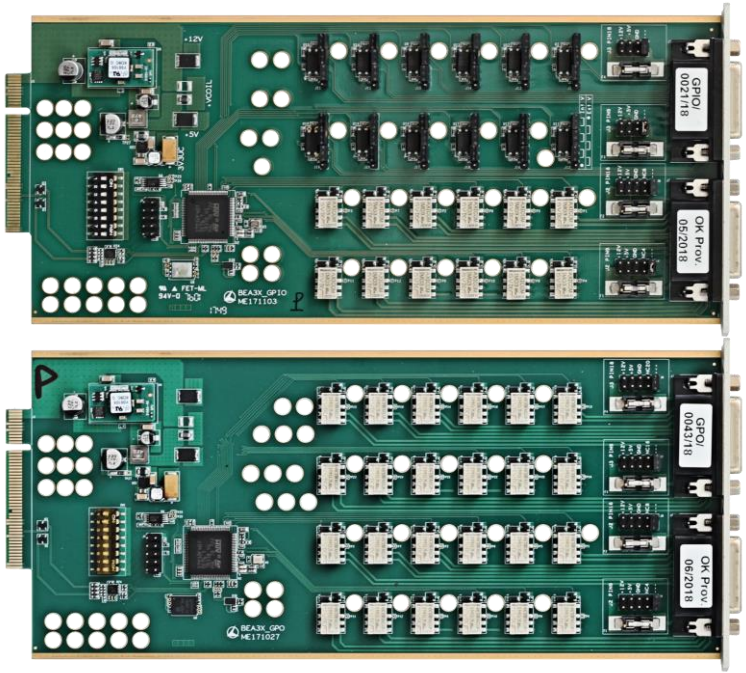


BEA3x- OD16

- 16 AES/EBU OUT (32 mono)

BEA3X aux boards

GPIO
- 12 insulated GPI
- 12 clean contact GPO



each GPI can accept an external voltage or be self-biased to read an external clean contact

GPO
- 24 clean contact GPO

MC
- 2 BEALINX Media Converter (Copper - Fiber)

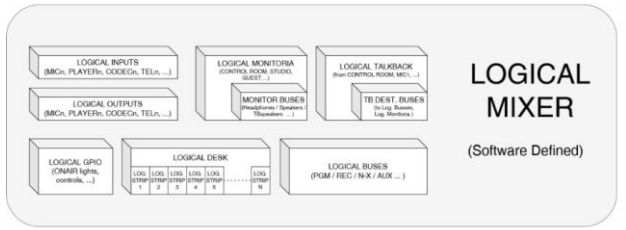
Ares software

HARDWARE
+
SOFTWARE
(Windows
based GUI)

Python scripts can run both on the BEA3X and on external devices

SOFTWARE
(Linux based)

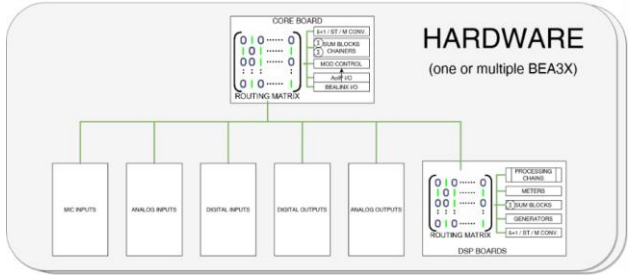
Running in the
BEA3X BRAIN board
processor



