

# ON-AIR Designer Configuration Options

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# 1. Introduction

#### About this Manual

This document describes the configuration options supported by the **ON-AIR Designer**, Lawo's configuration tool for radio on-air systems.

The resources vary depending on the product and its license. Use the compatibility tables at the beginning of each chapter to check which options are supported by your product:

- **r** = ruby / Power Core
- **c** = crystal
- **sc** = sapphire compact
- **s** = sapphire / Nova17
- **N29** = Nova29.

You should be familiar with using the software, and in particular the 'Frame' and 'Tree Definition' windows. If not, please refer to the separate "ON-AIR Designer User Guide".

Look out for the following which indicate:

Notes - points of clarification.

Tips - useful tips and short cuts.

Attention - alert you when an action should always be observed.

#### Lawo User Registration

For access to the **Downloads** area and to receive regular product updates, please register at: <a href="http://www.lawo.com/registration">www.lawo.com/registration</a>.



# 2. Frame Options

This chapter describes the options in the 'Frame' menu.

There are six configuration windows which are used as follows.

Menu Path	Application	r	С	SC	S	N29
Frame -> Surface	Define the control surface modules and their parameters.	$\checkmark$	$\checkmark$	✓	✓	×
Frame -> System Core	Define the plug-in IO cards and other core options.	✓	$\checkmark$	✓	✓	✓
Frame -> Panels	Define external key panels and their parameters.	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓
Frame -> Screen	Define virtual control panels for operation from VisTool.	$\checkmark$	$\checkmark$	$\checkmark$	✓	✓
Frame -> Change Frame	Change the maximum specification of a component (e.g. upgrade the Power Core license).	~	~	~	~	~
Frame -> Function Pool	Create a temporary pool of MF Key functions.	$\checkmark$	×	×	×	×

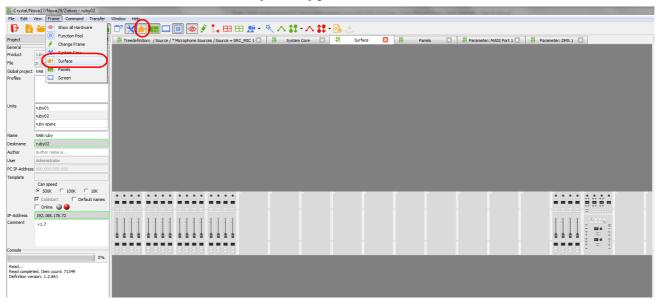


# 2.1 Frame -> Surface

The Surface configuration defines the control surface modules and their parameters. The example below describes a ruby surface. Other surfaces are configured in a similar manner.

1. Click on the <sup>1</sup> Toolbar icon, or select **Frame** -> **Surface**, to open the window:

Surface Configuration Window



The maximum size of the control surface is defined by the 'Frame Selection'.

For larger frames like the one above, you may need to scroll left or right to see all the modules. To see the complete surface (as shown above), click on the <sup>(2)</sup> Toolbar icon, or select **Frame** -> **Show All Hardware**. This will show (or hide) any unused panels or surfaces.

You can zoom in (or out) on by pressing and holding CTRL while scrolling your mouse-wheel.

Each module position represents a CAN bus address within the frame. This is a unique hexadecimal address which defines the role of each module.

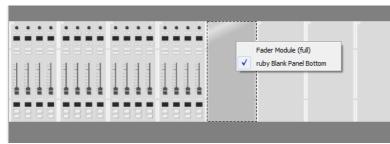
Can Bus Addresses (ruby)

																			-		
8888			8888												3 - 8	8 - 8					
x01	x02	x03	x04	x05	x06	x07	x08	x09	x0A	x0B	x0C	x0D	x0E	x0F	x10	x12	x13	x14	x15	x16	x17



2. To add or change a module, right-click on a slot and choose an option from the list.

Fader Module Assignment (ruby)



Note that the **Surface** configuration will not necessarily look like your physical console, as it is the CAN bus address assigned to each module which is important.

#### 3. Double-click on a module to open its parameter window.

Fader Module Parameters (ruby)

Treede	🕂 Treedefinition: / Source / * Microphone Sources / Source = SRC_MIC 1 🔝 👫 System Core 📧 👫 Burface 🔝 👫 Parameter: MADI Port 1 🔝 👫 Parameter: DMS 1 🖾 🧲 👬 Parameter: Fader Module (full) 01 (Adv. 01) 🔯 D													
Source	Direct Out	Module	PFL1 Swap	Channel Mapping	Snapshots	MF Key Mapping	VisChan1	VisChan2	VisChan3	VisChan4				
Iodule (Lab	el) M	1												
isable Laye	er 2 🗖													
efault Sou	rce 1.1 SR	C_MIC 1.Src		On	ly Default 🗌									
efault Sou	rce 1.2 SR	C_MIC 2.Src		On	ly Default 🗐									
efault Sou	rce 1.3 SR	C_MIC 3.Src		On	ly Default 🗌									
efault Sou	rce 1.4 SR	C_MIC 4.Src		On	ly Default 🗐									
efault Sou	rce 2.1			On	ly Default 🗌									
efault Sou	rce 2.2			On	ly Default 🗐									
efault Sou	rce 2.3			On	ly Default 🗌									
efault Sou	rce 2.4			On	ly Default 🗐									

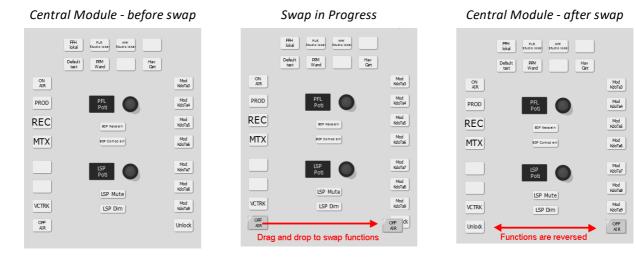
The same parameters can be accessed by opening the "Surface" branch of the 'Tree Definition'.

#### MF Key Swap

Return to the 'Surface' configuration window, and notice that on the Central Module you will see the MF Key labels for all configured functions.

Drag and drop an MF Key to swap the button functions - an arrow will appear when a valid "drop" position is reached.

This operation always swaps the functionality so you will never "lose" any of your existing programing. All connected logic is included in the swap.

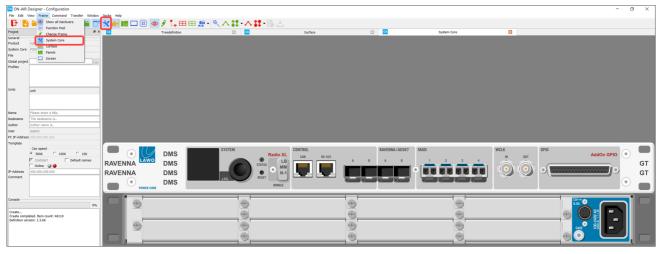




# 2.2 Frame -> System Core

The 'System Core' configuration defines the plug-in cards and IO parameters for the DSP Core. The example below describes Power Core. Other cores are configured in a similar manner.

1. Click on the X Toolbar icon, or select **Frame** -> **System Core**, to open the window.



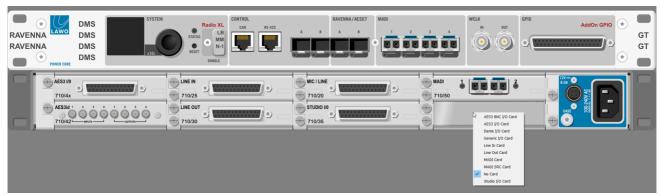
System Core Configuration

You can zoom in (or out) on by pressing and holding CTRL while scrolling your mouse-wheel.

For Power Core, the main license defined by the <u>'Frame Selection'</u> is printed above the DONGLE icon (e.g. **Radio XL**). If any add-on licenses are enabled, then these are highlighted in red (e.g. **AddOn GPIO**).

Double-click on the text RAVENNA, DMS or GT to open parameter windows for:

- **RAVENNA** the RAVENNA inputs and outputs.
- DMS used for VisTool metering or to create audio loopbacks.
- GT used to send GPIO-over-audio.
- 2. To add or change a plug-in card, right-click on a slot and choose an option from the list:



When you have completed the assignments, the on-screen 'Frame' should look identical to your DSP Core.

3. Double-click on an IO card or connector to access the input and output parameters.

The same parameters can be accessed by opening the "Audio Input" and "Audio Output" branches of the 'Tree Definition', and selecting the appropriate IO card.



# 2.3 Frame -> Panels

The "Panels" configuration defines any key panels connected to the system and their parameters.

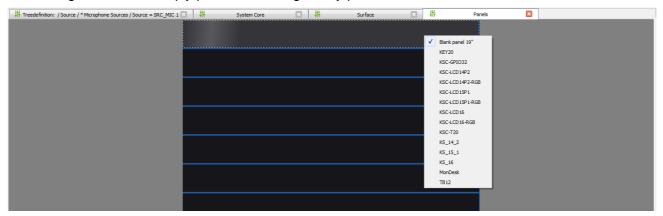
1. Click on the 📠 Toolbar icon, or select **Frame** -> **Panels**, to open the window:

Panels Configuration Window

fit Crystal/iv	ova1//Nova29/Zirkon - ruby02	
File Edit	View Frame Command Transfer	
🕒 🗗	Show all Hardware	] 『 🗙 📶 🗐 🎯 🌮 🖡 田 田 🕿 🗏 🥆 ∧ 🗱 - ∧ 🗱 - 🌭 🔄 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘 👘
Project	Function Pool     Change Frame	H Treederhon: / Source / Marghone Source - SRC /4C 1 🗋 🛱 System Core 🖸 🛱 Surface 🖸 🛱 Panels
General Product	ruby 🗙 System Core	
File	ps_Us III Surface	
Global project		
Profiles	Screen	
Units	ruby01	
	ruby02	
	ruby spare	
Name	NAB ruby	
Deskname	ruby02	
Author	Author name is	
User	Administrator	
PC IP-Address	000.000.000.000	

If this is a new configuration, then you will see a series of blank 19" frame panels. The maximum number of key panels is defined by the <u>'Frame Selection'</u>.

2. Right-click on an empty panel slot to assign a key panel:



3. Repeat to assign all the key panels connected to your system.

Panels Configuration (example)



Each slot position from top to bottom represents a CAN bus address. This is a unique hexadecimal address which defines the role of each panel within the system.

You can zoom in (or out) on by pressing and holding CTRL while scrolling your mouse-wheel.

The MF Key labels are shown for all existing functions. Drag and drop an MF Key to swap the button functions an arrow will appear when valid "drop" position is reached. This works in the same way as the Central Module MF Key swap described <u>earlier</u>.

4. Double-click on a panel to open its parameter window.

The same parameters can be accessed by opening the "Panel" branch of the 'Tree Definition'.

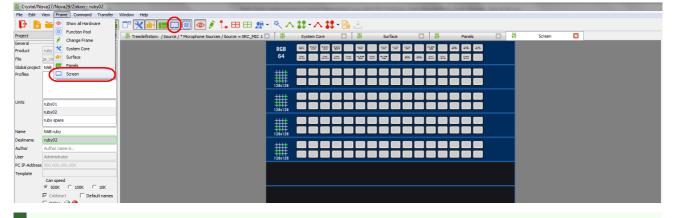


# 2.4 Frame -> Screen

The Screen configuration can be used to create virtual control panels which will be operated from VisTool.

1. Click on the — Toolbar icon, or select **Frame** -> **Screen**, to open the window:

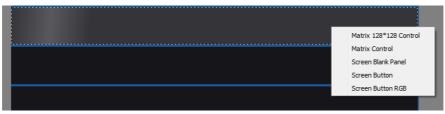
Screen Configuration Window



You can zoom in (or out) on by pressing and holding CTRL while scrolling your mouse-wheel.

The MF Key labels are shown for all existing functions. Drag and drop an MF Key to swap the button functions an arrow will appear when valid "drop" position is reached. This works in the same way as the Central Module MF Key swap described <u>earlier</u>.

2. Right-click on an empty panel slot to assign a Screen Panel:



The available options are:

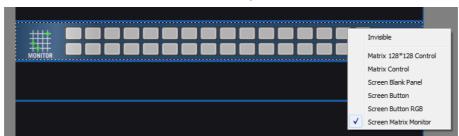
- Matrix 128 \* 128 Control an XY matrix panel of 128 x 128.
- Matrix Control an XY matrix panel of 90 x 30 (switched in pages).
- Screen Blank Panel a blank panel (to replace an existing panel).
- Screen Button 32 MF Key functions.
- Screen Button RGB 64 MF Key functions with self-labeling, RGB buttons.
- Scroll down to the lower slots and notice that some additional options become available:

Slot 11: Screen Matrix TB - a talkback switching panel, with 32 buttons:



3.





Slot 12: Screen Matrix Monitor - a monitor matrix control panel, with 32 buttons:

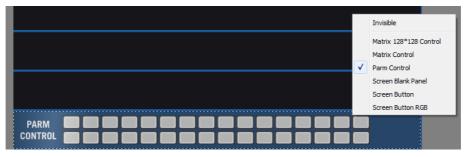
Slot 13: Network Assign - a network assign control panel, with 32 buttons:



Slot 14: Screen Src Assign - a fader strip assign control panel, with 32 buttons:



Slot 15: Parm Control - a DSP control panel, with 32 buttons:



4. Double-click on a panel to open its parameter window.

The same parameters can be accessed by opening the relevant branch of the 'Tree Definition':

- "Logic" for Matrix Control, Network Assign, Screen Src Assign or Parm Control.
- "MF Keys" for Screen Buttons.

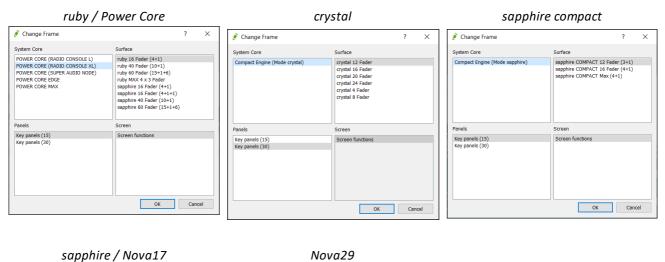


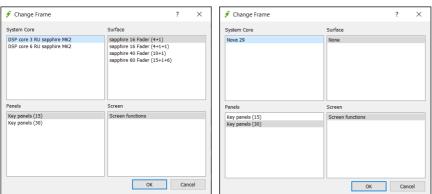
# 2.5 Change Frame

The 'Change Frame' window can be used to change the maximum specification of the system.

The options vary depending on the product specified when the project was created (via File -> New). All products supported by the ON-AIR Designer are shown below.

1. Select Frame -> change frame to open the window.





Here you can change the specification of any component: System Core, Surface, Panels or Screen.

2. If you change an option, click on **OK** - the software now loads the new configuration.

It may take a few seconds to load the new data. During this time the status is shown in the "progress" bar (below **Console** in the 'Project' window).

If the change lowers the specification of an existing configuration, then parameters are loaded to the available resources.



# 2.6 Frame -> Function Pool

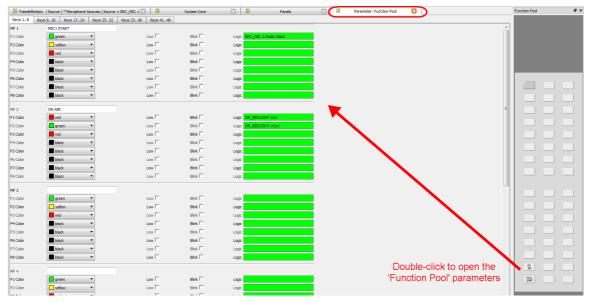
The Function Pool is available only for **ruby**. It can be used to prepare MF Keys before positioning them on a Central Module, or to move a function by swapping it to and from the 'Function Pool' panel. This is ideal if you know what functionality is required, but are not yet sure of the MF Key layout. The same parameters can be accessed from the 'Tree Definition'.