BEA3X SOFTWARE LEVEL

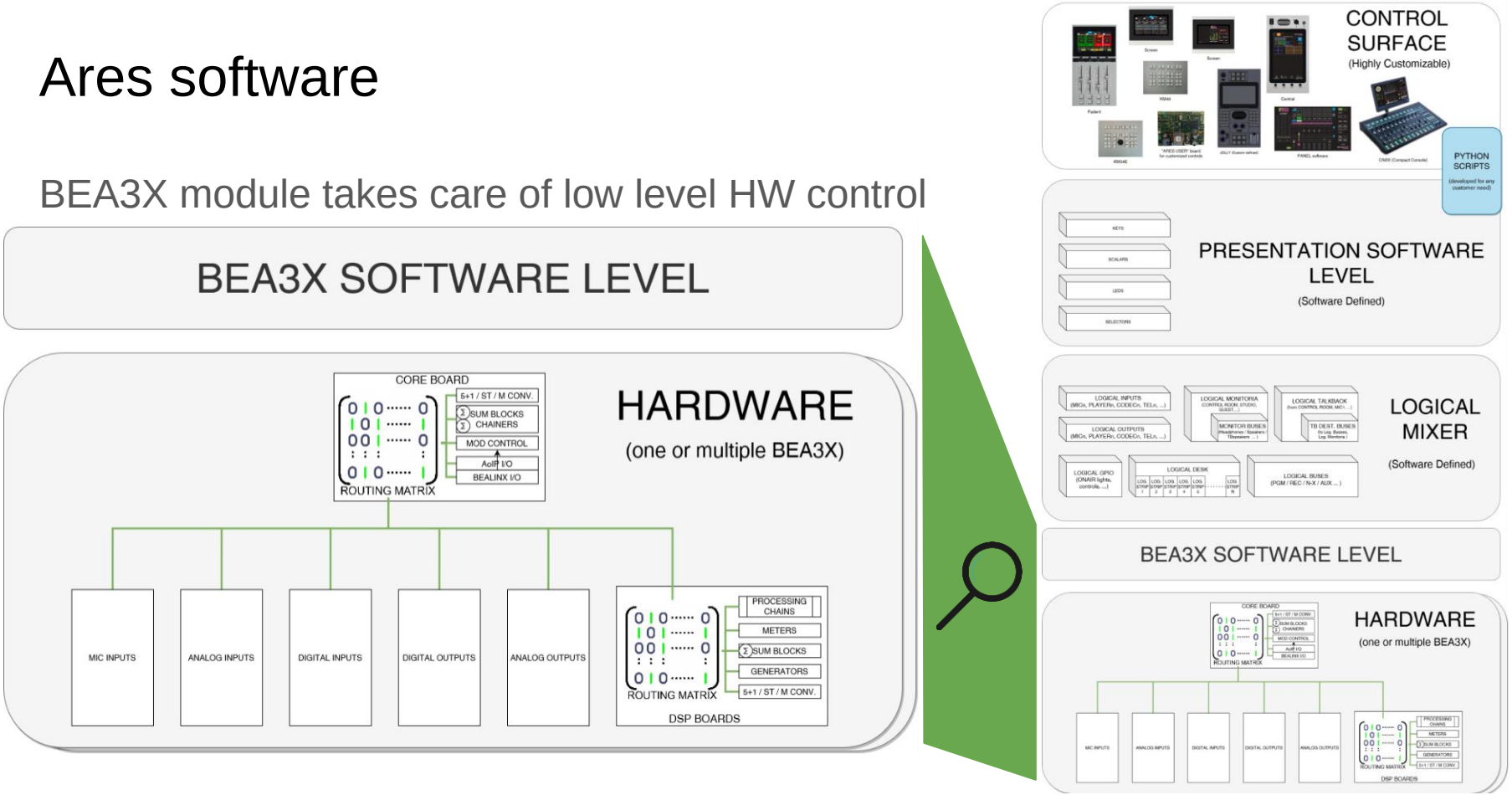
HARDWARE

BEA3X
CORE and slots



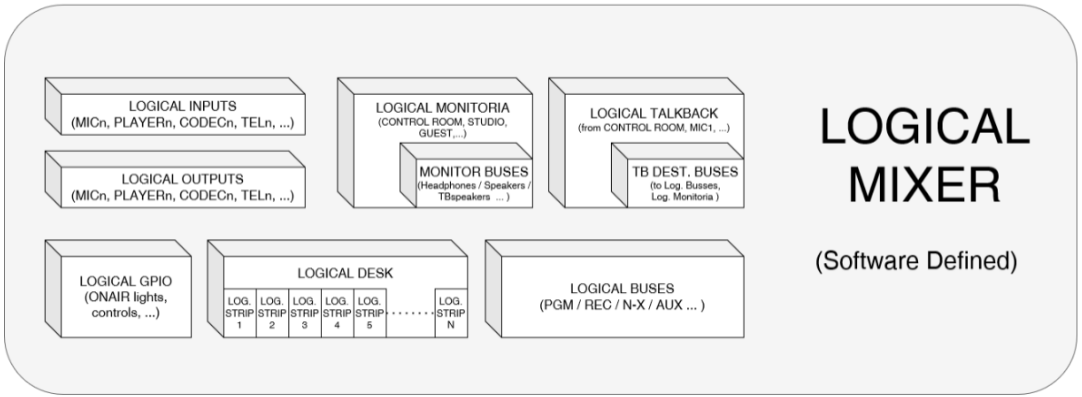
Ares software

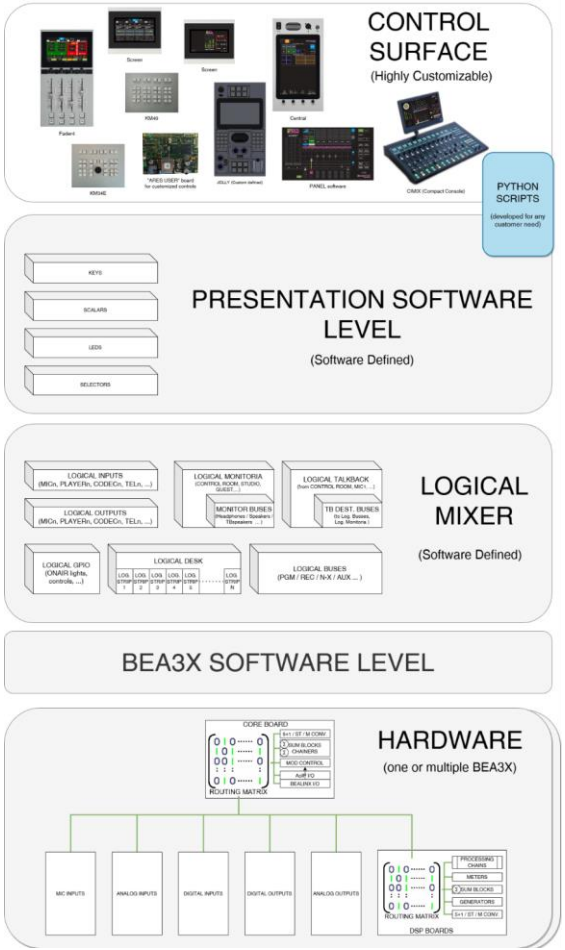
BEA3X module takes care of low level HW control



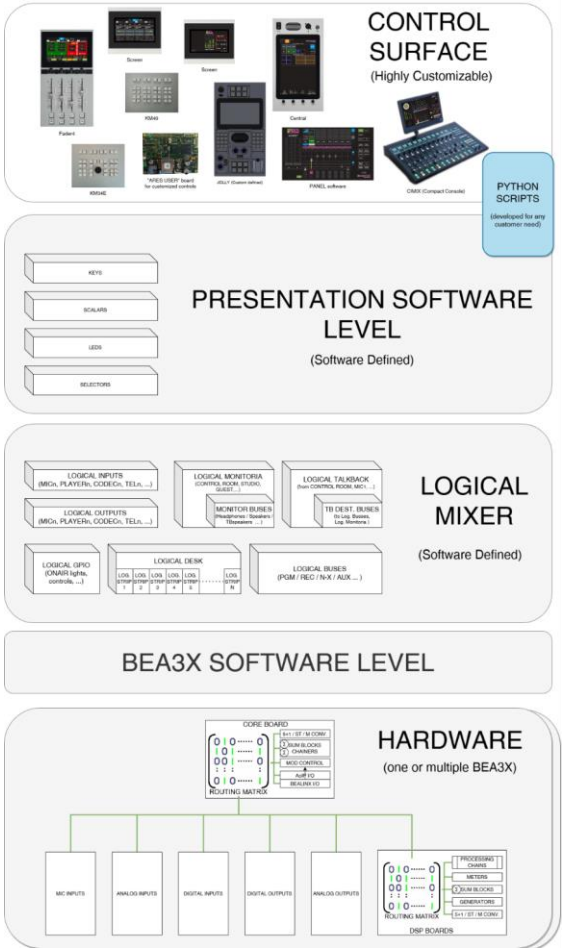
Ares software

Mixer structure user defined for each machine with dedicated configuration software





Ares software structure



Logical Mixer available blocks:

- Logical Inputs
- Processing chains
- Summing Buses
- Logical Monitoria
  - Logical Monitor Buses
- Talkback Buses
- Logical Outputs

Logical input is the “input” that can be loaded on the fader

it carries inside:

- name (and short name and user label)
- physical input(s) to use (2 sets: primary and secondary)
- processing chain settings
- assignment to buses settings
- …

Multiple logical inputs can use the same physical

Type	Channel Type	Name	Readable Name	Short Name	User Label	N-X	Extension	Physical Objects
DANTE In	Stereo	MIXER-MAIN_LOIN_LIN_40	Dante In 051/052	DTIN051/052				[DanteIn_Ch_51][DanteIn_Ch_52]
DANTE In	Stereo	MIXER-MAIN_LOIN_LIN_41	Dante In 053/054	DTIN053/054				[DanteIn_Ch_53][DanteIn_Ch_54]
DANTE In	Stereo	MIXER-MAIN_LOIN_LIN_42	Dante In 055/056	DTIN055/056				[DanteIn_Ch_55][DanteIn_Ch_56]
DANTE In	Stereo	MIXER-MAIN_LOIN_LIN_43	Dante In 057/058	DTIN057/058				[DanteIn_Ch_57][DanteIn_Ch_58]
DANTE In	Stereo	MIXER-MAIN_LOIN_LIN_44	Dante In 059/060	DTIN059/060				[DanteIn_Ch_59][DanteIn_Ch_60]
DANTE In	Stereo	MIXER-MAIN_LOIN_LIN_45	Dante In 061/062	DTIN061/062				[DanteIn_Ch_61][DanteIn_Ch_62]
DANTE In	Mono	MIXER-MAIN_LOIN_LIN_46	Dante In 063	DTIN063				[DanteIn_Ch_63]
DANTE In	Mono	MIXER-MAIN_LOIN_LIN_47	MIC CR	MIC CR				[DanteIn_Ch_64]
AES In	Stereo	MIXER-MAIN_LOIN_LIN_48	AES In 001/002	AESIN01/02				[Slot 2 - AesIn_Ch01][Slot 2 - AesI
AES In	Stereo	MIXER-MAIN_LOIN_LIN_49	AES In 003/004	AESIN03/04				[Slot 2 - AesIn_Ch03][Slot 2 - AesI
Line In	Stereo	MIXER-MAIN_LOIN_LIN_5	Analog In 009/010	ANIN009/010				[Slot 6 - LineIn_Ch09][Slot 6 - Line
AES In	Stereo	MIXER-MAIN_LOIN_LIN_50	AES In 005/006	AESIN05/06				[Slot 2 - AesIn_Ch05][Slot 2 - AesI
AES In	Stereo	MIXER-MAIN_LOIN_LIN_51	AES In 007/008	AESIN07/08				[Slot 2 - AesIn_Ch07][Slot 2 - AesI
AES In	Stereo	MIXER-MAIN_LOIN_LIN_52	AES In 009/010	AESIN09/10		N-X1		[Slot 2 - AesIn_Ch09][Slot 2 - AesI
AES In	Stereo	MIXER-MAIN_LOIN_LIN_53	AES In 011/012	AESIN11/12				[Slot 2 - AesIn_Ch11][Slot 2 - AesI
AES In	Stereo	MIXER-MAIN_LOIN_LIN_54	AES In 013/014	AESIN13/14				[Slot 2 - AesIn_Ch13][Slot 2 - AesI
AES In	Stereo	MIXER-MAIN_LOIN_LIN_55	AES In 015/016	AESIN15/16				
AES In	Stereo	MIXER-MAIN_LOIN_LIN_56	EXT AES1/2	E D1/2	PLAYER		Ext1	Extension [Ext1]
AES In	Stereo	MIXER-MAIN_LOIN_LIN_57	EXT AES3/4	EXT AES3/4			Ext1	Extension [Ext1]
Line In	Stereo	MIXER-MAIN_LOIN_LIN_58	EXT AES5/6	EXT AES5/6			Ext1	Extension [Ext1]
Line In	Stereo	MIXER-MAIN_LOIN_LIN_59	AES 7/8 EXT	AES 7/8 EXT				[Slot 6 - LineIn_Ch07][Slot 6 - Line
Line In	Stereo	MIXER-MAIN_LOIN_LIN_6	Analog In 011/012	ANIN011/012				[Slot 6 - LineIn_Ch11][Slot 6 - Line
Mic/Line In	Mono	MIXER-MAIN_LOIN_LIN_60	MIC1 bis	MIC1 bis				[Slot 3 - Mic_01]
AES In	Mono	MIXER-MAIN_LOIN_LIN_62	AES 7	AES 7				[Slot 2 - AesIn_Ch07]
Line In	Stereo	MIXER-MAIN_LOIN_LIN_63	EXT AES 9/10	EXT AES 9/10			Ext1	Extension [Ext1]

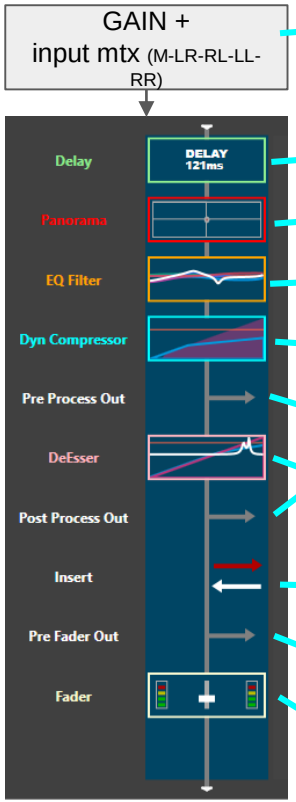
to select the input to load on the desk the logical input list will be browsed with a customized categories tree

Logical Mixer available blocks:

- Logical Inputs
- Processing chains
- Summing Buses
- Logical Monitoria
  - Logical Monitor Buses
- Talkback Buses
- Logical Outputs

block presence and order is customizable for each logical input

the DSP will be configured correctly each time an input is loaded on the desk



Fixed position for digital gain and input matrix (Mono, Stereo, Stereo inversion, Left only

Delay

Stereo image settings

Equalizer 6 bands parametric

Dynamic processor (Expander/Gate + Compressor + Limiter)

Output points for partially processed output

Deesser

Insert send&return

Output point to create “PreFader” Buses

Fader with pre-fader and post-fader meters

Logical Mixer available blocks:

- Logical Inputs
- Processing chains
- Summing Buses
- Logical Monitoria
  - Logical Monitor Buses
- Talkback Buses
- Logical Outputs

A DSP board can generate 64 busses,
for each one the type can be defined as:

- PGM
- REC
- PFL
- N-X (“mix-minus”)
- AUX
- GROUP

For each type any number of bus is available

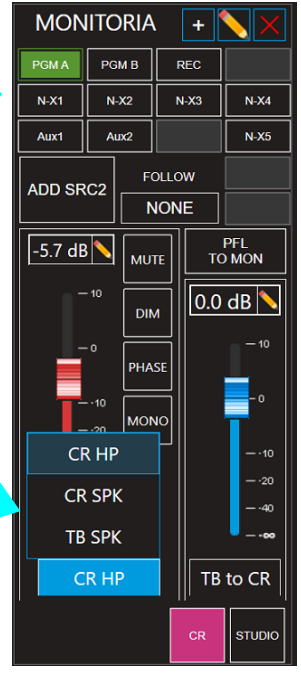
“VCA” and “INPUT GROUPs” are also available

Logical Mixer available blocks:

- Logical Inputs
- Processing chains
- Summing Buses
- Logical Monitoria
  - Logical Monitor Buses
- Talkback Buses
- Logical Outputs

A Logical Monitoria is a monitoring system composed by:

- signal selection (up to 16 user assignable sources from which is possible to pick a primary and a secondary source)
- association with PFL bus
- association with Talkback bus
- many Monitor Buses



Each Monitor Bus can be configured to act in a proper way on:

- signal selection
- PFL active
- incoming TB
- specified inputs are onair
- outgoing TB

and it is possible to modify the PFL behaviour with a dedicated key (to split or swap buses)

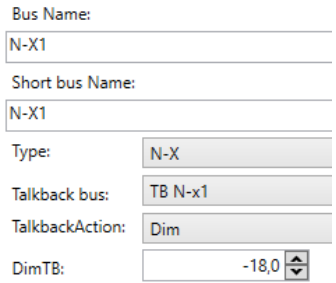
Logical Mixer available blocks:

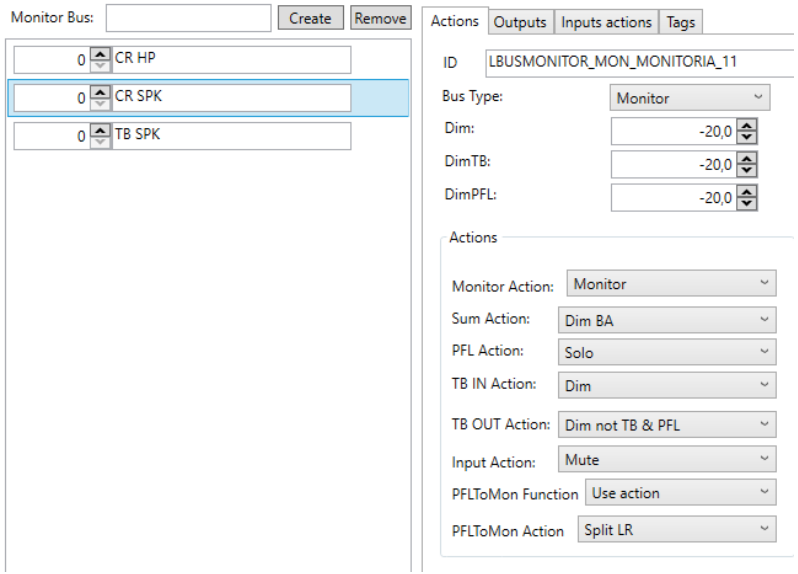
- Logical Inputs
- Processing chains
- Summing Buses
- Logical Monitoria
  - Logical Monitor Buses
- Talkback Buses
- Logical Outputs

A talkback bus can be created and added to logical buses and logical monitoria to enable them to receive talkbacks

Each talkback destination must have an associated talkback bus

The action to be done when receiving the talkback is configurable.





Logical Mixer available blocks:

- Logical Inputs
- Processing chains
- Summing Buses
- Logical Monitoria
- Logical Monitor Buses
- Talkback Buses
- Logical Outputs

A Logical Output is the “output” where you can connect a signal to have it physically available outside the Bea3x

It defines the association between logical and physical

Type	Channel Type	Name	Readable Name	Short Name	Extension	Physical Objects
DANTE Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_37	Dante 053/054	DT053/054		[DanteOut_Ch_53][DanteOut_Ch_54]
DANTE Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_38	Dante 055/056	DT055/056		[DanteOut_Ch_55][DanteOut_Ch_56]
DANTE Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_39	Dante 057/058	DT057/058		[DanteOut_Ch_57][DanteOut_Ch_58]
Line Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_4	Analog 003/004	AN003/004		[Slot 5 - LineOut_Ch03][Slot 5 - LineOut_Ch04]
DANTE Out	Mono	MIXER-MAIN_LOGOUT_LOUT_40	Dante 059	DT059		[DanteOut_Ch_59]
DANTE Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_41	Dante CR SPEAKERS	CR LSP		[DanteOut_Ch_60][DanteOut_Ch_61]
DANTE Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_42	Dante CR HEADPHONES	CR HP		[DanteOut_Ch_62][DanteOut_Ch_63]
DANTE Out	Mono	MIXER-MAIN_LOGOUT_LOUT_43	Dante TB LSP	Dante TB LSP		[DanteOut_Ch_64]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_44	AES 001/002	AES01/02		[Slot 2 - AesOut_Ch01][Slot 2 - AesOut_Ch02]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_45	AES 003/004	AES03/04		[Slot 2 - AesOut_Ch03][Slot 2 - AesOut_Ch04]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_46	AES 005/006	AES05/06		[Slot 2 - AesOut_Ch05][Slot 2 - AesOut_Ch06]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_47	AES 007/008	AES07/08		[Slot 2 - AesOut_Ch07][Slot 2 - AesOut_Ch08]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_48	AES 009/010	AES09/10		[Slot 2 - AesOut_Ch09][Slot 2 - AesOut_Ch10]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_49	AES 011/012	AES11/12		[Slot 2 - AesOut_Ch11][Slot 2 - AesOut_Ch12]
Line Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_5	Analog 005/006	AN005/006		[Slot 5 - LineOut_Ch05][Slot 5 - LineOut_Ch06]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_50	AES 013/015	AES13/15		[Slot 2 - AesOut_Ch13][Slot 2 - AesOut_Ch15]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_51	AES 014/016	AES14/16		[Slot 2 - AesOut_Ch14][Slot 2 - AesOut_Ch16]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_52	EXT AES 01/02	EXT AES 01/02	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_53	EXT AES 03/04	EXT AES 03/04	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_54	EXT AES 05/06	EXT AES 05/06	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_55	EXT AES 07/08	EXT AES 07/08	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_56	EXT AES 09/10	EXT AES 09/10	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_57	EXT AES 11/12	EXT AES 11/12	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_58	EXT AES 13/14	EXT AES 13/14	Ext1	Extension [Ext1]
AES Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_59	EXT AES 15/16	EXT AES 15/16	Ext1	Extension [Ext1]
Line Out	Stereo	MIXER-MAIN_LOGOUT_LOUT_6	Analog 007/008	AN007/008		[Slot 5 - LineOut_Ch07][Slot 5 - LineOut_Ch08]