1. Click on the <sup>13</sup> Toolbar icon to show or hide the 'Function Pool'.

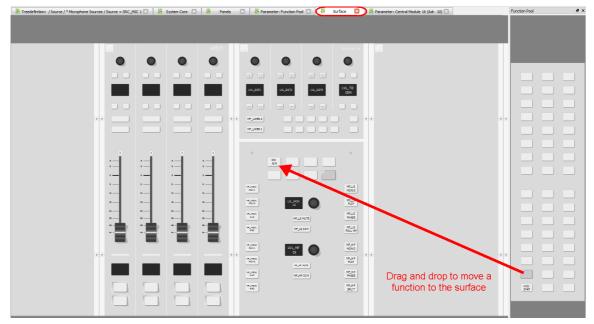
The window can be floating or docked to one side (left or right). See Arranging the Workspace.

2. Double-click on any MF Key in the window to open the Function Pool parameter window.

This shows all the dummy MF Keys available. Each one can be programed in the usual manner:



**3.** Now open the <u>Surface</u> configuration and drag and drop the MF Key from the Function Pool to the Central Module - an arrow will appear when a valid "drop" position is reached.



You can use the same drag and drop technique to move functions to and from the Function Pool panel. This allows you to easily rearrange an existing MF Key layout.



# 3. 'Tree Definition' Elements

This chapter describes the 'Tree Definition' elements.

The table below summarizes all possible elements.

'Tree Definition' Element	Application	r	C	SC	S	N29
Audio Input & Audio Output	Edit parameters for audio IO signals.	~	~	~	~	~
Audio Out only	Define DMS metering (for VisTool) and internal audio loopbacks. * In crystal, DMS and loopbacks appear in the "System -> Definition".	~	⊁*	~	~	~
Conf Bus	Create conference buses to generate mix minus/N-1 returns.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×
Connect	Create audio connection circuits.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Ember+	Configure remote control of parameters via Ember+.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	<b>√</b>
Ember+ A-stage	Configure remote control of an Astage device via Ember+.	$\checkmark$	×	×	×	×
GP Sum	Create "General Purpose" sums for applications such as talkback.	$\checkmark$	$\checkmark$	$\checkmark$	✓	×
<u>GPI/O</u>	Edit parameters for physical GPIO and GPIO-over-Audio (GT) signals.	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
GPI/O Network	Exchange GPIO signals with other systems via the control network.	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
Label	Configure dynamic editing of LCD button labels on external key panels.	$\checkmark$	×	×	✓	×
Level Control	Define assignable rotary controls (on a Central Module or key panel).	$\checkmark$	$\checkmark$	$\checkmark$	✓	×
Logic	Create logical functions to customize system behavior.	$\checkmark$	$\checkmark$	$\checkmark$	✓	$\checkmark$
MF Key	Define MF Key parameters for Central Modules, Key Panels and Screen Button Modules.	~	~	~	~	✓
<u>Minimix</u>	Create Minimixer circuits, ideal for monitoring.	✓	$\checkmark$	$\checkmark$	✓	<b>√</b>
<u>N-1</u>	Create additional N-1 returns to expand the mix minus capabilities.	✓	×	×	×	×
Panel	Define MF Key and Label parameters for external key panels.	✓	$\checkmark$	$\checkmark$	✓	$\checkmark$
<u>Source</u>	Create sources and edit their parameters.	$\checkmark$	$\checkmark$	$\checkmark$	✓	×
Sum Bus	Create summing buses and edit their parameters.	✓	$\checkmark$	$\checkmark$	$\checkmark$	×
<u>Surface</u>	Edit parameters for the control surface modules.	$\checkmark$	$\checkmark$	$\checkmark$	✓	×
<u>System -&gt;</u> Definition	Edit global options such as the sync reference, line-up signals, etc.	~	~	~	~	✓
Universal Sum In & Universal Sum Out	Create summing signals in a Nova29.	×	×	×	×	✓
<u>Vis Chan</u>	Map physical controls on Fader/Channel Modules to VisTool.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×



# 3.1 Audio Input / Audio Output

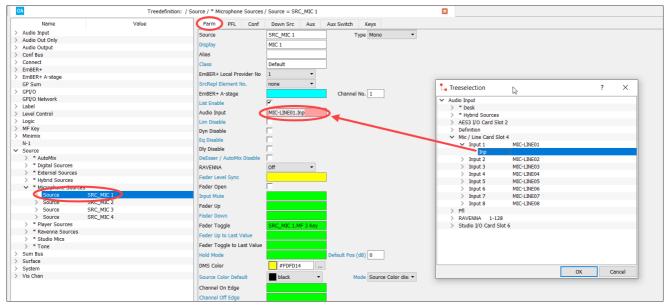
The "Audio Input" and "Audio Output" branches of the 'Tree Definition' provide access to parameters for the audio IO signals:

OA		Treede	finition: /	Audio Input / AES3 I/O Card Slot	6	×
Name	Value	Input	Output	Module		
✓ Audio Input		Input 1		Studio.Effekt ret.L	Type: Stereo 🔻	
AES3 I/O Card Slot 6		Offset Gair		0	Matrix enable ON	
> AES3 I/O Card Slot 7				0		
> DMS 1		Disable SR	C			
> DMS 2						
> DMS 3		Input 2		Studio.Effekt ret.R		
> DMS 4						
> Line In Card Slot 1		Offset Gair	1	0	Matrix enable ON 🔻	
> MADI Port Front 1						
> MADI Port Front 2		Input 3		Studio.AF-Dig.L	Stereo: 🔽	
> MADI Port Front 3		Offset Gair		0	Matrix enable ON 👻	
> MADI Port Front 4					Matrix enable ON	
> Mic / Line Card Slot 2		Disable SR	C			
> RAVENNA 1-128						
> RAVENNA 129-256		Input 4		Studio.AF-Dig.R		
> Audio Out Only		Offset Gair		× 0	Matrix enable ON -	
> Audio Output		Chiset Gali		<u> </u>		
> Conf Bus				[		
		Terret F		counties that the design	Channel 14	

The same parameters can be accessed by double-clicking on a connector in the '<u>Frame -> System Core</u>'. Parameters can also be edited in list form by selecting 'Command -> Inputs' or 'Command -> Outputs'.

The options vary depending on the type of System Core and its IO specification. The topics which follow describe all possible parameters for each signal type.

Once configured, the inputs and outputs of each physical IO card can be assigned to other elements via the "Audio Input" and "Audio Output" branches of the 'Tree Selection'. For example, to assign the audio input of a source:





# 3.1.1 MIC/LINE IN

AO	Parameter: Mic / Line Card Slot 4	×
Input Module		
Input 1	MIC.1	Type: Mono 🔻
Offset Gain	0	Matrix enable OFF 🔹
Line		48V 🔽
Fixed Mic Gain	OFF	
Input 2	MIC.2	
Offset Gain	0	Matrix enable OFF 🔻
Line		480
Fixed Mic Gain	OFF •	
Input 3	MIC.3	Stereo: 🗔
Offset Gain	0	Matrix enable OFF 🔹
Line		480
Fixed Mic Gain	OFF	
Input 4	MIC.4	
Offset Gain	0	Matrix enable OFF 🔻
Line		48V 🗌
Fixed Mic Gain	OFF	
Input 5	MIC.5	Stereo:
		Matrix enable OFF 💌

#### Input Parameters

Input N	Use this field to name the input. For mono inputs, you can enter up to 16 characters. For stereo or surround inputs, a two character suffix is automatically added (e.g. ".L"). Therefore, names should be limited to 14 characters.
Type / Stereo	Use the <b>Type</b> drop-down menu (on Input 1) to select:
	• Mono.
	<ul> <li>Stereo – links inputs 1-2 for stereo operation.</li> </ul>
	<ul> <li>5.1 – links inputs 1-6 for L, R, C, LFE, Ls, Rs surround.</li> </ul>
	• 5.1+2 - links inputs 1-6 for L, R, C, LFE, Ls, Rs surround + inputs 7-8 for stereo.
	On odd numbered inputs, select the Stereo checkbox to link the odd/even pair for stereo operation.
Offset Gain	Here you can enter a fixed analog offset gain for the input.
	For Mic inputs, this is separate from the operator-controlled "mic" gain on the surface.
Matrix Enable	<ul> <li>This option enables matrix control of the input. There are three options in the drop-down menu:</li> <li>ON – sets the input for "<u>Matrix Connect</u>" or "<u>Matrix Query</u>" functions, or external matrix control such as the MtxCon (NovaConnect) software.</li> <li>LS - sets the input for control from the optional Line Scheduler (LS) product. Please contact your local Lawo representative for details.</li> <li>OFF – the input is not enabled for external matrix control.</li> <li>After a cold start, any inputs set to Matrix Enable ON or LS may need to be connected to a matrix output.</li> </ul>
Line	<ul> <li>Use this checkbox to choose Mic or Line level operation.</li> <li>The mode changes the input impedance and also determines which controls become available when the source is assigned to a control surface:</li> <li>For Mic inputs, operators can adjust mic gain, 48V and a high-pass "rumble" filter.</li> <li>For Line inputs, these parameters are not available.</li> </ul>
48V	Select this checkbox to enable 48V phantom power permanently. For example, to apply 48V to a talkback microphone.
Fixed Mic Gain	Here you can choose a fixed microphone input gain that cannot be changed by the operator. For example, to enter a fixed input gain for a talkback mic.



# 3.1.2 LINE IN

AO	Parameter: Line In Card Slot 1	×
Input Module		
Input 1	HYBRID.CODEC.L	Type: Stereo 🔻
Offset Gain	0	Matrix enable OFF 🔻
Input 2	HYBRID.CODEC.R	
Offset Gain	0	Matrix enable OFF 🔻
Input 3	TEL.1	Stereo:
Offset Gain	0	Matrix enable OFF 🔻
Input 4	TEL.2	
Offset Gain	0	Matrix enable OFF 🔻
Input 5	LINE. 1.L	Stereo: 🔽
Offset Gain	0	Matrix enable OFF 🔻

#### Input Parameters

Input N	Use this field to name the input (as described <u>earlier</u> ).					
Type / Stereo	Jse the <b>Type</b> and <b>Stereo</b> fields to set the format of the input (as described <u>earlier</u> ).					
Offset Gain	Here you can enter a fixed analog offset gain for the input.					
Matrix Enable	This option enables matrix control of the input (as described earlier).					



# 3.1.3 LINE OUT

AO	Parameter: Line Out Card Slot 3	×
Output Module		
Output 1	LINE. 1/2.L	Type: Stereo 🔻
Offset Gain	0	Matrix enable ON 🔻
Default Audio		
Output 2	LINE. 1/2.R	
Offset Gain	0	Matrix enable ON 🔻
Default Audio		
Output 3	LINE.3/4.L	Stereo: 🔽
Offset Gain	0	Matrix enable ON 🔻
Default Audio		
Output 4	LINE.3/4.R	
Offset Gain	0	Matrix enable ON 🔻
Default Audio		
Output 5	LINE.5/6.L	Stereo: 🔽
Offset Gain	0	Matrix enable ON 🔻
Default Audio		

#### **Output Parameters**

Output N	Use this field to name the output (as described <u>earlier</u> ).				
Type / Stereo	Use the <b>Type</b> and <b>Stereo</b> fields to set the format of the output (as described <u>earlier</u> ).				
Offset Gain	re you can enter a fixed analog offset gain for the output.				
Matrix Enable	This option enables matrix control of the output (as described <u>earlier</u> ). If the option is enabled, you cannot use the <b>Default Audio</b> function.				
Default Audio	Double-click in the <b>Default Audio</b> box to assign a default audio source for the output. <b>Default Audio</b> assignments are automatically re-instated after a system cold start. This means that you can force a cold start to return to the <b>Default Audio</b> assignments if they are overridden during operation of the system. A <b>Default Audio</b> source cannot be assigned if <b>Matrix Enable</b> is active.				



# 3.1.4 AES3 IO

AO	Parameter: AES3 I/O Card Slot 6	5 🗵
Input Output	Module	
Input 1	Studio.MIC01.L	Type: Stereo 🔻
Offset Gain	0	Matrix enable ON 🔻
Disable SRC		
Input 2	Studio.MIC01.R	
Offset Gain	0	Matrix enable ON 🔻
Input 3	Studio.MIC03.L	Stereo: 🔽
Offset Gain	0	Matrix enable ON 🔻
Disable SRC		
Input 4	Studio.MIC03.R	
Offset Gain	0	Matrix enable ON 🔻
Input 5	Studio.MIC05.L	Stereo: 🔽
Offset Gain	0	Matrix enable ON 🔻
Disable SRC		

AO	Parameter: AES3 I/O Card Slot 6	×
Input Output	Module	
Output 1	Studio.Effekt snd.L	Type: Stereo 🔻
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.Effekt snd.L.Inp	
Output 2	Studio.Effekt snd.R	
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.Effekt snd.R.Inp	
Output 3	Studio.AF-Sumd.L	Stereo: 🔽
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.Summe dig.L.Inp	
Output 4	Studio.AF-Sumd.R	
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.Summe dig.R.Inp	
Output 5	Studio.AF-Mtxd.L	Stereo: 🔽
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.MTX dig.L.Inp	

#### **Input Parameters**

Input N	Use this field to name the input (as described <u>earlier</u> ).		
Type / Stereo         Use the Type and Stereo fields to set the format of the input (as described earlier)			
Offset Gain	Here you can enter a fixed digital offset gain for the input.		
Matrix Enable         This option enables matrix control of the input (as described <u>earlier</u> ).			

#### **Output Parameters**

Output N	Use this field to name the output (as described <u>earlier</u> ).
Type / Stereo	Use the <b>Type</b> and <b>Stereo</b> fields to set the format of the output (as described <u>earlier</u> ).
Offset Gain	Here you can enter a fixed digital offset gain for the output.
Matrix Enable	This option enables matrix control of the output (as described <u>earlier</u> ). If the option is enabled, you cannot use the <b>Default Audio</b> function.
Default Audio	Double-click in the <b>Default Audio</b> box to assign a default audio source for the output (as described <u>earlier</u> ).



# 3.1.5 STUDIO IO

OA	Parameter: Studio I/O Card Slot 5	×
Input Output	Phones Module	
Input 1	St-IO.MIC01	Stereo:
Offset Gain	0	Matrix enable OFF 🔻
Line		48V 🔽
Fixed Mic Gain	60dB ▼	
Input 2	St-IO.MIC02	
Offset Gain	0	Matrix enable OFF 💌
Line		48V
Fixed Mic Gain	OFF	

AO	Parameter: Studio I/O Card Slo	t 5 🗵
Input Output	Phones Module	
Output 1	Studio.AH LSP	Stereo:
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.AH LSP.L.Inp	
Output 2	Studio.AH LSP	7
Offset Gain	0	Matrix enable OFF 🔻
Default Audio	>DMS3.AH LSP.R.Inp	

#### Input Parameters

Input N	Use this field to name the input (as described earlier).
Stereo	On odd numbered inputs, select the <b>Stereo</b> checkbox to link the odd/even pair for stereo operation.
Offset Gain	Here you can enter a fixed analog offset gain for the input. For Mic inputs, this is separate from the operator-controlled "mic" gain on the surface.
Matrix Enable	This option enables matrix control of the input (as described earlier).
Line	Use this checkbox to choose Mic or Line level operation (as described earlier).
48V	Select this checkbox to enable 48V phantom power.
Fixed Mic Gain	Here you can choose a fixed microphone input gain that cannot be changed by the operator.

#### **Output Parameters**

Output N	Use this field to name the output (as described <u>earlier</u> ).				
Stereo	On odd numbered outputs, select the <b>Stereo</b> checkbox to link the odd/even pair for stereo operation.				
Offset Gain	Here you can enter a fixed analog offset gain for the output.				
Matrix Enable	This option enables matrix control of the output (as described <u>earlier</u> ). If the option is enabled, you cannot use the <b>Default Audio</b> function.				
Default Audio	Double-click in the <b>Default Audio</b> box to assign a default audio source for the output (as described <u>earlier</u> ).				

#### **Phones Parameters**

These parameters are identical to the output parameters described above.



# 3.1.6 MADI IO

#### **Input Parameters**

OA				Parameter	MADI Card Slot	8				×
Madi 1 Input	Madi 1 Output	Madi 2 Input	Madi 2 Output	Madi Settings	Module					
MADI 1 Input 01	MADI-IO.1/2.L		Тур	e: Stereo 🔻	Dig Offset Ga	in 0	Matrix enable	ON -	Transparent	-
MADI 1 Input 02	MADI-IO.1/2.R				Dig Offset Ga	in 0	Matrix enable	ON -	Transparent	
MADI 1 Input 03	MADI-IO.3/4.L		Type: Ster	eo 🔽	Dig Offset Ga	in 0	Matrix enable	ON -	Transparent	
MADI 1 Input 04	MADI-IO.3/4.R				Dig Offset Ga	in 0	Matrix enable	ON -	Transparent	
MADI 1 Input 05	MADI-IO.5/6.L		Type: Ster	eo 🔽	Dig Offset Ga	in 0	Matrix enable	ON -	Transparent	
MADI 1 Input 06	MADI-IO.5/6.R				Dig Offset Ga	in 0	Matrix enable	ON 👻	Transparent	
MADI 1 Input 07	MADI-IO.7/8.L		Type: Ster	eo 🔽	Dig Offset Ga	in O	Matrix enable	ON -	Transparent	
MADI 1 Input 08	MADI-IO.7/8.R				Dig Offset Ga	in 0	Matrix enable	ON 👻	Transparent	
MADT 1 Toput 00	MADT-TO 0/10 I		Tvn	e Steren v	Dia Offect Ca	in 0	Matrix enable	ON -	Transparent	

Input N	Use this field to name the input (as described <u>earlier</u> ).				
Type / StereoUse the Type and Stereo fields to set the format of the input (as described earlier).					
Dig Offset Gain	ffset Gain Here you can enter a fixed digital offset gain for the input.				
Matrix Enable This option enables matrix control of the input (as described <u>earlier</u> ).					
Transparent	Select this checkbox to set the input to be "transparent". The option should be enabled if you are using the input to route a Dolby E signal.				

## **Output Parameters**

OA				Parameter:	MADI Card Slot 8					
Madi 1 Input	Madi 1 Output	Madi 2 Input	Madi 2 Output	Madi Settings	Module					
MADI 1 Output 01	MADI-IO.1/2.L		Туре	e: Stereo 🔻	Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗌	Default Audio	
MADI 1 Output 02	MADI-IO.1/2.R				Dig Offset Gain 0	Matrix enable ON	-	Transparent	Default Audio	
MADI 1 Output 03	MADI-IO.3/4.L		Type: Stere	o 🔽	Dig Offset Gain 0	Matrix enable ON	-	Transparent	Default Audio	
MADI 1 Output 04	MADI-IO.3/4.R				Dig Offset Gain 0	Matrix enable ON	•	Transparent	Default Audio	
MADI 1 Output 05	MADI-IO.5/6.L		Type: Stere	o 🔽	Dig Offset Gain 0	Matrix enable ON	-	Transparent 🗌	Default Audio	
MADI 1 Output 06	MADI-IO.5/6.R				Dig Offset Gain 0	Matrix enable ON	-	Transparent	Default Audio	
MADI 1 Output 07	MADI-IO.7/8.L		Type: Stere	• 🔽	Dig Offset Gain 0	Matrix enable ON	•	Transparent	Default Audio	
MADI 1 Output 08	MADI-IO.7/8.R				Dig Offset Gain 0	Matrix enable ON	-	Transparent	Default Audio	
MANDE 1 Output 00	MADT TO 0/10 I		Time	Ctores -	Dia Offect Cain 0	Matrix anabla ON	-	Transportent	Dafault Audia	

Output N	Use this field to name the output (as described earlier).				
Type / Stereo	Use the <b>Type</b> and <b>Stereo</b> fields to set the format of the output (as described <u>earlier</u> ).				
Offset Gain Here you can enter a fixed digital offset gain for the output.					
Matrix Enable	This option enables matrix control of the output (as described <u>earlier</u> ). If the option is enabled, you cannot use the <b>Default Audio</b> function.				
Transparent	Select this checkbox to set the output to be "transparent". The option should be enabled if you are using the output to route a Dolby E signal.				
Default Audio	Double-click in the <b>Default Audio</b> box to assign a default audio source for the output (as described <u>earlier</u> ).				





#### **MADI Settings**

On **Power Core**, the following parameters configure the MADI ports on plug-in IO cards.

The same settings for other MADI ports can be accessed via the "<u>System -> Definition -> Parameter = MADI</u>" branch of the 'Tree Definition'.

OA				Parameter:	MADI Card Slo	ot 8
Madi 1 Input	Madi 1 Output	Madi 2 Input	Madi 2 Output	Madi Settings	Module	
Parameter	Madi					
P1 Enable 64 Tx	-Slots 🔽					
P2 Enable 64 Tx	Slots 🗹					
P1 Select Input 2	2					
P2 Tx = P1 Tx						

Parameter	Madi – reference name for the element.					
Enable 64 Tx Slots	When this checkbox is selected, the MADI port transmits 64 slots as opposed to 56. Note that the receiver automatically detects whether 56 or 64 slots are supplied. If the port is configured to transmit 64 slots and only 56 are received, then the last 8 slots are muted. The option can be selected for each individual MADI port.					
P1 Select Input 2	Click to assign a control signal to switch the MADI port from P1 to P2. Note that if <u>Sync from MADI</u> is enabled, then this will also switch the MADI sync source. The option can be selected for each odd/even pair of MADI ports.					
P2 Tx = P1 Tx	When this checkbox is selected, MADI port P2 transmits the same data as port P1. The option can be used to configure redundant MADI outputs. The option exists for each odd/even pair of MADI ports.					

#### 3.1.7 DANTE IO

The DANTE parameters are identical to those available for a MADI port. See MADI IO.

#### 3.1.8 RAVENNA IO

The RAVENNA IO parameters vary depending on the type of System Core. See Configuring Audio-over-IP.



### 3.1.9 Module Parameters

All IO cards in Power Core include a Module tab which can include either one or two options.

OA	Parameter: AES3 I/O Card Slot 2
Input Output Module	
Ignore Card  Enable Madi Loopbacks Off	

-	This option is available for all plug-in IO cards. If enabled, the IO card is ignored by the system alarm (monitored via the Web UI or alarm bus). This can be useful if a card is missing.
	This option is available for 8-channel IO cards only. It appears once the Loopbacks add-on license is enabled.

#### **Configuring the Loopbacks**

The "Enable MADI Loopbacks" option appears for 8-channel IO cards once the Loopbacks add-on license is enabled. It allows you to add 128 audio loopbacks for each IO card, and can be enabled on multiple cards if you wish. The option is available for physical IO cards only, and not the General I/O dummy card.

1. Start by turning on the "Enable MADI Loopbacks" option:



The loopbacks are presented as MADI input and MADI output signals, where each input is fed back from the corresponding output.

2. Use the "MADI Input" and "MADI Output" tabs to configure the loopback parameters.

#### Loopback Function (Input Parameters)

OA .			Parameter: A	ES3 I/O Card Slot 2			×
Input Output	Madi 1 Input	Madi 1 Output	Madi 2 Input Madi 2 Outp	ut Module			
MADI 1 Input 01	20		Type: Mono 🔻	Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent 🗌
MADI 1 Input 02				Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent 📃
MADI 1 Input 03			Type: Stereo	Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent 🗌
MADI 1 Input 04				Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent
MADI 1 Input 05			Type: Stereo	Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent 🗌
MADI 1 Input 06				Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent 📃
MADI 1 Input 07			Type: Stereo	Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent 🗌
MADI 1 Input 08				Dig Offset Gain 0	Matrix enable	OFF 🔻	Transparent

#### Loopback Function (Output Parameters)

OA			Parameter: AE	3 I/O Card Slot 2			×
Input Output Mad	i 1 Input Madi 1 Output	Madi 2 Input Madi 2 Outp	out Module				
MADI 1 Output 01	13	Type: Mono 🔻	Dig Offset Gain 0	Matrix enable OFF	•	Transparent 🗌	Default Audio
MADI 1 Output 02			Dig Offset Gain 0	Matrix enable OFF	-	Transparent	Default Audio
MADI 1 Output 03		Type: Stereo	Dig Offset Gain 0	Matrix enable OFF	-	Transparent	Default Audio
MADI 1 Output 04			Dig Offset Gain 0	Matrix enable OFF	-	Transparent	Default Audio
MADI 1 Output 05		Type: Stereo	Dig Offset Gain 0	Matrix enable OFF	-	Transparent	Default Audio
MADI 1 Output 06			Dig Offset Gain 0	Matrix enable OFF	-	Transparent	Default Audio
MADI 1 Output 07		Type: Stereo	Dig Offset Gain 0	Matrix enable OFF	-	Transparent	Default Audio
MADI 1 Output 08			Dig Offset Gain 0	Matrix enable OFF	•	Transparent	Default Audio

The parameters are the same as for a <u>MADI IO</u> card. The audio source for each loopback is defined by the **Default Audio** field (in the "MADI Output" tab).



# 3.2 Audio Out only (DMS & Loopbacks)

All systems provide **DMS** elements which can be assigned to a VisTool page for metering, or used to create audio loopbacks to feed signals back into other parts of the system. Mono DMS can be linked to operate in stereo or surround. Each DMS channel is equipped with silence detect logic.

The number of DMS and the implementation varies depending on the system:

- ruby / Power Core and sapphire MK2 / Nova17 support 256 DMS presented in 4 groups of 64.
- **sapphire compact** and **Nova29** support 64 DMS. In addition, **Nova29** supports 256 loopbacks which operate as loopbacks only (without metering and silence detection). These are presented in 4 groups of 64.
- **crystal** supports 48 DMS (in two pages) plus 32 loopbacks which operate as loopbacks only (without metering and silence detection).

For all systems except crystal, the **DMS Input** and **DMS Loopback / Silence** parameters are accessed from either the "Audio Input" or "Audio Out Only" branches of the 'Tree Definition'. The same parameters can be accessed by double-clicking on **DMS** in "Frames -> System Core".

For crystal, the **DMS** and **Loopback** parameters are accessed from the "System -> Definition" branch of the 'Tree Definition'.

DMS parameters can also be edited in list form from the "Command -> Inputs" window.



# 3.2.1 DMS Input Parameters

OA	Treedefinition	: / Audio O	Out Only / DMS 1		×								
Name	Value	DMS Inp	DMS Loopback / Silence										
> Audio Input		Meter 1	Wahl1 snd L	Type: Stereo 🔻	Matrix enable	OFF .	Label	Wahl 1	Audio	Wahl1 quelle.Out.L	Color	#FFFF00	···· ^
✓ Audio Out Only		Meter 2	Wahl1 snd.R		Matrix enable	OFF .	Label		Audio	Wahl1 quelle.Out.R	Color	#FFFF00	
> DMS 1 > DMS 2		Meter 3	Wahl2 snd.L	Type: Stereo 🗹	Matrix enable	OFF -	Label	Wahl 2	Audio	Wahl2 quelle.Out.L	Color	#FFFF00	
> DMS 3		Meter 4	Wahl2 snd.R	Í	Matrix enable	OFF .	Label		Audio	Wahl2 quelle.Out.R	Color	#FFFF00	
> DMS 4		Meter 5	RLWahl1 snd.L	Type: Stereo 🔽	Matrix enable	OFF .	Label	RL Wahl1	Audio	N-Wahl1.Out.L	Color	#FFFF00	
> Audio Output		Meter 6	RLWahl1 snd.R		Matrix enable	OFF .	Label		Audio	N-Wahl1.Out.R	Color	#FFFF00	
> Conf Bus > Connect		Meter 7	RLWahl2 snd.L	Type: Stereo 🗹	Matrix enable	OFF -	Label	RL Wahl2	Audio	N-Wahl2.Out.L	Color	#FFFF00	
> EmBER+		Meter 8	RLWahl2 snd.R	í	Matrix enable	OFF .	Label		Audio	N-Wahl2.Out.R	Color	#FFFF00	
EmBER+ A-stage		Meter 9	Modr.PC1	Type: Mono 🔻	Matrix enable	OFF .	Label	Mod	Audio	St-Mic.Mod.Inp	Color	#FFFF00	
> GP Sum		Meter 10	Modr.PC2	1	Matrix enable	OFF .	Label	Co	Audio	St-Mic.Comod.Inp	Color	#FFFF00	
> GPI/O		Meter 11	Modr.PC3	Type: Stereo	Matrix enable	OFF .	Label	Gst1	Audio	St-Mic.Gast1.Inp	Color	#FFFF00	
> GPI/O Network > Label		Meter 12	Modr.PC4		Matrix enable	OFF -	Label	Gst2	Audio	St-Mic.Gast2.Inp	Color	#FFFF00	

Metern	Reference name for the meter.
Туре	On the 1st input of eight, you can select the following options from the drop down menu: • Mono.
	Stereo – normal stereo L/R operation.
	• 5.1 – this option links 1-6 of the set for L, R, C, LFE, Ls, Rs surround.
	• <b>5.1+2</b> - this option links 1-8 of the set for 5.1 surround, as above, plus separate stereo input.
	On other odd numbered DMS, you have the option to check the Stereo box to link the odd/even pair for stereo operation.
Matrix Enable	This option enables matrix control of the DMS. There are three options in the drop-down menu:
	• <b>ON</b> – sets the input for " <u>Matrix Connect</u> " or " <u>Matrix Query</u> " functions, or external matrix control such as the MtxCon (NovaConnect) software.
	• LS - sets the input for control from the optional Line Scheduler (LS) product. Please contact your local Lawo representative for details.
	OFF – the input is not enabled for external matrix control.
	After a cold start, any inputs set to Matrix Enable <b>ON</b> or <b>LS</b> may need to be connected to a matrix output.
Label	Enter a label for the DMS.
Audio	Assigns the default audio signal. Note that the audio feeding a DMS may also be configured in reverse - for example, the DMS may be assigned as the audio input to another configuration element. In this case, the default audio is overridden.
Color	Define the color for each DMS channel. The color is used for PPM bars in VisTool.