Better not to have different logical outputs with same physical to avoid conflicts

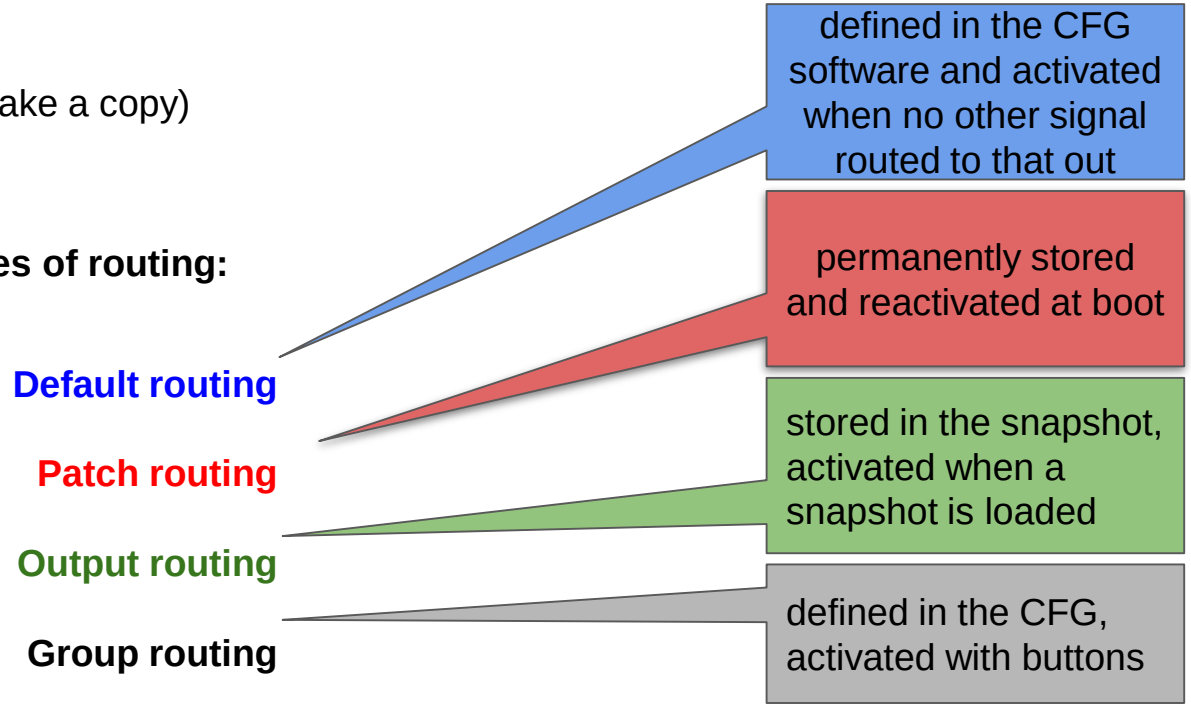
Many types of logical signal assignment (routing) are possible

Ares routing

Anything can be routed to a Logical Out:

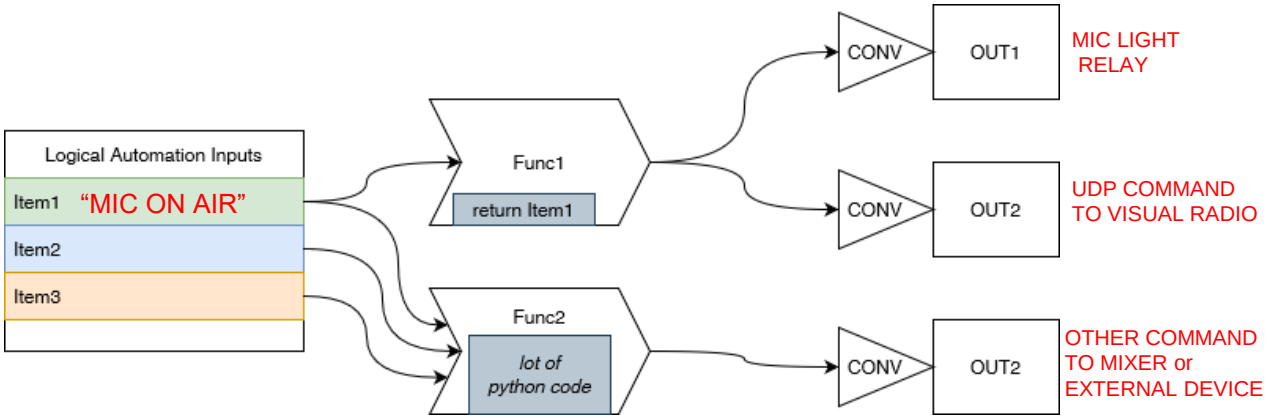
- input
- buses
- monitor buses
- output (it will make a copy)

Different types of routing:



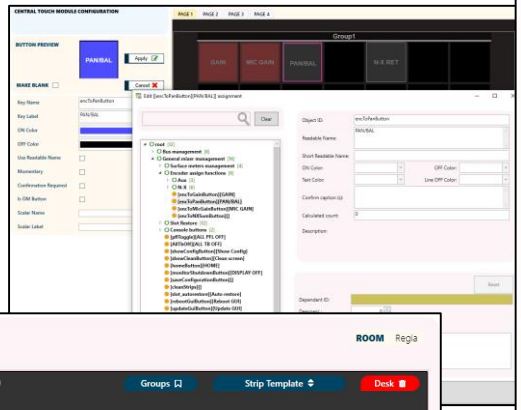
Not audio only: Logical automation module

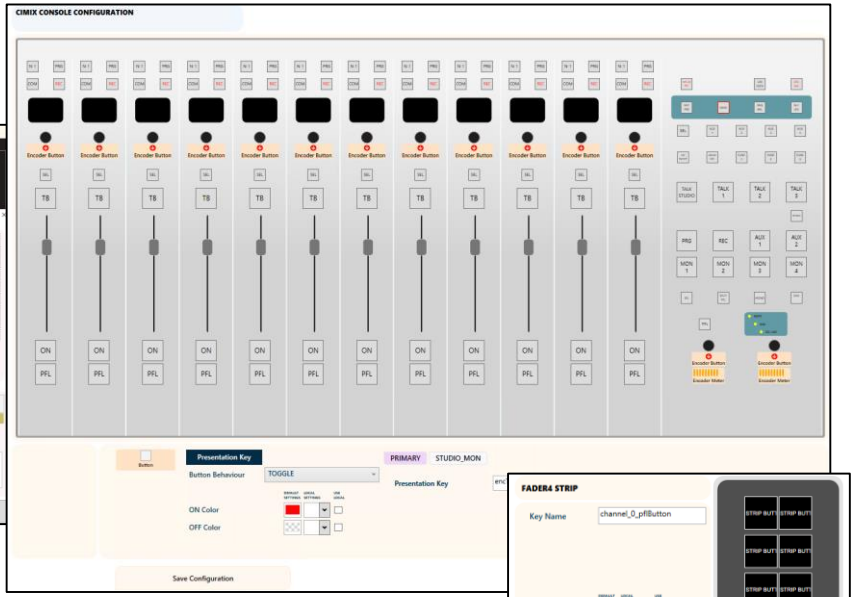
- User defined automation inputs (Opto in, logical input status, mixer status, buttons, scalars, leds, incoming network messages, ….)
- User defined functions (python code based, with automatic generation for simple boolean operations)
- User defined outputs (relay, operations on presentation controls, network messages send, …) with optional Converters to adjust data type