# 3.2.2 DMS Loopback / Silence Parameters

0.0	Too definition	n: / Audio Out (	Date / DMC 1	-								
<u>•••</u>	Treedenniuo		JNIY / DMS 1	×	2							_
Name	Value	DMS Input	DMS Loopback / Silence									
> Audio Input		Loopback 1	Wahl1 ret.L	Type: Stereo	<ul> <li>Matrix enable OFF</li> </ul>	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	^
✓ Audio Out Only		Loopback 2	Wahl1 ret.R		Matrix enable OFF	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
> DMS 1 > DMS 2		Loopback 3	Wahl2 ret.L	Type: Stereo 🗹	Matrix enable OFF	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
> DMS 3		Loopback 4	Wahl2 ret.R		Matrix enable OFF	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
> DMS 4		Loopback 5	RL Wahl1 ret.L	Type: Stereo 🗹	Matrix enable OFF	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
> Audio Output		Loopback 6	RL Wahl1 ret.R		Matrix enable OFF	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
> Conf Bus > Connect		Loopback 7	RL Wahl2 ret.L	Type: Stereo 🔽	Matrix enable OFF	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
> EmBER+		Loopback 8	RL Wahl2 ret.R		Matrix enable OFF	<ul> <li>Siler</li> </ul>	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec)	Timeout high (sec)	
EmBER+ A-stage		Loopback 9	Mods.PC1	Type: Mono	<ul> <li>Matrix enable ON</li> </ul>	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec) 2	Timeout high (sec) 0	
> GP Sum		Loopback 10	Mods.PC2		Matrix enable ON	▼ Siler	nce: Thrs low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec) 2	Timeout high (sec) 0	
> GPI/O		Loopback 11		Type: Stereo	Matrix enable ON		nce: Thrs low (dBR)		Thrs high (dBR) -20	Timeout low (sec) 2	Timeout high (sec) 0	
> GPI/O Network		Loopback 12		- (per starter)	Matrix enable ON		nce: Thrs low (dBR)		Thrs high (dBR) -20	Timeout low (sec) 2	Timeout high (sec) 0	
> Label		LOODDACK 12	MOUS.PC4		Matrix enable ON	<ul> <li>Siler</li> </ul>	ice: This low (dBR)	-30	Thrs high (dBR) -20	Timeout low (sec) 2	Timeout nigh (sec)	

Loopback n	Reference name for the loopback.
Туре	Select mono, stereo, 5.1 or 5.1+2 for each loopback.
Matrix Enable	This option enables matrix control of the loopback, with options for ON, LS and OFF. See Matrix Enable.
Silence Thrs low (dBR)	Enter the level at which the silence detect will become active.
Thrs high (dBR)	Enter the level at which the silence detect will become inactive. Use these two values to set a range to avoid flicker.
Timeout low (sec)	Enter the period of time, for which the level must be below the defined threshold to activate the silence detect. Use 0 for immediate signalisation.
Timeout high (sec)	Enter the period of time, for which the level must be above the defined threshold to deactivate the silence detect.

Note that the audio inputs to the loopbacks correspond to the DMS Input described on the previous page.



## 3.2.3 Loopbacks only (crystal & Nova29)

In **crystal** and **Nova29**, the Loopbacks support audio loopbacks only (without metering and silence detection). The screenshots below are taken from a Nova29 configuration. To access the Loopbacks in a crystal system, select "**System** -> **Definition**" in the 'Tree Definition' and the **Loopback** tab. In both cases, the parameters are identical.

OA .			Treedefinition: / Audio Input / L	oopback Port 01					
Name	Value	Loopback Output	Loopback Input						
<ul> <li>Audio Input</li> </ul>		Output 1	LB01.OUT 01	Type: Mono 🔻	Matrix enable ON	-			
> DMS		Output 2	LB01.OUT 02		Matrix enable ON	-			
<ul> <li>Loopback Port 01</li> <li>Loopback Port 02</li> </ul>		Output 3	LB01.OUT 03	Type: Stereo	Matrix enable ON	•			
Loopback Port 02		Output 4	LB01.OUT 04		Matrix enable ON	•			
> Loopback Port 04		Output 5	LB01.OUT 05	Type: Stereo	Matrix enable ON	•			
> MADI Port 01		Output 6	LB01.OUT 06		Matrix enable ON	-			
MADI Port 02 MADI Port 03		Output 7	LB01.OUT 07	Type: Stereo	Matrix enable ON	-			
> MADI Port 03		Output 8	LB01.OUT 08		Matrix enable ON	-			
> MADI Port 05		Output 9	LB01.OUT 09	Type: Mono 🔻	Matrix enable ON	-			
> MADI Port 06		Output 10	LB01.OUT 10		Matrix enable ON	-			
> MADI Port 07			Lines out is						
oopback n		Reference name	e for the output.						
уре		Select mono, st	ereo, 5.1 or 5.1+2 for	each loopback.					

 Matrix Enable
 This option enables matrix control of the loopback, with options for ON, LS and OFF. See

 Matrix Enable.
 Matrix Enable.

OA				Treedefinition: / Audio Input / Lo	oopback Port 01		(
	Name	Value	Loopback Output	Loopback Input			
✓ Aud	io Input		Input 1	LB01.IN 01	Type: Mono 🔻	Matrix enable ON	•
>	DMS		Default Audio	Internal.Binary Ones			
>	Loopback Port 01		Derduit Addio	Internal binary ones			
>	Loopback Port 02						
>	Loopback Port 03		Input 2	LB01.IN 02		Matrix enable ON	•
>	Loopback Port 04		Default Audio				
>	MADI Port 01			-			
>	MADI Port 02		Input 3	LB01.IN 03	Type: Stereo	Matrix enable ON	•
>	MADI Port 03			Ebolinitos	Type: Stored J		
>	MADI Port 04		Default Audio				
>	MADI Port 05						
>	MADI Port 06		Input 4	LB01.IN 04		Matrix enable ON	-
>	MADI Port 07		Default Audio				
>	MADI Port 08						

Input n	Reference name for the input.				
Туре	On the 1st input of eight, you can select the following options from the drop down menu:				
	• Mono.				
	Stereo – normal stereo L/R operation.				
	• 5.1 – this option links 1-6 of the set for L, R, C, LFE, Ls, Rs surround.				
	<ul> <li>5.1+2 - this option links 1-8 of the set for 5.1 surround, as above, plus separate stereo input.</li> </ul>				
	On other odd numbered DMS, you have the option to check the Stereo box to link the odd/even pair for stereo operation.				
<b>latrix Enable</b> This option enables matrix control of the DMS. There are three options in the drop-down menu:					
	<ul> <li>ON – sets the input for "<u>Matrix Connect</u>" or "<u>Matrix Query</u>" functions, or external matrix control such as the MtxCon (NovaConnect) software.</li> </ul>				
	• LS - sets the input for control from the optional Line Scheduler (LS) product. Please contact your local Lawo representative for details.				
	• OFF – the input is not enabled for external matrix control.				
	After a cold start, any inputs set to Matrix Enable <b>ON</b> or <b>LS</b> may need to be connected to a matrix output.				
Default Audio	Assigns the default audio signal.				





## 3.2.4 DMS (crystal)

In crystal, the DMS parameters are simplified. They are accessed by selecting "System -> Definition" in the 'Tree Definition' and the DMS tab.

In this instance, when Channel Meters are added to a VisTool screen, they can be switched between two pages using the **Select Page 1** and **Select Page 2** control signals.

	OA				Tre	edefinitio	n: / Systen	n / Definiti	ion					×	
Γ	Name	Value	Audio	Logic	OAC	TCP	Alarm	DMS	EmBER+	Project	Loopback	GT In	GT Out	AccessGrp 1	
	Audio Input		Parameter	r (	DMS										
>	Audio Output														
	Conf Bus		Select Pag	je i											
3	Connect		Select Pag	je 2											
	EmBER+		Channel /	Page	20			_							
	GP Sum		,	· - 3 - 1											
	GPI/O														
	GPI/O Network														
>	Level Control														
>	Logic														
	MF Key														
>	Minimix														
	Source														
>	Sum Bus														
	Surface														
~	<ul> <li>System</li> </ul>														
	> Definition														
)	Vis Chan														

Parameter         DMS - reference name for the element.	
Select Page N         Enter a control signal to switch the VisTool Channel Meters to Page N.	
Channel / Page	Enter the number of meters you wish to display per page (maximum 24). This value should be set to 24 by default. If a lower value is entered, then faders above the value cannot be addressed.



# 3.3 Conf Bus

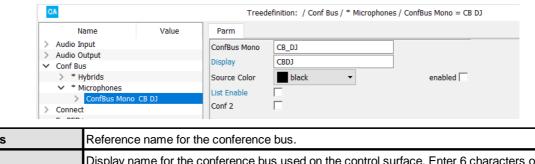
The conference system is used to generate mix minus/N-1 feeds for particular sources within your configuration.

There are two separate conference systems available (Conf 1 and Conf 2).

In each case, the sources within the system receive an automatically switched mix minus feed. i.e. When their source fader is open (on-air), they hear all summed faders minus themselves. When their source fader is closed (off-air), they hear only members of the conference system minus themselves. This allows conference members to hear each other while they are off-air.

#### 3.3.1 Creating Conf Buses

The "Conf Bus" branch of the 'Tree Definition' allows you to create conference buses and define their parameters.



ConfBus	Reference name for the conference bus.			
Display name for the conference bus used on the control surface. Enter 6 characters or less				
Source Color	Selects the color used to illuminate the LAWO backlight on the control surface when this source is assigned to a fader strip. Tick the <b>enabled</b> checkbox to enable color coding.			
List Enable	Select this checkbox if you wish the conf bus to be added to the source selection list when assigning sources from the control surface.			
Conf 2	Select this checkbox if you wish the bus to be part of the second Conference system. Unchecked, the bus will automatically default to Conference 1.			



### 3.3.2 Conf Bus Assignments

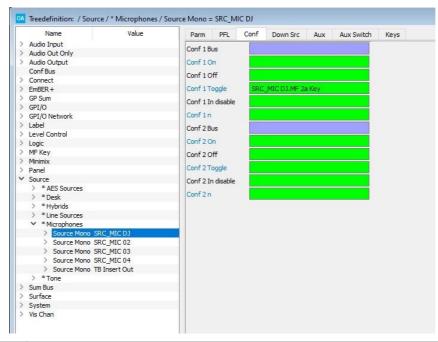
Select the **Conf** tab in the "**Source**" branch of the 'Tree Definition' to assign a conference bus to each source.

All options are repeated for the two separate conference systems – Conf 1 and Conf 2. By using the command "Conf 1 In disable" or "Conf 2 In disable", you can form different mix-minus/conference group. i.e. Sources working on Conf 1 need not be included in Conf 2 and vice versa.

When working with two conference groups, please note:

- Sources assigned to different conference groups cannot communicate while a conference is active.
- When a source is assigned to both conference groups it is required to configure the switching or summing of the Conf buses separately.
- Conf buses with the attribute "**Conf 2**" (see below) must only be set as a Conf 2 bus within the sources. The same applies to Conf 1.

The source parameters in the 'Tree Definition' are as follows. All options are repeated for Conf 1 and Conf 2.



Conf 1 Bus	Assigns a Conf Bus to the source. This sets the relationship between the source and the bus in order to generate the N-1 mix.			
Conf 1 On	Turns on the Conference system with a rising edge.			
Conf 1 Off	Turns off the Conference system with a rising edge.			
Conf 1 Toggle	Changes the state of the Conference system with a rising edge.			
Conf 1 In disable	A rising edge removes the source from all conference buses that are assigned to the Conference 1 system. A falling edge reassigns the source. For example, this might be linked to the presenter's cough switch.			
Conf 1n	If a source is assigned to a Conf Bus 1, then you can use the control input Conf 1n to assign its own signal to the conference bus. With a rising edge source is added and with a falling edge it is taken away.			



The following control outputs appear in the 'Tree Selection' under "Logic -> GroupName -> SourceName".

Conf active	Active when Conf is switched on for this source, but not any other source, and the fader is closed. (i.e. there is one conference source off-air). In this state, the Conference system is disabled and the source receives a sum of all faders minus themselves.
Conf prepare	Active when Conf is switched on and the fader is open. In this state, the Conference system is disabled and the source receives a sum of all faders minus themselves.
Conf off	Active when Conf is switched off. The fader state is irrelevant. In this state, the source does not contribute to the Conference system.
Conf Audio	Active when Conf is switched on and the fader is closed for this and at least one other source. (i.e. there is at least one conference source off-air). In this state, the Conference system is enabled and the source receives a mix of the conference members minus themselves. This allows Conference members to hear each other while they are off-air.
Conf in use	Active when Conf is switched on.



# 3.4 Connect

Connect elements are used to create audio connection circuits.

Several elements are supported for different applications. The table below summarizes all possibilities.

'Connect' Element	Application	r	С	SC	S	N29		
<u>Connect</u>	A stereo-in-stereo-out audio connect.	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$		
The three Intercom elen	The three Intercom elements can be used to create communications setups.							
Intercom Local	Intercom Local         Configure a local intercom system from a single device.		×	×	$\checkmark$	$\checkmark$		
Intercom Net Server	Configure an intercom system with multiple consoles and routers.	$\checkmark$	×	×	$\checkmark$	✓		
Intercom Net Client	Works in conjunction with the Intercom Net Server.	$\checkmark$	✓	✓	$\checkmark$	$\checkmark$		
Matrix Connect	Control mono or stereo matrix crosspoints.	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$		
Matrix MultiConnect	Similar to the 'Matrix Connect' but for multiple crosspoints.	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$		
Matrix Query	Monitor the status of a "Matrix Connect".	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
Mix remote	A special connect used to route sources to GP Sums.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×		
Priconnect	An 8-into-1 mono connect with prioritized switching.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
RAVENNA Connect 8	Connect streams available on the network to RAVENNA inputs.	✓	×	×	×	×		
RAVENNA Query 8	Monitor the status of a 'RAVENNA Connect'.	$\checkmark$	×	×	×	×		
TConn64	A 64-into-1 stereo connect.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$		
UDP Matrix	Transmit audio over Ethernet using the UDP protocol.	$\checkmark$	×	×	$\checkmark$	×		



#### 3.4.1 Connect

#### "Connect -> Connect"

This element is a stereo-in-stereo-out audio connect which can feed other elements such as a <u>Minimixer</u> or <u>DMS Loopback</u>. By defining two elements, one for the on and one for the off state, you can create a simple A/B input switch.

	Name	Value	General	
	lio Input		Connect	Input A/B
	lio Out Only		Connect	
	lio Output		In	DJ Microphone 1.Key
	ance Control		Audio In 1	MIC 01 - DJ.Inp
	if Bus			
	inect		Audio Out 1	Input A/B.In.L
~	* Desk		Audio In 2	
	> Connect	Input A/B	Audio Out 2	
		nnect Mute Madi Port	Audio Out 2	
	* Headphones			
	* Main Bus			
	* Monitoring * Talkback			
	ent State			
> EmB GP S	BER+			
> GPI				
	/O Network			
Hidd				
> Labe				
7.5.6	el Control			
> Logi				
> MF				
✓ Minir				
	* Headphones			
	* Main Bus			
	* Microphones			
	> Minimixer	Input A/B		
>	* Monitoring			
	* oct			

Connect	Reference name for the element.
In Assigns an input control signal to switch the connect on.	
Audio In 1	Selects the left and right input sources.
Audio In 2	
Audio Out 1	Selects the left and right output destinations.
Audio Out 2	



#### 3.4.2 Intercom Local, Net Server & Net Client

The three Intercom elements can be used to create communications setups. They work in conjunction with the **InterCom** software and are described <u>later</u>.

#### 3.4.3 Matrix Connect

#### "Connect -> Matrix Connect"

This element allows you to control matrix cross points via MF keys, GPIs or logical functions.

Every "Matrix Connect" can control an internal or external matrix address. Note that the input and output you use must have their <u>Matrix Enable</u> option set.

Name	Value	General			
<ul> <li>Audio Input</li> <li>Audio Out Only</li> <li>Audio Out Only</li> <li>Balance Control</li> <li>Conf Bus</li> <li>Connect</li> <li>         * Desk         <ul> <li>Connect</li> <li>Matrix Connect</li> <li>Matrix Multi Connet</li> <li>* Headphones</li> <li>* Manin Bus</li> <li>* Monitoring</li> <li>* Off Air Record</li> <li>* Telkback</li> <li>Element State</li> <li>GP Sum</li> </ul> </li> </ul>	Input A/B MTX1 Ct. Mute Madi Port	Matrix Connect Condition Matrix Input Matrix Output External External Protocol Type EmBER + Matrix No. Protect	MTX1 89 89 CAN over TCP/IP none	•	Type: Stereo Type: Stereo Type: Stereo

Matrix Connect	Reference name for the element.			
Condition	Assigns the control signal which will make the matrix connection.			
Matrix Input	Enter the address of the matrix input (see <u>Matrix Numbers</u> ; 0 = silence).			
Type: Stereo	Select this checkbox if the matrix input is stereo. Note that the address in the 'Matrix Input' field is that of the left channel.			
Matrix Output	Enter the address of the matrix output (see Matrix Numbers).			
Type: Stereo	Select this checkbox if the matrix output is stereo. Note that if the matrix input is mono, it will be routed to both left and right outputs.			
External Select this checkbox if the matrix to be controlled is external (i.e. not within the system				
External Protocol Type	<ul> <li>If External is ticked, select the communication protocol type:</li> <li>CAN over TCP/IP - for sapphire, crystal, Nova29 or Power Core.</li> <li>MNOPL - for mc<sup>2</sup>/Nova73.</li> <li>EmBER+ - for supporting EmBER+ devices.</li> </ul>			
EmBER+ Matrix Nr	When using <b>Ember+</b> , you must enter an Ember+ Matrix number (from <b>1</b> to <b>5</b> ). This references the <u>Ember+ Matrix</u> element (which defines the local consumer number, external matrix type, matrix name, etc.)			
Protect	When checked, the Matrix Connect cannot be removed by any other system. For example, if the matrix cross point is visible to other controllers such as the NovaConnect software, setting Protect will prevent these controllers from changing their status.			



#### 3.4.4 Matrix Multi Connect

#### "Connect -> Matrix Multi Connect"

This element is very similar to a "<u>Matrix Connect</u>", but it allows you to control multiple cross points from a single MF key, GPI or logic function.

The cross points are made to and from a range of sequential inputs and outputs. In the example below we have defined a single input (address 0 = silence) to connect to 64 outputs starting from matrix address 129. Therefore, this example will mute all 64 channels of a MADI port.

Other applications include re-routing MADI connections or performing multiple stereo connects. Note that if you define a larger number of outputs than inputs, the inputs wrap around – for example, two inputs would be routed to outputs 1/2, 3/4, 5/6 and so on within the sequence.

0/	74 Treedefinition: / Connect / * Desk / Matrix Multi Connect							
Γ	Name	Value	General					
	Audio Input		Matrix Multi Connect	Mute Madi Port				
	Audio Out Only		Matrix Multi Connect	Mute Madi Port				
	Audio Output		Condition					
	Balance Control		Matrix Input	0	Number of Inputs 1			
	Conf Bus		Haut A triput					
~	Connect		Matrix Output	129	Number of Outputs 64			
	✓ * Desk		External					
	Matrix Multi Connect	Mute Madi Port			1			
	> * Headphones		External Protocol Type	CAN over TCP/IP				
	> * Main Bus		EmBER + Matrix No.	none 🔻				
	> * Monitoring			-				
	> * Talkback		Protect					
	Element State							
	EmBER +							
	GP Sum							
	ont lo							

Matrix Multi Connect	Reference name for the element.	
Condition	Assigns the control signal which will make the matrix connections.	
Matrix Input	Enter the address of the first matrix input you wish to connect (see <u>Matrix Numbers</u> ; address $0 = silence$ ).	
Number of Inputs	Enter the number of inputs in the connection range.	
Matrix Output	Enter the address of the first matrix output you wish to connect (see Matrix Numbers).	
Number of Outputs	Enter the number of outputs in the connection range.	
External	Select this checkbox if the matrix to be controlled is external (i.e. not within the system frame).	
External Protocol Type	<ul> <li>If External is ticked, select the communication protocol type:</li> <li>CAN over TCP/IP - for sapphire, crystal, Nova29 or Power Core.</li> <li>MNOPL - for mc<sup>2</sup>/Nova73.</li> <li>EmBER+ - for supporting EmBER+ devices.</li> </ul>	
EmBER+ Matrix Nr	When using <b>Ember+</b> , you must enter an Ember+ Matrix number (from <b>1</b> to <b>5</b> ). This references the <u>Ember+ Matrix</u> element (which defines the local consumer number, external matrix type, matrix name, etc.)	
Protect	When checked, the Matrix Multi Connects cannot be removed by any other system. For example, if the cross points are visible to other controllers such as the NovaConnect software, setting Protect will prevent these controllers from changing their status.	



### 3.4.5 Matrix Query

#### "Connect -> Matrix Query"

This element provides the ability to monitor the status of a matrix connect, and produce a "logical 1" control signal if the connect is removed. For example, to trigger an alarm if a specific crosspoint is removed.

Every "Matrix Query" can monitor an internal or external matrix address. Note that the input and output you use must have their <u>Matrix Enable</u> option set.

General				
Matrix Query	1 -> 1 Connected			
Matrix Input				
Matrix Output				
External	Г			
External Protocol Type	CAN over TCP/IP	-		
EmBER + Matrix No.	none	•		

Matrix Query	Reference name for the element.	
Matrix Input	Enter the address of the matrix input to be monitored (see Matrix Numbers).	
Matrix Output	Enter the address of the matrix output to be monitored (see <u>Matrix Numbers</u> ).	
External	Select this checkbox if the matrix to be controlled is external (i.e. not within the system frame).	
External Protocol Type	<ul> <li>If External is ticked, select the communication protocol type:</li> <li>CAN over TCP/IP - for sapphire, crystal, Nova29 or Power Core.</li> <li>MNOPL - for mc<sup>2</sup>/Nova73.</li> <li>EmBER+ - for supporting EmBER+ devices.</li> </ul>	
Ember+ Matrix Nr         When using Ember+, you must enter an Ember+ Matrix number (from 1 to 5). This references the Ember+ Matrix element (which defines the local consumer number matrix type, matrix name, etc.)		



### 3.4.6 Mix Remote

#### "Connect -> Mix Remote"

A **Mix Remote** can be used to route a source to a summing bus when the summing bus is a <u>GP Sum</u>. In each case, insert the element under the "**Connect**" branch of the 'Tree Definition'. Then define its parameters as follows.

Name	Value	General	
> Audio Input		Mix remote	CD to RECORD BUS
> Audio Out Only		and the second second	CD 10 RECORD D03
> Audio Output		Mix On	
Balance Control		Mix Off	
> Conf Bus			
✓ Connect		Mix Toggle	CD.Key
> * Desk		Mix AF	
* Headphones		1.00	
> * Main Bus		Source	CD.Src
> * Monitoring		GP Sum	RECORD BUS.Sum
<ul> <li>* Off Air Record</li> </ul>		11	
> Mix remote CD	IN RECORD BUS	Level	
> * Talkback		Default Level	0
Element State			
> EmBER +			
> GP Sum			
> GPI/O			
GPI/O Network			
Hidden			
> Label			
> Level Control			
> Logic			
> MF Key			

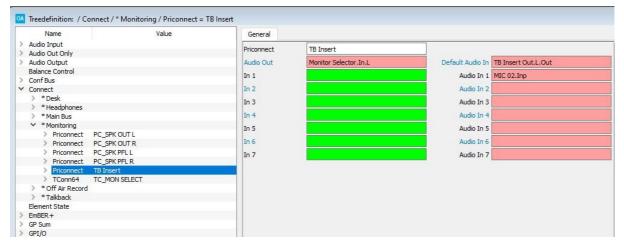
Mix Remote	Reference name for the element.
Mix On	Assigns an input control signal to turn on the source-to-bus assignment.
Mix Off	Assigns an input control signal to turn off the source-to-bus assignment.
Mix Toggle	Assigns an input control signal to toggle the state of the source-to-bus assignment.
Mix AF	Assigns an input control signal to switch the source-to-bus assignment post fader. If not defined, the assignment will be pre fade.
Source	Selects the source to be assigned.
GP Sum	Selects the GP Sum to assign to.
Level	Assigns a VCA control to control the level of the source to bus assignment.
Default Level	Sets the default level at which the source will be assigned to the bus.



## 3.4.7 Priconnect

#### "Connect -> Priconnect"

The **Priconnect** combines the logic function <u>Prio</u> with the routing function <u>Connect</u>. Each element provides an 8-into-1 mono connect with prioritized switching. It is ideal for applications such as talkback insertion over a monitor chain.



Priconnect	Reference name for the element.
Audio Out	Assigns the audio output.
Default Audio In	Assigns the audio source which you will normally hear when no input control signals are active.
In N	Assigns an input control signal to switch the Priconnect to the corresponding Audio In.
Audio In N	Assigns the audio source for each input.

Input 7 takes highest priority. For example, if both input 4 and input 7 triggers are active, then input 7 is the audio source routed to the output of the Priconnect.



# 3.4.8 RAVENNA Connect 8

#### "Connect -> RAVENNA Connect 8"

This element can be used to connect incoming streams from the network to <u>RAVENNA inputs</u>. It is supported by Power Core systems.

Each element supports up to 8 connections each with its own logical trigger.

Name	Value	General								
> Audio Input		RAVENNA	Connect 8	AV_Connect_MAIN	]					_
Audio Out Only							_		-	
Audio Output		Input (RA)	Core Out) 01	DFLT.In001.Ravenr	Stream Name	MSTR:Stream1	Trigger	Connect_1.Out		
Balance Control		Input (RA)	Core Out) 02	DFLT.In002.Ravenr	Stream Name	MSTR:Stream2	Trigger	Connect_2.Out		
Conf Bus				DFLT.In003.Ravenr		L	=			
Connect * Desk		Input (RAV	Core Out) 03	DFL1.In003.Ravenr	Stream Name	MSTR:Stream3	Trigger	Connect_3.Out		
RAVENNA Connect	8 DAV Connect MA	Input (RA)	Core Out) 04		Stream Name		Trigger			
Element State	6 KAV_CONNECL_MA	Input (RA)	Core Out) 05		Stream Name		Trigger			
EmBER+										
GP Sum		Input (RAV	Core Out) 06		Stream Name		Trigger			
GPI/O		Input (RA)	Core Out) 07		Stream Name		Trigger			
GPI/O Network		Input (BA)	Core Out) 08		Stream Name		Trigger			
Hidden		input (ion	0010 000,000		bucannanc		mage		-	
Label										
Level Control										
Logic										
MF Key										
Minimix										
Panel										
Ravenna Input										
Source Sum Bus										
Surface										
System										
Vis Chan										
VIS CHAIT										

RAVENNA Connect 8	Reference name for the element.
Input (RAV Core Out) 01-08	Enter the input that will subscribe to a stream from the network.
	Enter the name of the stream exactly as it is defined in the network. Examples could be MSTR:Stream1, R3LAY01, etc.
Trigger	Assign the logic element that will initiate the connect.





## 3.4.9 RAVENNA Query 8

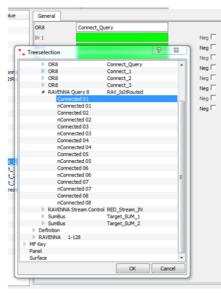
#### "Connect -> RAVENNA Query 8"

This element works in conjunction with the <u>RAVENNA Connect 8</u>. It can be used to monitor the status of the stream connection.

OA	Inputs 🛛 🗙	OA Surface	×	AO	Syste	m Core 🗵 🔼 Treede	finition: / Conn	ect / * Desk / RAVENNA Query 8
	Name	Value	General					
⊳ Au	dio Input		DAVENNU	Query 8		RAV IsItRouted	1	
⊳ Au	dio Out Only		RAVENINA	Query 8		RAV_ISITROUTEd		
Au	dio Output		Input (R/	V Core Out	) 01	DFLT.In017.Ravenna Input	Stream Name	R3LAY01
	lance Control		Input (P)	V Core Out	102		Stream Name	
Co	nf Bus							L
	nnect		Input (R/	V Core Out	) 03		Stream Name	
4	* Desk RAVENNA Connect 8	RAV Connect MAIN	Input (R/	V Core Out	) 04		Stream Name	
	RAVENNA Query 8		Input (R/	V Core Out	) 05		Stream Name	
Ele	ment State		Input (R/	V Core Out	06		Stream Name	
⊳ Em	BER+							
	Sum		Input (R/	V Core Out	) 07		Stream Name	
⊳ GP			Input (R/	V Core Out	) 08		Stream Name	
	I/O Network							
	lden							
Lab								
	vel Control							
Log								
⊳ MF								
	nimix							
Par								
	venna Input							
Sol								
	m Bus							
▷ Sui								
▷ Sys								
▷ Vis	Chan							

RAVENNA Query 8	Reference name for the element.
Input (RAV Core Out) 0108	Enter the input that will be queried regarding whether a stream from the network is subscribed.
Stream Name	Enter the name of the stream exactly as it appears in the network.

The outputs appear under the "Logic" branch of the 'Tree Selection' window:



RAVENNA Query 8	Reference name for the element.
Connected 0108	True if the configured stream is connected.
nConnected 0108	True if the configured stream is not connected.



## 3.4.10 TConn64

#### "Connect -> TConn64"

The TConn64 is a 64-into-1 stereo connect, ideal for larger monitoring signal selectors. Each TConn64 may be assigned up to 64 stereo audio inputs which are switched to a single stereo output by 64 trigger inputs.

Switch between parameters using the Global and In 1-16, In 17-32, etc. menu tabs at the top of the parameter area.

### In 1-64 Parameters

Audio In N.2

Treedefinition: / Con	nect / * Monitoring / 1	Conn64 = TC_N	MON SELEC	т				
Name	Value	Global	In 1-16	In 17-32	In 33-48	In 49-64		
> Audio Input		Trigger In	1					
> Audio Out Only								
> Audio Output		Audio In 1	.1					
Balance Control Conf Bus		Audio In 1	.2					
✓ Connect		Trigger In	2					
> * Desk								
> * Headphones		Audio In 2	2.1					
> * Main Bus		Audio In 2	2.2					
✓ * Monitoring		Triager In	-					
> Priconnect P	SPK OUT L	Trigger In						
> Priconnect P		Audio In 3	3.1					
> Priconnect P		Audio In 3	3.2					
> Priconnect P		Tringent						
> Priconnect T		Trigger In				4		
	C_MON SELECT	Audio In 4	ł.1					
> * Off Air Record > * Talkback		Audio In 4	1.2					
Element State		Trigger In	-					
r In N	Assigns an	input con	itrol sig	nal whic	conn	ects:		
	Audio In		idia O					
	Audio In	IN. I 10 AL		uli				
	Audio In	N.2 to Au	udio O	ut 2				
In N.1	Assigns the	e left audio	o input	source.				
	J J							

Assigns the right audio input source.