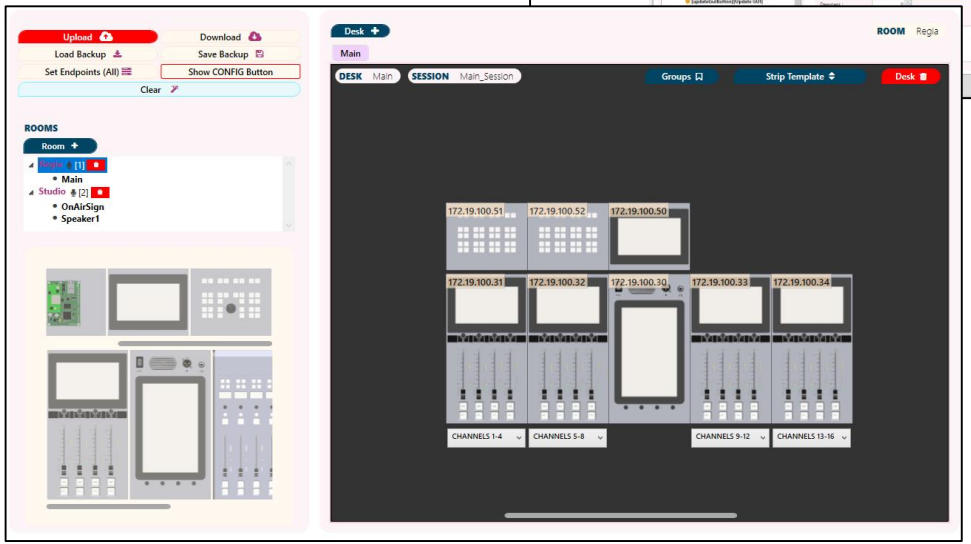


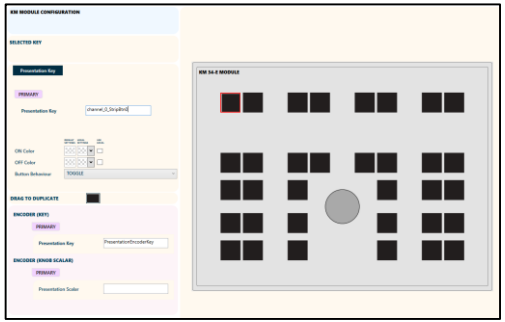
Fully customizable surface

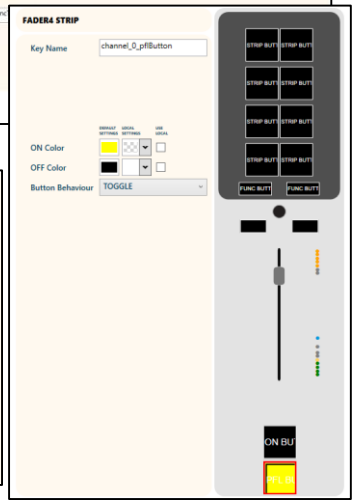
with dedicated GUI to set the association between physical controls and “presentation objects”, colors and all parameters



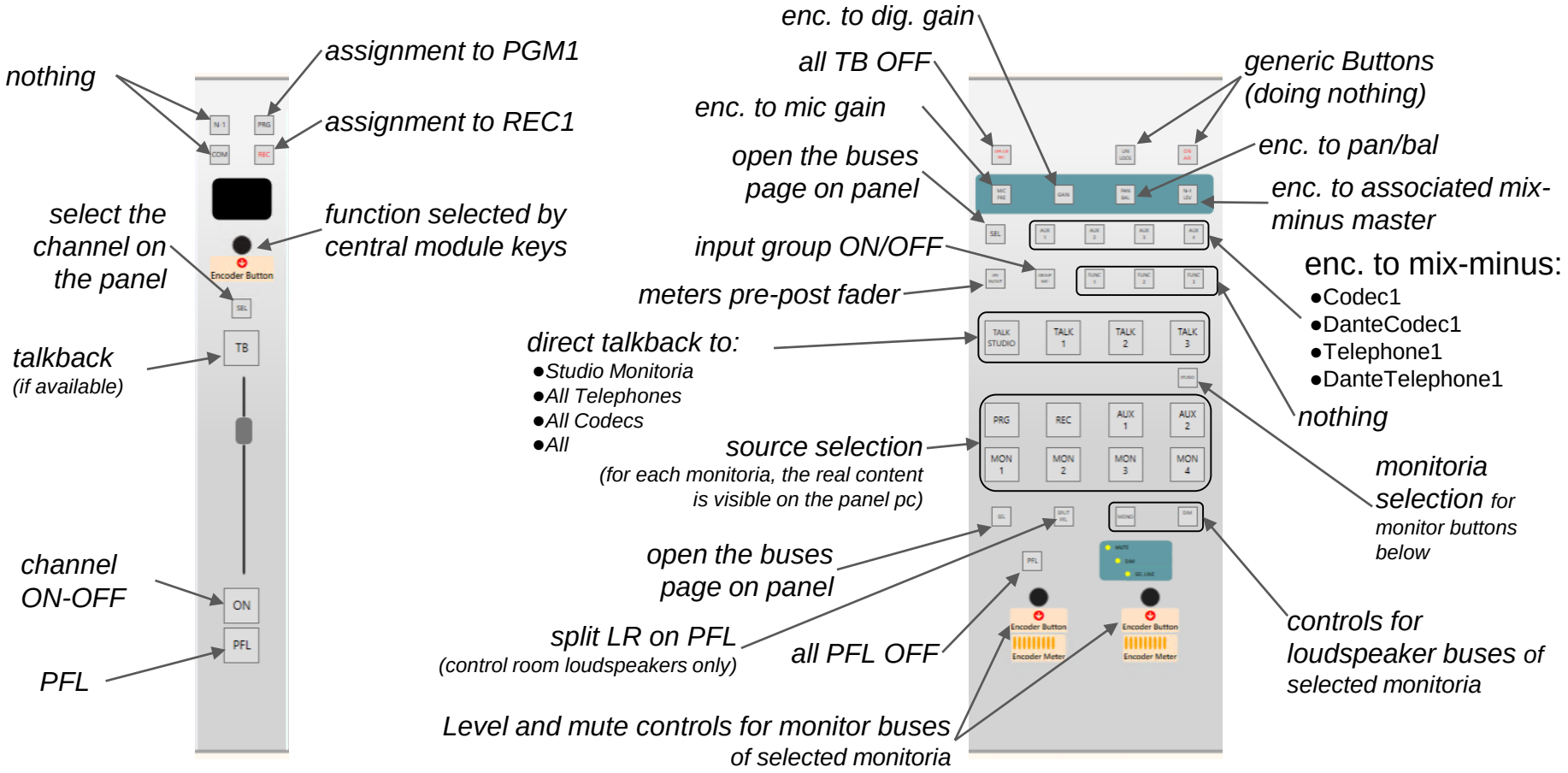








Fully customizable surface: example



advanced PYTHON interaction

In addition to Automation module, special python scripts can be written and can be used to add new functions if required

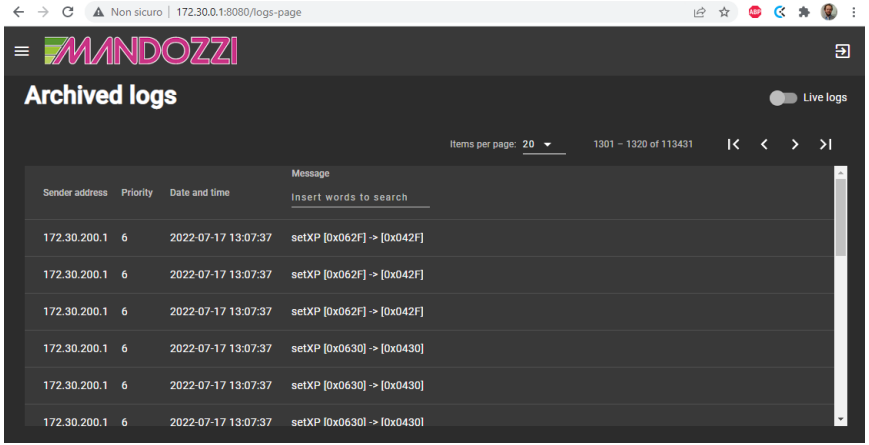
Everything can be accessed with Python both from inside the Bea3x or from external devices