### **Global Parameters**

Name Va	Global	In 1-16	In 17-32	In 33-48	In 49-64	
> Audio Input	TConn64		TC MON SEL	ECT		
> Audio Out Only	1 Conno4		TC_MON SEL	ECT		
> Audio Output	Audio In F	PO 1				
Balance Control Conf Bus	Audio In F	PO 2				
✓ Connect	Audio Ou	t 1	LP_TC MONT	TOR IN.L.Out		
> * Desk > * Headphones	Audio Out	t 2	LP_TC MONI	TOR IN.R.Out	t	
> * Main Bus	In State					
<ul> <li>* Monitoring</li> <li>&gt; Priconnect</li> <li>PC SPK OUT L</li> </ul>	Pushout					
> Priconnect PC SPK OUT F	Disable					
<ul> <li>Priconnect PC_SPK PFL L</li> <li>Priconnect PC_SPK PFL R</li> </ul>	Reset					Default
Priconnect TB Insert	Preset					
TConn64 TC_MON SELE						

TConn64	Reference name for the element.
Audio In PO 1	Assigns the left Push Out audio input. If the <b>Pushout</b> option is active and no <b>Trigger In</b> signal is true, then this audio source is routed to <b>Audio Out 1</b> . This can be used to define a default audio connection for the TConn64.
Audio In PO 2	Assigns the right Push Out audio input. As above, but routes to <b>Audio Out 2</b> .
Audio Out 1	Assigns the left output, routed from Audio In N.1 when the Trigger N signal is active.
Audio Out 2	Assigns the right output, routed from Audio In N.2 when the Trigger N signal is active.
In State	Can be assigned to the <b>OutState</b> of another <b>TConn64</b> , a <u>Button16</u> or <u>Button64</u> in order to cascade elements (see below). Or, to the <b>Save Out</b> state from a <u>System Definition -&gt; Parameter = ElementState</u> snapshot in order to respond to snapshot recalls.
Pushout	When checked, <b>Pushout</b> is active.
Disable	Inhibits the setting of another trigger.
Reset	This control signal resets the TConn64. It can be used to define a default connection which is activated by the <b>Reset</b> control signal. If <b>Pushout</b> is active, and the <b>Reset</b> control signal is triggered then <b>Audio In PO 1</b> and <b>2</b> are
	assigned to <b>Audio Out 1</b> and <b>2</b> . If <b>Pushout</b> is not active, and the <b>Reset</b> control signal is triggered then the <b>Preset</b> inputs (below) are assigned to <b>Audio Out 1</b> and <b>2</b> .
Preset	Enter the number of the audio input which you wish the TConn64 to reset to when <b>Reset</b> is actioned. This is also the state which the TConn64 will reset to after a cold start.

#### **Control Outputs**

The individual control outputs of the TConn64 appear under the "Logic -> <GroupName> -> TConn64" of the 'Tree Selection' window. In addition, you will find the element's **Out State** under "Element State -> GroupName -> TConn64".

The Global -> In State of a TConn64 can be assigned to the Out State of another TConn64, <u>Button16</u> or <u>Button64</u> in order to cascade elements. The Out State of the master element should be assigned to the In State of the slave. The slave will then follow all switch changes which occur in the master.

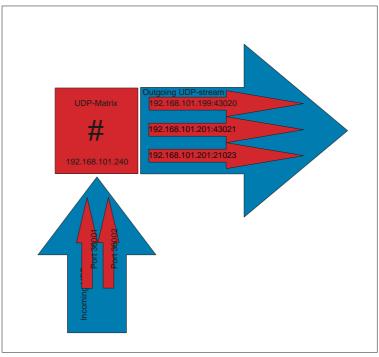


## 3.4.11 UDP Matrix

### "Connect -> UDP Matrix"

The **UDP Matrix** element allows you to configure matrix inputs and outputs for UDP network traffic. This allows an external matrix to control the connections and, hence, the flow of network traffic.

Incoming UDP traffic can be routed from any input port to any IP Address/Port:



The matrix numbers for UDP inputs and outputs begin from 769. See Matrix Numbers.

First, add a UDP Matrix element to the "Connect" branch of the 'Tree Definition' and then defines its parameters.

### **Global Parameters**

Name	Value	^	Global	Input	Output	
> Audio Input			UDP Matri	10		
> Audio Out Only			ODP Matri	x		
> Audio Output			Send Disa	bled		
Balance Control						
Conf Bus						
✓ Connect						
✓ *Desk						
> Priconnect	LSP LF					
> Priconnect	LSP Rf					
> TConn64	MON MAIN CLfe					
> TConn64	MON MAIN LR					
> TConn64	MON MAIN LfRf					
> TConn64	MON MAIN LSRs					
VDP Matrix						
Send Disable						
UDP Input 1						
Matrix enabl						
UDP Port Nu						
UDP Input 2						
Matrix enabl						
UDP Port Nu						
LIDD Toput 2						



## **Input Parameters**

Name	Value	Global Input Output	
> Audio Input			H LL APP
> Audio Out Only		UDP Input 1	Matrix enable OFF 🔹
> Audio Output		UDP Port Number	
Balance Control			
Conf Bus			
<ul> <li>Connect</li> </ul>		UDP Input 2	Matrix enable OFF 🔹
✓ * Desk		UDP Port Number	
> Priconnect	LSP Lf		
> Priconnect	LSP Rf		
> TConn64	MON MAIN CLfe	UDP Input 3	Matrix enable OFF 🔻
> TConn64	MON MAIN LR	UDP Port Number	
> TConn64	MON MAIN LIRF		
> TConn64	MON MAIN LsRs		
UDP Matrix		UDP Input 4	Matrix enable OFF 🔻
Send Disable		UDP Port Number	
UDP Input 1	L		
Matrix enab			
UDP Port Nu		UDP Input 5	Matrix enable OFF 🔹
UDP Input 2		UDP Port Number	
Matrix enab			
UDP Port Nu			
UDP Input 3		UDP Input 6	Matrix enable OFF
Matrix enab		UDP Port Number	
UDP Port Nu			
UDP Input 4			
Matrix enab		UDP Input 7	Matrix enable OFF 🔹
UDP Port Nu		UDP Port Number	
UDP Input 5			

UDP Input 1 to 24	Names each input.
UDP Port Number	Assigns the Ethernet port number for the input.
Matrix Enable	Selects whether the input is matrix enabled. See Matrix Enable.

## **Output Parameters**

Name	Value	Global Input Output	
> Audio Input		UDP Output 1	Matrix enable OFF 🔻
Audio Out Only			
> Audio Output		IP Address	UDP Port Number
Balance Control			
ConfBus		UDP Output 2	Matrix enable OFF 🔻
✓ Connect			
✓ *Desk		IP Address	UDP Port Number
> Priconnect	LSP LF		
> Priconnect	LSP Rf	UDP Output 3	Matrix enable OFF 🔻
> TConn64	MON MAIN CLfe		
> TConn64	MON MAIN LR	IP Address	UDP Port Number
> TConn64	MON MAIN LfRf		
> TConn64	MON MAIN LSRs	UDP Output 4	Matrix enable OFF 🔻
UDP Matrix			
Send Disable	ed .	IP Address	UDP Port Number
UDP Input 1			
Matrix enabl			Make with order wi
UDP Port Nu		UDP Output 5	Matrix enable OFF 🔻
UDP Input 2		IP Address	UDP Port Number
Matrix enabl			
UDP Port Nu			
UDP Input 3		UDP Output 6	Matrix enable OFF 🔻
Matrix enabl		IP Address	UDP Port Number
UDP Port Nu			
UDP Input 4			
Matrix enabl		UDP Output 7	Matrix enable OFF 🔻
UDP Port Nu		IP Address	UDP Port Number
UDP Input 5			

UDP Output 1 to 24	Names each output.
UDP IP Address	Assigns the Ethernet IP Address for the output.
UDP Port Number	Assigns the Ethernet port number for the output.
Matrix Enable	Selects whether the output is matrix enabled. See Matrix Enable.



# 3.5 Ember+

**Ember+** is a non-proprietary TCP/IP control protocol which allows the system to remotely control, or be controlled by, an external device. More details about the Ember+ protocol can be found at <a href="https://github.com/Lawo/ember-plus/wiki">https://github.com/Lawo/ember-plus/wiki</a>.

All devices should be connected to the Lawo control network in the usual manner.

An Ember+ provider "publishes" parameters so that they may be controlled, or responded to, by an external consuming device. Please see the <u>Ember+ Tree</u> for a guide to all parameter paths and values.

Up to 5 Ember+ providers and 15 Ember+ consumers are defined in the "<u>System -> Definition</u>" branch of the 'Tree Definition'. This allows you to change what is published to each external device, and how parameters are consumed.

Several elements are supported for different applications. The table below summarizes all possibilities.

'Ember+' Element	Application	r	С	SC	S	N29				
Ember+ GPIO	Exchange GPIO signals with another Ember+ device.	✓	✓	$\checkmark$	✓	$\checkmark$				
The three Ember+ Internal elements trigger source or summing bus parameter values and report back their status.										
Ember+ Internal FuncCall	Trigger an Ember+ Function Call.	~	~	~	~	×				
Ember+ Internal Src Control	Trigger up to 8 source or summing bus parameters.	~	~	~	~	×				
Ember+ Internal Src Query	Query the value of a specific Ember+ parameter path.	~	~	~	~	×				
Ember+ Matrix	Allow remote control of matrix crosspoints via Ember+.	✓	✓	$\checkmark$	✓	✓				
Ember+ Orban CODEC	Control simple call operations within an Orban CODEC.	~	~	~	~	✓				
Ember+ R3LAY (Jade)	Control parameters within Lawo's R3LAY software.	✓	$\checkmark$	$\checkmark$	✓	×				
Ember+ RAVENNA	Publish RAVENNA parameters to the network * In Power Core, RAVENNA parameters are published from the <u>Control Settings</u> in the "System -> Definition".	*	~	~	~	✓				
Ember+ SrcRepl	Couple a source to another Ember+ device. Once replicated, all selected parameters operate in parallel.	~	~	~	~	×				
Ember+ V_pro8 GPI	Control presets within a Lawo V_pro8 via Ember+.	✓	✓	$\checkmark$	✓	$\checkmark$				



## 3.5.1 Ember+ GPIO

An **EmBER+ GPIO** element can be used to exchange GPIO signals with another Ember+ device. Each element provides 32 GPIs and 32 GPOs plus 8 level inputs and outputs.

To use this element, the system must be configured as an Ember+ Provider, Ember+ Consumer or both (via the "System -> Definition -> Parameter = Local Providers/Local Consumers" branch of the 'Tree Definition').

The Link Mode option then defines how the Ember+ GPIO element behaves in this device:

- An Ember+ provider publishes parameters so that they may be controlled by a consuming device.
- An Ember+ consumer can control, or respond to, GPIO parameters published by an Ember+ provider.

For bi-directional control you will need to configure one Ember+ GPIO element in this console and a mirroring element (provider or consumer) in the external device.

### **Global Parameters**

Name	Value	^	Global	Logic Outputs 116	Logic Outputs 173	2	Level Outputs 18	Logic Inputs 116	Logic Inputs 1732	Level Inputs 18
Audio Input			EmBER + C	SPIO	EmbGPIO1		1			
Audio Out Only Audio Output			Link Mode		via Local Provider	-	Í			
Balance Control			LINK MODE							
Conf Bus			Behaviour	on Connection Loss	Keep Input Values	•				
Connect							-			
Element State			Local Prov	rider No.	1	-				
EmBER+					100 100 101 100		1			
> * Desk			Remote C	onsumer IP Address (0=all			1			
* External Device			Provider N	Ionitoring allowed						
EmBER + GPIO	EmbGPIO1									
> GPI 1										
> GPI 2										
> GPI 3										
> GPI 4										
> GPI 5										
> GPI 6										
> GPI 7										

Ember+ GPIO	Reference name for the element. This must be identical to the Reference name used by the corresponding consuming (or providing) device. See <u>Ember+ Naming</u> .
Link Mode	Sets whether the element is a Local Provider or Local Consumer.
Behaviour on Connection Lost	<ul> <li>If the Link Mode = Local Provider, then this option determines what happens if the network connection to the consuming device is lost:</li> <li>Choose Keep input values to keep parameters in their current state (recommended).</li> </ul>
	<ul> <li>Choose Set Input Values to 0 to reset parameters to their default state.</li> <li>Note that the provider has a time out of 1 minute before determining that the connection is lost. The consumer does not recognize a connection loss.</li> </ul>
Local Provider Nr.	If the Link Mode = Local Provider, enter the <u>number</u> of the Ember+ provider you wish to use (as defined under "System -> Definition -> Parameter = Local Providers").
Remote Consumer IP Address	If the Link Mode = Local Provider, enter the IP Address of the Ember+ consumer. Only this device will be allowed to change the GPI values.
Provider Monitoring allowed	When ticked, devices other than the one defined by the <b>Remote Consumer IP Address</b> can "listen" to the provider's GPIOs. Note that this will increase the amount of network traffic.
Local Consumer Nr.	If the Link Mode = Local Consumer, enter the <u>number</u> of the Ember+ Consumer you wish to use (as defined under "System -> Definition -> Parameter = Local Consumers").



## Logic Inputs 1..32

These tabs configure the 32 GP inputs:

	Name	Value	^	Global	Logic Out	puts 116	Logic Outputs 1732	Level Out
>	Audio Input			GPI 1		Red Light		_
	Audio Out Only			GFII		Red Light		-
>	Audio Output			GPI 2				
	Balance Control			GPI 3		<u> </u>		_
>	Conf Bus			GFI 5				-
>	Connect			GPI 4		2		
	Element State			GPI 5				
Y	EmBER+			GFIJ				-
	✓ * Desk			GPI 6				
	EmBER + GPIO			GPI 7				
	> GPI 1	Red Light				[		=
	> GPI 2			GPI 8		2		
	> GPI 3			GPI 9				
	> GPI 4			10000		L		- 7

# GPIs 1 to 32 will correspond to GPOs 1 to 32 within the mirroring device, providing that the Ember+ GPIO elements on both sides have an identical Reference Name. See Ember+ Naming.

### Logic Outputs 1..32

GPI x

These tabs configures the 32 GP outputs:

Name	Value ^	Global	Logic Outputs 116	Logic Outputs 1732	Level Outputs 18	Logic Inputs 11	6 Logic Inputs 1732	Level Inputs 18		
> Audio Input		GPO 1	Remote Red	Light	Out	REDLIGHT.Key				
> Audio Out Only		a server server	Remote Red	Light	Out	REDEIGHTIREY				
> Audio Output		GPO 2			Out					
Balance Control		GPO 3			Out					
Conf Bus		and the second sec			-				2	~
> Connect		GPO 4			Out	-0	Treeselection		?	$\times$
Element State		GPO 5			Out		EmBER +			
✓ EmBER+		a second second			-		GPI/O			^
✓ * Desk		GPO 6			Out		Logic			
EmBER + GPIO		GPO 7			Out		MF Key			
> EmBER + Internal FuncCall	RampFa				-		> * AES Sources			
EmBER + Internal SrcCtrl	ParamCtrl1	GPO 8			Out	_				
EmBER + Internal SrcQuery	Mic1_Co	GPO 9			Out		> * Aux Bus			
> EmBER + Matrix	Audio-M	1.000			-		> * Desk			
> EmBER + Orban CODEC	CODEC1	GPO 10			Out		> * Groups			
> EmBER + SrcRepl	SrcRepS	GPO 11			Out		> *Hybrids			
> EmBER + V pro8 GPI	GPI				-		* Line Sources * Main Bus			
> GPI 1		GPO 12			Out		/ Main Dus			
> GPI 2		GPO 13			Out		> * Microphones			
> GPI 3					-		> * Monitoring			
> GPI 4		GPO 14			Out		> * Off Air Record			
> GPI 5		GPO 15			Out		> *Tone			
> GPI 6					-		> Central Module (Adr.			
> GPI 7		GPO 16			Out		Key Extension Module			
> GPI 8							<ul> <li>Screen Button RGB Mo</li> </ul>			
> GPI 9							> MF 1	FuncCall Result		
> GPI 10							> MF 2	STUDIO SEL 2		
> GPI 11							> MF 3	STUDIO SEL 3		
> GPI 12							> MF 4	CD		
> GPI 12							> MF 9	default map		
> GPI 15							> MF 10	Map1		
> GPI 14 > GPI 15							✓ MF 11	REDLIGHT		_
> GPI 15							Key			
> GPI 18							> MF 17	V_pro8_GPI_1		
							> MF 18	V_pro8_GPI_2		
> GPI 18 > GPI 19							> MF 19	V_pro8_GPI_3		
							> MF 20	V_pro8_GPI_4		
> GPI 20										-
> GPI 21 > GPI 22								OK	Ca	ancel
> GPI 23										
PO x		Rofo	rence name	for the output						
		I Vere	rence name	ior the output						
			c 1 to 32 wil	l correspond t	to CDk 1 to 3	2 within t	ha mirroring d	levice, providing t	hat tl	ho
			3 1 10 02 Wil	reonespond			ie minoring o	levice, providing t	παι ι	
		Emb	er+ GPIO ele	ements on bo	th sides have	e an identi	cal Reference	Name. See Em	ber+	
		Nam	ing.							
		. ·	• •			000 ·				
Dut		Assig	gn an input c	ontrol signal t	o trigger the C	GPO - in d	our example, t	the console's Re	d Lig	ht

MF Key.



## Level Inputs 1..8

This tab configures the 8 level inputs:

OA Treedefinition: / EmBER+ / * De	esk / EmBER+ GPI	0							
Name	Valu	e ^	Global	Logic Outputs 116	Logic Outputs 1732	Level Outputs 18	Logic Inputs 116	Logic Inputs 1732	Level Inputs 18
> Audio Input			Level 1	GPIO1_IN		7			
> Audio Out Only			Lever1	GPIOI_IN		_			
> Audio Output			Level 2						
Balance Control			Level 3			7			
> Conf Bus						-			
> Connect			Level 4						
Element State			Level 5						
✓ EmBER+		_				=			
✓ * Desk			Level 6						
EmBER + GPIO			Level 7						
EmBER + Internal FuncCal						=			
> EmBER + Matrix	Audio-Matrix		Level 8						
> EmBER + Orban CODEC	CODEC1								
> EmBER + SrcRepl	SrcRepSap1	_							
> EmBER + V_pro8 GPI	GPI								
> GPI 1									
> GPI 2									
Level x		Reference	ce nam	ne for the leve	el input.				
					•				
		Once na	med. a	a GP level ca	n be used in a	similar man	ner to other	_evel Control	s (VCAs). If
									_ ( =)
		ine Emp	er+ co	nnecuon is io	st, then the lev	er indut is se	HIO OIT.		

### Level Outputs 1..8

This tab configures the 8 level outputs:

> Audio Input         Level 1         PPOI_OUT         Out         LVL_SPK.Gain Out           > Audio Output         Level 2         Out         Out           Balance Control         Level 3         Out         Out           > Conf Bus         Out         Level 4         Out           > Connext         Level 5         Out         Out           Element State         Level 5         Out         Out           > EmöER+ Hernal FuncCall         Level 7         Out         Out	
Audio Out Only         Level 2         Out           Balance Control         Level 2         Out           Conf Bus         Out         Out           Connext         Level 4         Out           Element State         Level 5         Out           ✓ * Desk         Level 6         Out	
Balance Control         Level 3         Out           Conf Bus         Out         Out           Connect         Level 4         Out           Element State         Level 5         Out           ✓ *De8k         Level 6         Out           > Em8ER+GPIO         Level 7         Out	
> ConfBus         Level 3         Out           > Connect         0ut         Out           Element State         Level 4         Out           < EnBER+         Level 5         Out           > EnBER+GPIO         Level 7         Out	
> Connect         Level 4         Out           Element State         Level 5         Out           ✓ EmBER +         Level 6         Out           > EmBER + GPIO         Level 7         Out	
Element State         Level 5         Out           < EmBER +         Level 6         Out           > EmBER+GPIO         Level 7         Out	
✓ EmBER+ OP(O)	
> EmBER + Internal FuncCall	
> EmBER + Matrix Audio-Matrix Level 8 Out	
> EmBER + Orban CODEC CODEC1	
> EmBER+SrcRepl SrcRepSap1	
> EmBER+V_pro8 GPI GPI	

Assign the <u>Level Control</u> which will adjust the output. When using this function, it is recommended that the participating Ember+ Providers be assigned a <u>Task Priority</u> =
Highest.



### Ember+ Naming

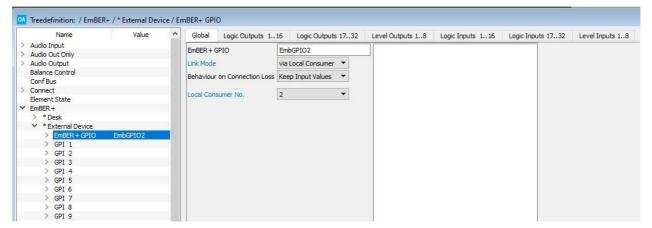
For Ember+ GPIO elements, the Reference Names used by the provider and consumer must match.

In the example below, both the providing and consuming device have been configured with an **Ember+ GPIO** element named **EmbGPIO1**. This allows the 32 GPIs and GPOs to correspond:

Ember+ Provi	der nBER+ / * Desk / EmB		10					
Name	Value	A	Global	Logic Outputs 116	Logic Outputs 1732	Level Outputs 18	Logic Inputs 116	
Audio Input								-
Audio Out Only			GPI 1	Red Light				
Audio Output			GPI 2					
Balance Control			GPI 3					
Conf Bus						-		
Connect			GPI 4					
Element State			GPI 5					
EmBER+			GPI 6			-		
* Desk EmBER + GPI	O EmbGPIO1	_	GPI 6			_		
> GPI 1	Red Light		GPI 7					
> GPI 1 > GPI 2	Realight		GPI 8					
> GPI 2 > GPI 3						-		
> GPI 4			GPI 9					
> GPI 5			GPI 10					
> GPI 6			GPI 11			-		
> GPI 7		~	GFIII					
Ember+ Cons		ER+ GPI	O = EmbG	PIO1				
Name	Value	^	Global	Logic Outputs 116	Logic Outputs 1732	Level Outputs 18	Logic Inputs 116	Logic In
Audio Input			GPO 1	Remote Red I	iaht	out	REDLIGHT.Key	
Audio Out Only			1	Remote Red I	agint	-	Rebelonnikey	
Audio Output		_	GPO 2			Out		
Balance Control			GPO 3			Out		
Conf Bus			GPO 4			-		
Connect Element State			1			Out		
Element State EmBER +			GPO 5			Out		
✓ *Desk			GPO 6			Out		
> EmBER + GPIC	D EmbGPIO1		GPO 7			Out		
> GPI 1 > GPI 2			GPO 8			Out		
> GPI 2 > GPI 3								

### **Naming Multiple Elements**

If you wish to insert multiple **Ember+ GPIO** elements (in order to control more than 32 GPIOs), then insert each element under a different group name. This will allow you to easily distinguish the different sets of GPIOs:



If you do not use different group names, then all the GPIs and GPOs appear in chronological order.



### 3.5.2 Ember+ Internal FuncCall

#### "Ember+ -> Ember+ Internal FuncCall"

This element triggers an Ember+ Function Call. The available functions and their transfer parameters are listed in the Ember+ Provider Tree -> Function Calls.

Each Function Call is triggered by a logical control input and runs on a specific Ember+ parameter path (defined in the **Abs. Function Path** field). Up to five parameter values can be transferred. The transfer results can then be displayed in any Label field - for example, using an MF Key label or VisTool box element.

### **Global Parameters**

		Name		Value	Global				
>	Audio Input	t					10		P
>	Audio Out (	Dnly			EMBER+1	ite	rnal Fu	IncCall	RampFader PC0_5.3s
>	Audio Outp	ut			Abs. Funct	ior	Path		1.5.2
	Balance Co	ntrol			Trigger				RAMP Fader PC 0 5s.Key
>	Conf Bus				mggei				KAMPT duel PC 0_05.Key
>	Connect								
	Element Sta	ate			Parameter	1:	Va	alue	PC
~	EmBER+				Parameter	2.	V	alue	0
	✓ *Desk					-			
	✓ Em	BER + Internal Fun			Parameter	3:	Va	alue	5.3
		Abs. Function Pa	th	1.5.2	Parameter	4:	Va	alue	
		Trigger		RAMP Fade					
		Parameter 1:		PC	Parameter	5:	Va	alue	
		Result 1 (Val.Strin							
		Parameter 2:	Value	0					
		Result 2 (Val.Strin							
		Parameter 3:		5.3					
		Result 3 (Val.Strin							
		Parameter 4:	Value						
		Result 4 (Val.Strir							
			Value						
		Result 5 (Val.Strin	ng)						
1	GP Sum								
>	GPI/O								

Internal FuncCall	Reference name for the element.					
Abs. Function Path	Defines the Ember+ Function Call path.					
Trigger	Assigns an input control signal to trigger the Function Call.					
Parameter 1 to 5: Value	Enter up to five parameter values to be transferred. All parameter values are taken as strings. The order of the values must match that of the Ember+ Provider. You can check this using an Ember+ viewer. In the example above, a Fader ramp for the Source labeled "PC" with a duration of "5.3" seconds and a target Gain of "0"dB will be triggered.					



The available functions can also be identified using an Ember Viewer or VisTool. In the example below, the correct **Abs. Function Path** syntax is indicated in red: **1.5.2** (sapphire.Functions.Ramp Motor Fader). The available parameter values are indicated in yellow (Source Name), green (Gain) and turquoise (Time). These must be entered in the correct order in the 'Tree Definition' as Parameter Values 1, 2 and 3.

▲         •         192.168.101.241:9001         ▲           ▲         ●         001         Sapphire           ▲         ●         001         Sources           ▶         ●         005         Mic1           ▶         ●         005         FIG           ▶         ●         007         MD           ▶         ●         005         S5.1           ▶         ●         010         S5.1+2           ▶         ●         011         VCA1	eep-Alive 🤛 Show Descriptions in Tree
▲       ● 192.168.101.241:9001       ▲         ▲       ● 001 Sapphire         ▲       ● 001 Sources         ▶       ● 005 Mic1         ▶       ● 005 Mic1         ▶       ● 005 Mic1         ▶       ● 005 S5.1         ▶       ● 008 S5.1         ▶       ● 019 S5.1+2         ▶       ● 011 VCA1         ▶       ● 015 Jade         ▶       ● 015 Prools         ▲       ● 019 Prools	
	Contents
	Tag     Field     Type     Value       C-0     Identifier     UTF8     RampMotorFader       C-2     Arguments     Sequence     ▼       C-3     Result     Sequence     ▼       Source Name(UTF8)     Important Sequence     ▼       Result:     Result:     Result:       Result:     Result:     Result:

The results of the function call can be assigned to any Label field in the usual manner - in the example below, the result for Value 1 has been assigned to the **Label ID** of **MF Key 1**. Note that the Label may be used for debugging purposes in the implementation phase. In normal operation it does not need to be configured:

Keys 18	Keys 916	Keys 1724	Keys 2532	Keys 334	0 Keys 4148	Keys 4956	Keys 5764	General	
MF 1	FuncCa	ll Result							
Default Label L	.ine 1 ß			La	abel ID ImpFader PC	0_5.3s.Result 1	(Val.String)		
Default Label L	Line 2 B								
P1 Color	📃 gre	en	•	Low 🔽	Blink 🗖		Lo	gic TRUE.Out	
P2 Color	📃 yel	ow	•	Low 🗖	Blink 🗔		Lo	gic .	
P3 Color	red		•	Low 🗖	Blink 🗖		Lo	igic	
P4 Color	bla	-k	-	Low T	Blink		Ic	gic	

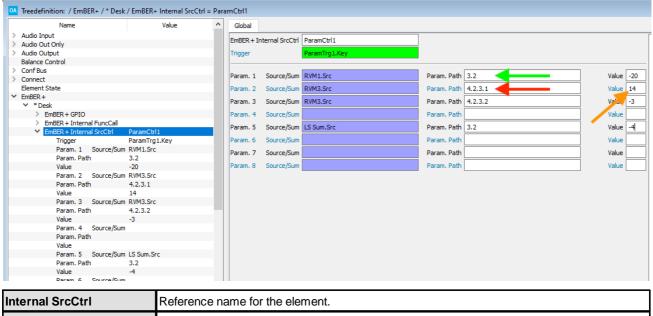


## 3.5.3 Ember+ Internal Src Control

#### "Ember+ -> Ember+ Internal SrcCtrl"

This element element allows up to 8 source or summing bus Ember+ parameter values to be triggered by a local control signal such as an MF Key. For example, to change a series of parameters for a single source, or the same parameter (e.g. fader level) across a range of sources.

#### **Global Parameters**

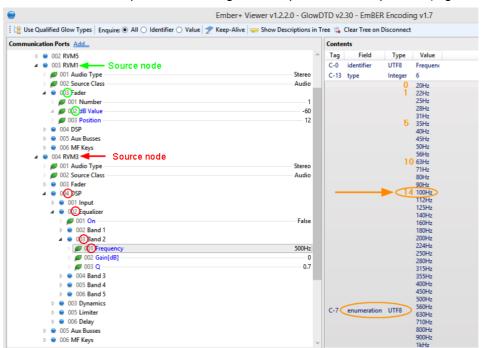


Param Path & Value	Enter the parameter path and value. The values are set when the <b>Trigger</b> signal is true.
Param x	Assign each source or summing bus you wish to adjust.
Trigger	Assigns an input control signal to trigger the parameter values.
Internal SrcCtrl	Reference name for the element.

Use an Ember+ Internal Src Query to report back the status of a parameter path.



The **Param Path** and **Value** fields can be identified using an Ember Viewer as shown below. In our example, the **Param Paths** for the **RVM1** and **RVM3** sources are indicated in green and red, and the **Value** for **RVM3** in orange - for parameters such as frequencies, an integer value specifies the list position (e.g. **14** = 100Hz):





### 3.5.4 Ember+ Internal Src Query

#### "Ember+ -> Ember+ Internal SrcQuery"

This element allows you to query the value of a specific Ember+ parameter path. It can be used to report back the status of a parameter value to the operator - for example, to light an MF Key or VisTool indicator if a value exceeds a certain threshold, or is on (or off).

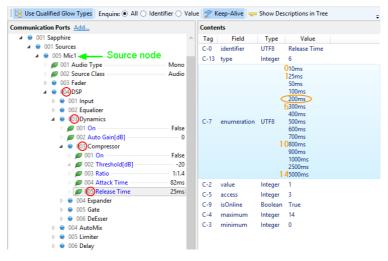
For each element (parameter path), up to four conditions can be compared using equal to (=), greater than (>) or lesser than (<). Each **active** condition produces a **true** and **false** output.

#### **Global Parameters**

Global			Source Node	EmBER+ Path
EmBER + Inter	rnal SrcQuery	Mic1_Comp_RLS		<b>K</b>
Source/Sum		SRC_MIC 01.Src	Parameter Path 4.3.3.5	
Condition 1:	Parameter Value	< ▼	4	active 🔽
	Parameter Value		4	active 🔽
Condition 3:	Parameter Value	> •	4	active 🔽
				active 🗸

Internal SrcQuery	Reference name for the element.					
Source/Sum	Assign the source or summing bus you wish to interrogate.					
Parameter Path	Enter the parameter path you wish to interrogate.					
Condition 1 to 4: Parameter Value	Enter the parameter values and logical conditions you wish to interrogate - you may run up to four individual queries. For each query, select the logic from the drop-down menu (=. >, <), enter the parameter value and tick the active checkbox. Note that the query must be ticked as active to produce a 'Tree Selection' output.					
	In our example, if the Compressor Release Time is less than 4, <b>Condition 1</b> = true; if the Release Time = 4, <b>Condition 2</b> = true, and so on. (In our example, the value of 4 = 200ms according to the <u>Ember+ Enumerations</u> table.)					