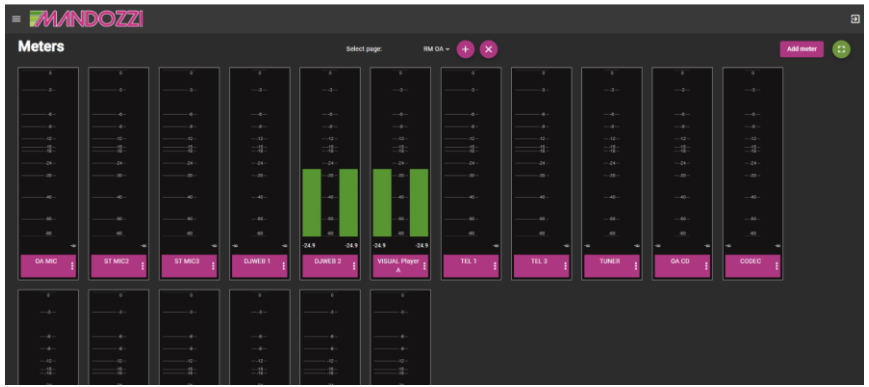
```
TB_MIC2_STUDIO_Btn = presentation.getKeyByName("TALKBACK::LOGICALTALKBACKMANAGER_TBG_TB_8_TB_TALK_5")

def Spk2Studio(status):
    global numBottoniPremuti
    if status==ARC.KeyStatus.PRESSED:
        print("Activate TB_MIC2_STUDIO_Btn")
        numBottoniPremuti = numBottoniPremuti+1
        TB_MIC2_STUDIO_Btn.setKeyStatus(ARC.KeyStatus.PRESSED)
        ALLOFF_Btn.setKeyStatus(ARC.KeyStatus.PRESSED)
    else:
        print("Deactivate TB_MIC2_STUDIO_Btn")
        TB_MIC2_STUDIO_Btn.setKeyStatus(ARC.KeyStatus.UNPRESSED)
        numBottoniPremuti = numBottoniPremuti-1
        if numBottoniPremuti<=0:
            ALLOFF_Btn.setKeyStatus(ARC.KeyStatus.UNPRESSED)
Bottone62 = ArcFunctions.GenericKeyConfig(62, presentation, "TB\n\nSPK2\nSTUDIO", "#FFFFFF00", "#FFFFFFFF",  adapter,0, "", Spk2Studio)

def AllOff(status):
    global numBottoniPremuti
    print("NumeroBottoniPremuti:"+str(numBottoniPremuti))
    if status==ARC.KeyStatus.UNPRESSED:
        print("Deactivate ALL CONF")
        TB_MIC1_MI_Btn.setKeyStatus(ARC.KeyStatus.UNPRESSED)
                            .....
        TB_MIC2_STUDIO_Btn.setKeyStatus(ARC.KeyStatus.UNPRESSED)
                            ......
        Bottone39.setKeyStatus(ARC.KeyStatus.UNPRESSED)
                            .....
        Bottone63.setKeyStatus(ARC.KeyStatus.UNPRESSED)
        numBottoniPremuti=0
    else:
        print("ALL OFF PRESSED NumeroBottoniPremuti:"+str(numBottoniPremuti))
        if numBottoniPremuti==0:
            ALLOFF_Btn.setKeyStatus(ARC.KeyStatus.UNPRESSED)

ALLOFF_Btn = ArcFunctions.GenericKeyConfig(60, presentation, "ALL\nCONF\nOFF", "#FFFF0000", "#FFFFFFFF",  adapter,0, "", AllOff)
```

Centralized System Management Software

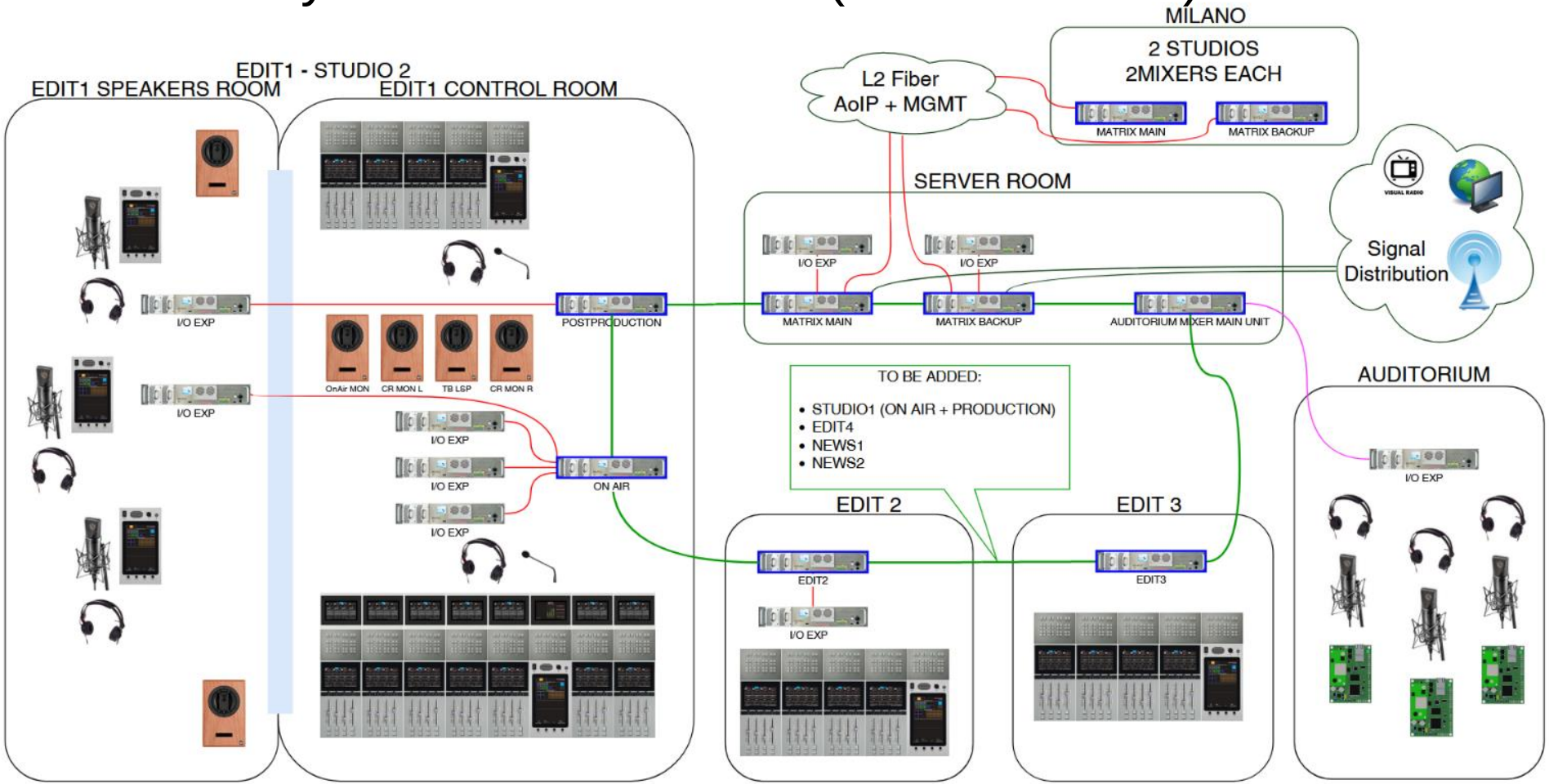
Running on an external Linux server to control a complex installation with several mixers through any web browser

- Log collection and browsing
- Machines status monitoring
- Connections monitoring
- Audio metering
- Configurations management
- Sw versions management

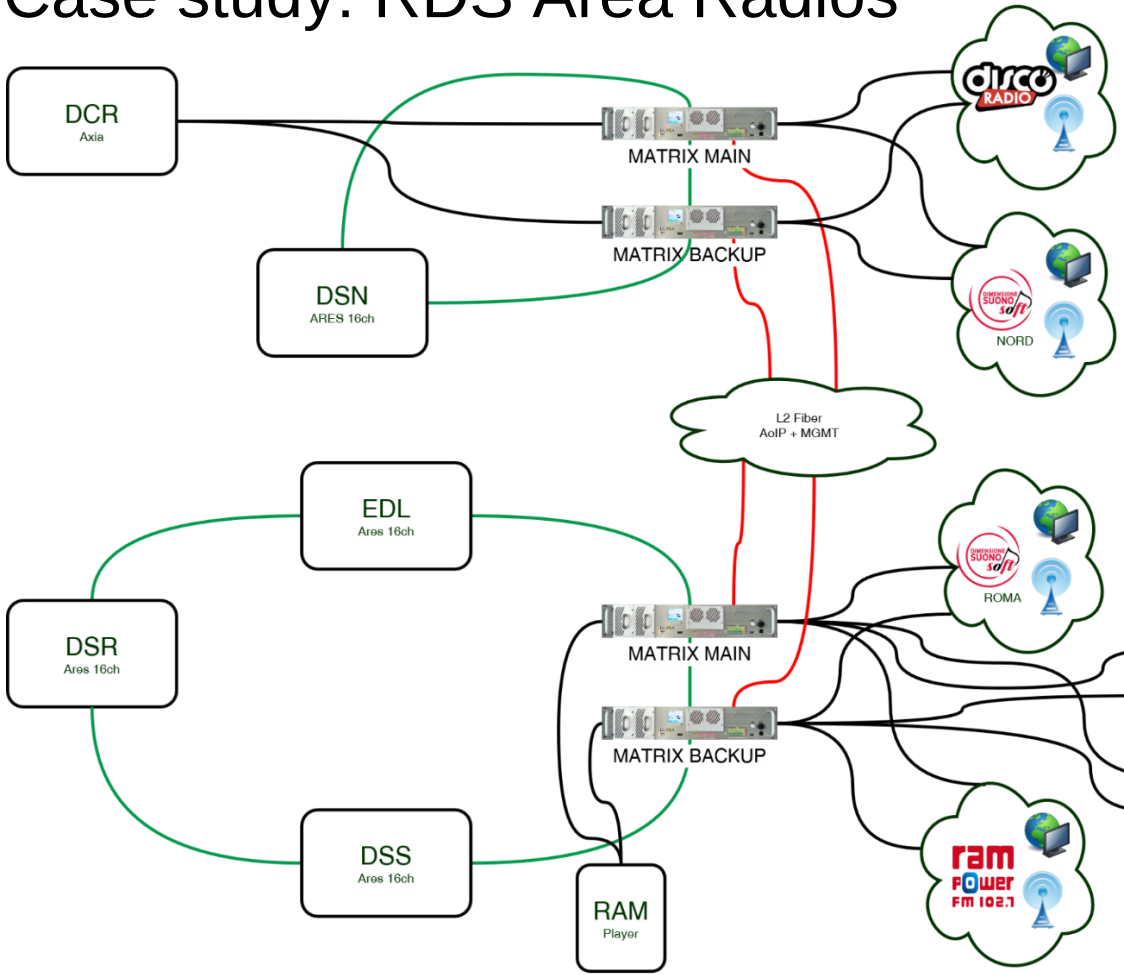




Case study: RDS main network (Rome + Milan)



Case study: RDS Area Radios

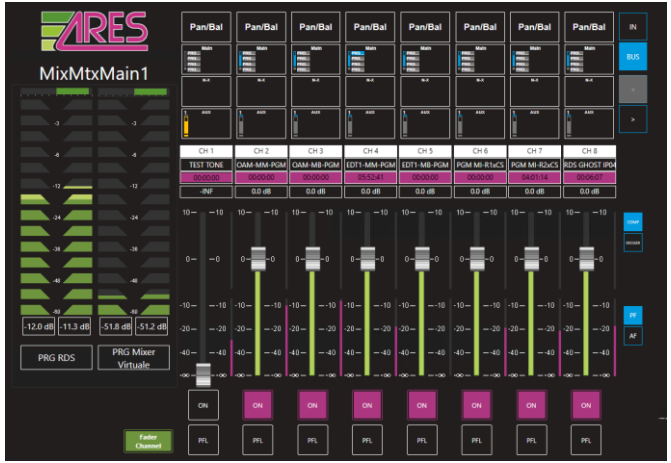


Multiple studios in 2 cities to multiple radios in different areas

Antenna Management System

Integrated in the Matrix / Mixers

with management of multiple radios and multiple studios



Matrix panel View

PC software view
(customizable)

ARES console
central panel view
(customizable)

Case Study: RDS customized services

- A dedicated service to provide data about the channels onair to the Visual Radio automation on an external server


```
2022-02-17 11:54:33,180 - MIO - INFO - Sending: '<MM02M01645095273180018T1R2    00MT>' to mandozzi.se
2022-02-17 11:54:33,947 - MIO - INFO - Sending: '<RP11M01645095273947 13MIC3     11UN>' to mandozzi.se
2022-02-17 11:54:33,987 - MIO - INFO - Sending: '<RP11M01645095273987 12MIC1     11RR>' to mandozzi.servizirds.com:44236
2022-02-17 11:54:33,993 - MIO - INFO - Sending: '<RP11M01645095273993 14MIC2     12QT>' to mandozzi.servizirds.com:44236
2022-02-17 11:54:35,708 - MIO - INFO - Sending: '<RP11M01645095275708 08A        11QP>' to mandozzi.servizirds.com:44236
2022-02-17 11:54:39,724 - MIO - INFO - Sending: '<RP11M01645095279724 15MILANO R211YM>' to mandozzi.servizirds.com:44236
2022-02-17 11:54:43,662 - MIO - INFO - Sending: '<RP11M01645095283662 08A        01JT>' to mandozzi.servizirds.com:44236
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2022-02-17 11:54:44,852 - MIO - INFO - Sending: '<RP11M01645095284852 07TACK     10UI>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:45,488 - MIO - INFO - Sending: '<RP11M01645095345 09B        11LZ>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:46,376 - MIO - INFO - Sending: '<RP11M01645095346376 14MIC2     11KU>' to mandozzi.servizirds.com:44236
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2022-02-17 11:55:47,042 - MIO - INFO - Sending: '<RP11M01645095347042 13MIC3     10DR>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:47,072 - MIO - INFO - Sending: '<RP11M01645095347072 14MIC2     10DU>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:47,438 - MIO - INFO - Sending: '<MM02M01645095347438018T1R2    00UT>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:47,478 - MIO - INFO - Sending: '<RP11M01645095347478 12MIC1     00JU>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:47,705 - MIO - INFO - Sending: '<RP11M01645095347705 13MIC3     00LN>' to mandozzi.servizirds.com:44236
2022-02-17 11:55:47,959 - MIO - INFO - Sending: '<RP11M01645095347959 14MIC2     00S8>' to mandozzi.servizirds.com:44236
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2022-02-17 11:55:48,410 - MIO - INFO - Sending: '<RP11M01645095348410 07TACK     00JJ>' to mandozzi.servizirds.com:44236
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2022-02-17 11:56:18,825 - MIO - INFO - Sending: '<RP11M01645095378825 09B        01OW>' to mandozzi.servizirds.com:44236
2022-02-17 11:56:19,811 - MIO - INFO - Sending: '<RP11M01645095379811 08A        12KW>' to mandozzi.servizirds.com:44236
2022-02-17 11:56:20,034 - MIO - INFO - Sending: '<RP11M01645095380034 10C        01XO>' to mandozzi.servizirds.com:44236
```
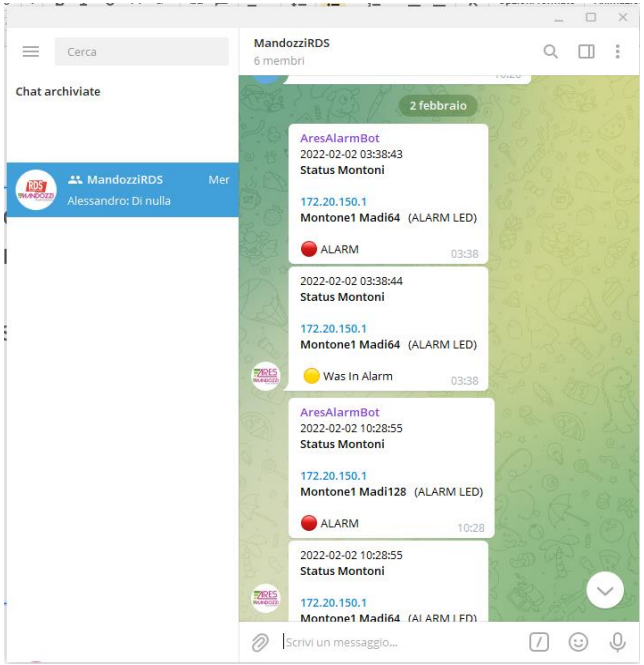
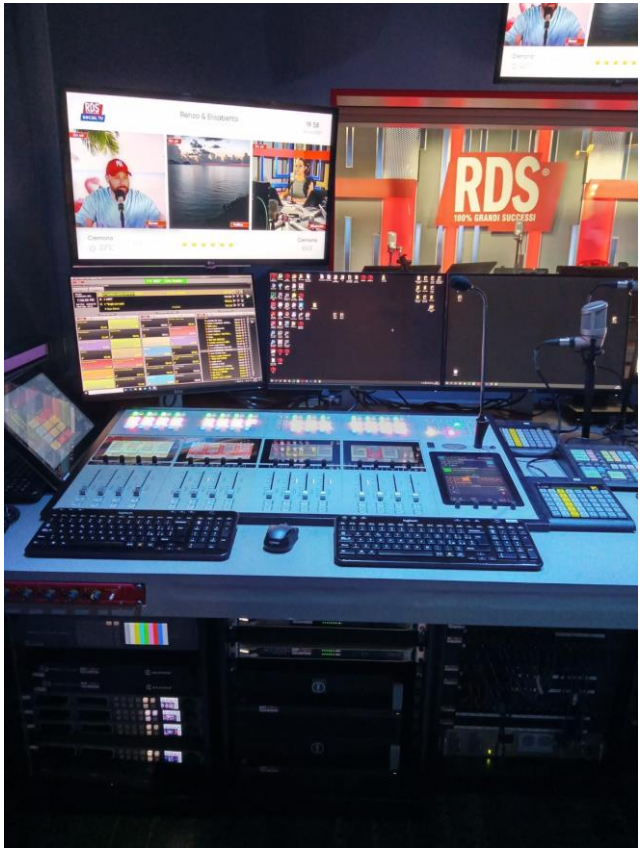

- Telegram notifications about system status



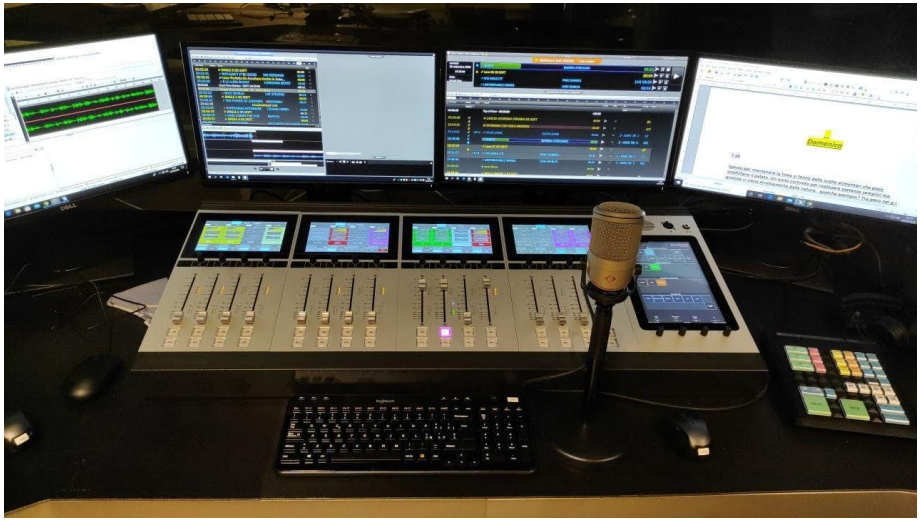
RDS Studio Edit1



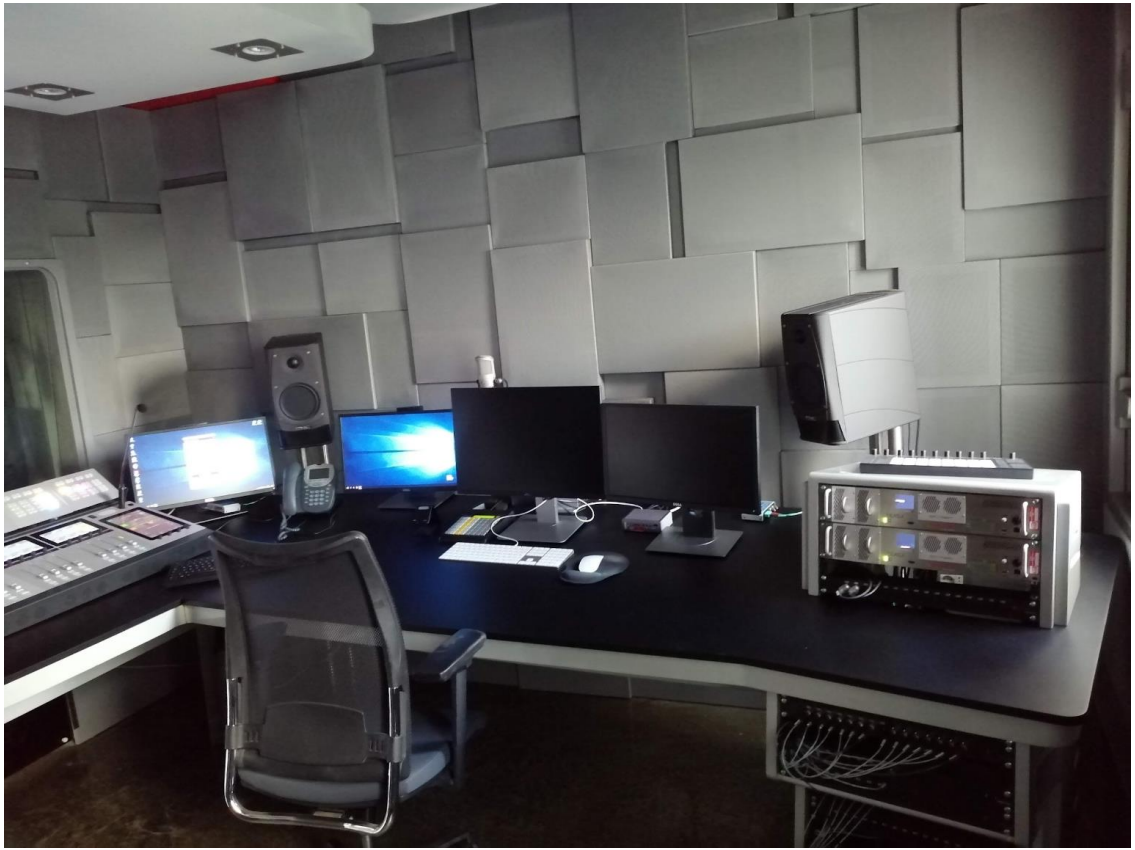
RDS Studio Edit1

RDS Auditorium

RDS Studio DSR

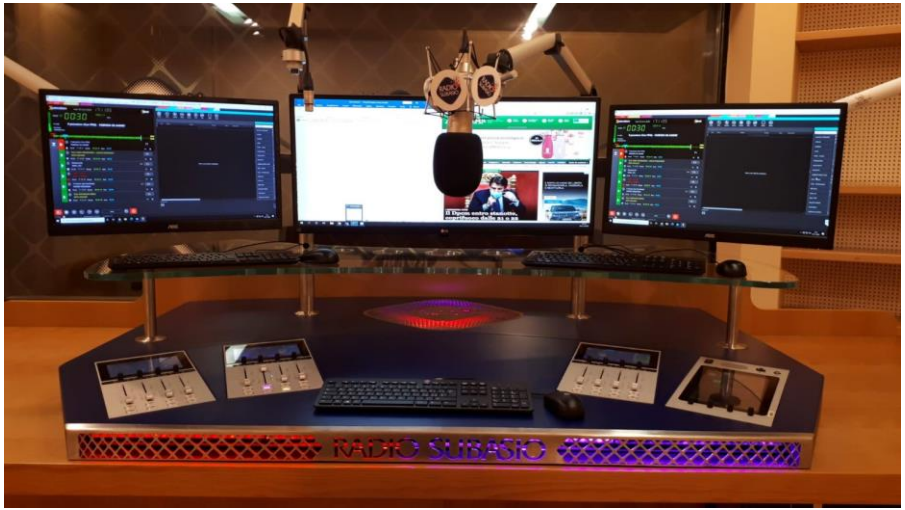


RDS Studio EDIT2



RAI (Cosenza)

Radio Subasio



Thank You