The **Param Path** and **Value** fields can be identified using an Ember Viewer as shown below. In our example, the **Param Path** for the **Mic1** source is indicated in green/red, and the **Values** in orange - for parameters such as release time, an integer value specifies the list position (e.g. 4 = 200ms):





The **true** and **false** outputs for each active **Condition** can be found in the "Logic -> Ember+ Internal SrcQuery" branch of the 'Tree Selection' window. These can be used to trigger another element - for example, to light the lamp of an MF Key:

Le Treeselection	?	×	OA Paramete	er: Key Extensio	n Module (Adr.	11)						
EmBER +		^	Keys 17	Keys 814	Keys 1521	Keys 2228	Keys 2935	Keys 3642	Keys 4349	Keys 5056	Module	
> GPI/O		_	MF 29	CRelease								
Logic     * AES Sources					-			_	_			
> * ALS Sources > * Aux Bus		_	P1 Color	gree	n 🔻		Low		Blink 🔽	Logic	Mic1_Comp_RLS	Condition 1 true
✓ * Desk			P2 Color	gree	n 🔻		Low		Blink 🗌	Logic I	Mic1 Comp RLS	Condition 2 true
<ul> <li>EmBER + Internal SrcOuery</li> </ul>	Mic1 Comp RLS		P3 Color	vello			Low	<b>—</b>	Blink	Logic	Mict Comp DLC	.Condition 3 true
Condition 1 true	hier_comp_res	_			w .							
Condition 1 false			P4 Color	red	•	•	Low		Blink 🗖		Mic1_Comp_RLS	Condition 4 true
Condition 2 true			P5 Color	black			Low	E	Blink	Logic		
Condition 2 false			P6 Color	black			Low	<b>—</b>	Blink	Logic		
Condition 3 true												
Condition 3 false			P7 Color	black	•	•	Low		Blink 🗖	Logic		
Condition 4 true			P8 Color	black	•		Low		Blink	Logic		
Condition 4 false												
EmBER + Matrix EmBER + Orban CODEC	Audio-Matrix CODEC1	_	MF 30									
<ul> <li>EmBER + SrcRepl</li> </ul>	SrcRepSap1		MF 30									
> EmBER + V pro8 GPI	GPI		P1 Color	black	. 🔻		Low		Blink 🔽	Logic		
> * Extension Module	UT1		P2 Color	black			Low	E	Blink 🗔	Logic		
> * Global				black			Low		Blink			
> * Headphones			P3 Color							Logic		
> * Hybrids			P4 Color	black	. •		Low		Blink	Logic		
* Line Sources			P5 Color	black			Low	E	Blink	Logic		
> * Main Bus									Blink			
> * Microphones			P6 Color	black			Low			Logic		
> * Monitoring		_	P7 Color	black		·	Low		Blink 🗌	Logic		
* Off Air Record * Off Air Record Bus Assignment		~	P8 Color	black			Low	Г	Blink	Logic		
7 Off Air Record Bus Assignment		· ·	0.000	Diaco			Low		Contrast of	Logic		
	OK (	Cancel										



## 3.5.5 Ember+ Matrix

The **Ember+ Matrix** element allows an Ember+ consumer to control crosspoints within an Ember+ provider. The element does not control any crosspoints directly, but is referenced from other elements including a <u>Matrix Connect</u>, <u>Matrix Multi Connect</u> and <u>Matrix Query</u>.

There are three parts to the configuration. First, define the system to be an <u>Ember+ Consumer</u> (in the "System -> Definition -> Parameter = Local Consumers"). Then define an **Ember+ Matrix** element as described below. Then, on the Ember+ provider, publish the matrix you wish to control.

#### Ember+ Matrix Parameters (on the Consumer)

On the consuming device, add an Ember+ Matrix element to the "Ember+" branch of the 'Tree Definition':

Name	'alue	Global		
Audio Input	' I			]
Audio Out Only		EmBER + Matrix	Audio-Matrix	
> Audio Output		Matrix No.	2 🔻	
Balance Control		Local Consumer No.	2 🔻	
Conf Bus		Local Consumer No.	2 .	
Connect		Matrix Type	V-pro8	
Element State		Matrix Name	Audio-Matrix	
EmBER+				
✓ *Desk				
EmBER + Internal FuncCall				
<ul> <li>EmBER + Matrix</li> </ul>	A			
Matrix No.	2			
Local Consumer No. 2				
Matrix Type	4			
Matrix Name	A			
EmBER + connected				
EmBER + collect completed				
EmBER + init sequence completed				

EmBER+ Matrix	Reference name for the element.				
Matrix Nr	Assign a number to the matrix - this will be referenced from the controlling element (e.g. from a <u>Matrix Connect</u> ).				
Local Consumer Nr	Assign the Local Consumer <u>number</u> you wish to use (as defined under "System -> Definition > Parameter = Local Consumers").				
Matrix Type	Select the external matrix type you wish to control: • Nova17 - for sapphire, sapphire compact, crystal or Nova17. • Nova29 • Nova73 • Vpro8 • BFE - for BFE KSC Core Matrix.				
Matrix Name	The name will reference to the <b>Ember+ Name</b> defined in the "System -> Definition -> Parameter = Matrix Ember+ element on the providing device (described below).				

#### **Ember+ Matrix Parameters (on the Provider)**

On the providing device, open the "System -> Definition -> Parameter = Matrix Ember+" branch of the 'Tree Definition:

Parameter Matrix Snc     Parameter Matrix Snc     Parameter Local Con     Parameter Local Con     Parameter Local Prov     Parameter Descriptio	Parameter         Matrix EmbER+           sumers         Internal Matrix         Local Provider No.           ders         EmpRes Name         Sucham Matrix						
Parameter	Matrix Ember+ – reference name for the element.						
Local Provider Nr	Sets the Local Provider <u>number</u> (defined under "System -> Definition -> Parameter = Local Providers").						
Ember+ Name	This option allows a local matrix to be controlled by an Ember+ consumer. The name must match the <b>Matrix Name</b> defined in the "Ember+ Matrix "element on the consuming device (described above).						



## 3.5.6 Ember+ Orban CODEC

This element can be used to control simple call operations within an Orban CODEC device. Please visit the Orban website for more details on the third-party device.

There are two parts to the configuration. First, define the system to be an <u>Ember+ Consumer</u> (in the "System -> Definition -> Parameter = Local Consumers"). Then define an **Ember+ Orban CODEC** element as described below.

### **Global Parameters**

OA			Tre	eedefinition:	/ EmBER+ / * G	lobal / EmBER	+ Orban CODEC = CODEC 1	×
	Name	Value	Global					
> Audio	Input		EmBER+ O	rban CODEC	CODEC 1			
> Audio	Output							
> Conf B	us		CODEC No.	•	1	<b>•</b>		
> Conne	ct		Local Cons	umer No.	1	-		
EmBER	<b>(</b> +							
× *	Global		Accept Inc	oming Call				
>	EmBER+ Orban CODEC		1 1	-				
>	EmBER+ Orban CODEC	CODEC 2	Disconnect					
>	EmBER+ RAVENNA	RAVEN						
>	EmBER+ R3LAY (Jade)	R3LAY						
GP Sur	m							
> GPI/O								

EmBER+ Orban CODEC	Reference name for the element.
CODEC No.	Assign a number to the CODEC (from 1 to 5). This number must be unique.
Local Consumer Nr	Assign the Local Consumer <u>number</u> you wish to use (as defined under "System -> Definition - > Parameter = Local Consumers").
Accept Incoming Call	Assign an input control signal to accept the incoming call (within the Orban CODEC).
Disconnect	Assign an input control signal to disconnect the call (within the Orban CODEC).



## 3.5.7 Ember+ R3LAY

This element can be used to control functions within Lawo's R3LAY software (formerly known as JADE). Please visit the <u>Lawo</u> website for more details on R3LAY.

There are two parts to the configuration. First, define the system to be an <u>Ember+ Consumer</u> (in the "System -> Definition -> Parameter = Local Consumers"). Then define an **Ember+ R3LAY** element as described below.

### **Global Parameters**

	A	Treedefinition: / EmBER+ / * Global / EmBER+ R3LAY (Jade) = R3LAY	×
	Name Value	Global Streams 132 Streams 3364 Streams 6596	
	Audio Input	EmBER+ R3LAY (Jade) R3LAY	
>	Audio Output		
>	Conf Bus	R3LAY No. 1 V	
>	Connect	Local Consumer No. 3 👻	
$\sim$	EmBER+		
	✓ * Global	ClipIn	
	> EmBER+ Orban CODEC CODEC 1		
	> EmBER+ Orban CODEC CODEC 2	TimeStamp	
	> EmBER+ RAVENNA RAVEN		
	> EmBER+ R3LAY (Jade) R3LAY		
	GP Sum		
>	GPI/O		

EmBER+ R3LAY	Reference name for the element.
R3LAY No.	Assign a number to the R3LAY application (from 1 to 5). This number must be unique.
Local Consumer Nr	Assign the Local Consumer <u>number</u> you wish to use (as defined under "System -> Definition - > Parameter = Local Consumers").
ClipIn	Assign an input control signal to trigger the "ClipIn" function (within R3LAY).
TimeStamp	Assign an input control signal to trigger the "TimeStamp" function (within R3LAY).

#### **Stream Parameters**

	AC		I	reedefinition: / En	nBER+ / * Global / Em	nBER+ R3LAY (Jade) = R3LAY	×
	Name	Value	Global	Streams 132	Streams 3364	Streams 6596	
>>>>	Audio Input Audio Output Conf Bus Connect EmBER+ ✓ * Global > EmBER+ Orban CODEC > EmBER+ Orban CODEC > EmBER+ RAVENNA > EmBER+ R3LAY (Jade) GP Sum GPI/O GPI/O Network	CODEC 2 RAVEN	Select 1 Select 2 Select 3 Select 4 Select 5 Select 6 Select 7 Select 8 Select 9				
>	Level Control		Select 10				
Se	elect x	ļ	Assign an	input control	signal to sele	ct the corresponding stream (within R3L	AY).



## 3.5.8 Ember+ RAVENNA

In crystal, sapphire compact and sapphire MK2 systems, this element can be used to publish RAVENNA parameters to the network .

Note that, in **Power Core**, RAVENNA parameters are published via the <u>Control Settings</u> in the "System -> Definition".

There are two parts to the configuration. First, define the system to be an <u>Ember+ Consumer</u> (in the "System -> Definition -> Parameter = Local Consumers"). Then define an **Ember+ RAVENNA** element as described below

#### **Global Parameters**

	AC		т	reedefinitio	n: / EmBER	+ / * Global / EmBER+ RAVENNA =	= RAVENNA			×
	Name	Value	Global							
>	Audio Input		EmBER+ R	AVENNA		RAVENNA	]			
	Audio Output Conf Bus		Element No	D.		1 👻	-			
5	Connect		Local Cons	umer No.		4 🔻				
~										
	✓ * Global		mDNS Cha	nnel 2:	IP Address	224.0.0.252	Port Number	5354	Enable 🔽	
	EmBER+ Orban CODEC C EmBER+ Orban CODEC C		mDNS Cha	nnel 3:	IP Address		Port Number		Enable 🗌	
	> EmBER+ RAVENNA R	AVEN	mDNS Cha	nnel 4:	IP Address		Port Number		Enable 🗌	
	> EmBER+ R3LAY (Jade) R	3LAY	SAP Chann	nel 2:	IP Address	239.255.255.255	Port Number	9876	Enable 🔽	
>	GP Sum GPI/O		SAP Chann	nel 3:	IP Address		Port Number		Enable 🕅	
	GPI/O Network		SAP Chann	nel 4:	IP Address		Port Number		Enable	
>	Level Control						1			
>	Logic									
>	MF Key									
	Minimix									

EmBER+ RAVENNA	Reference name for the element.				
Element No. Assign a number to the RAVENNA element (from 1 to 6). This number must be unique.					
Local Consumer Nr	Assign the Local Consumer <u>number</u> you wish to use (as defined under "System -> Definition -> Parameter = Local Consumers").				

The remaining parameters define the mDNS and SAP channels used for stream announcement:

- mDNS channels use the multicast Domain Name System defined in IETF RFC 6762.
- SAP channels use the Session Announcement Protocol defined in IETC RFC 2974.

For each channel, enter the multicast **IP Address** and **Port Number**. Use the **Enable** checkbox to enable or disable the channel.



## 3.5.9 Ember+ Src Repl

The **Ember+ Src Repl** element can be used to couple a source between an Ember+ provider and consumer. Once replicated, all selected parameters will operate in parallel. The replication can be either one-way or bidirectional. If bi-directional, then if a parameter is altered on one side, the same change is applied on the opposing side. Note that the source types do not have to match. So, for example, a mono source could be replicated to a stereo or 5.1 source; in this instance only parameters which match will be coupled.

The replication can affect the following source parameters (according to the options selected in the consumer):

- Fader (sapphire, sapphire compact and ruby)
- INP, excluding mic parameters.
- Other DSP modules: EQ, DYN, LIM, DLY.

To use this feature, there are three parts to the configuration. First, on the consuming device, add an **Ember+ Src Repl** element to the "**EmBER+**" branch of the 'Tree Definition'. A single element can be used to replicate several sources from the same consumer. If you wish to replicate sources to more than one provider, then add one **Ember+ Src Repl** element for each provider. Next, define the **Source** parameters on the Ember+ consumer. Finally, define the **Source** parameters on the Ember+ provider.

Note that:

- The use of source replication may slow down the system. See Managing the Network Traffic.
- When using Source Replication, it is recommended that the participating Ember+ providers are assigned a <u>Task Priority</u> = **Highest**.
- For bi-directional control you must enable the <u>subscript reports</u> on the Ember+ provider.
- To reduce the volume of network traffic, you can configure uni-directional control by disabling the <u>subscript reports</u> on the Ember+ provider.
- Take care not to create a coupling loop for example, by configuring two parallel Consumer/Provider paths to the same source!



## **Ember+ SrcRepl Parameters**

Name	Value	Global		
Audio Input	Value	Giobai		
Audio Input     Audio Out Only		EmBER + SrcRepl	SrcRepSap1	Source replication to Sapphire 1
Audio Output		SrcRepl Element No.	1	
Balance Control			-	
Conf Bus		Local Consumer No.	2 🔻	
Connect		Enable Replication		
Element State		Replication Consumer -> Provi	der 🗹	
EmBER+				
⊿ *Desk		Replication Provider -> Consur	mer 🔽	
EmBER + SrcRept SrcRept	oSap1	Initial Replication Direction	Provider -> Consum 🔻	
* External Sources				
GP Sum		Fader included	<b>V</b>	
GPI/O		Input included	<b>v</b>	
GPI/O Network		Equalizer included	<b>v</b>	
Hidden		Equalizer included	-	
Label		Dynamics included	$\checkmark$	
Level Control		Automix included	<b>V</b>	
Logic				
<ul> <li>MF Key</li> <li>Minimix</li> </ul>		Limiter included	,	
Panel		Delay included		
Ravenna Input		Aux Busses included		
<ul> <li>Source</li> </ul>			_	
<ul> <li>Sum Bus</li> </ul>		VCA Group included		

#### on the Ember+ Consumer

Ember+ SrcRepl	Reference name for the element.
SrcRepl Element Nr	Enter a Source Replication element number (e.g. 1). This will be used to identify each source you wish to replicate (described below). The same number can be used to replicate several sources.
Local Consumer Nr	Enter the Local consumer <u>number</u> , as defined in the "System -> Definition -> Parameter = Local Consumers" branch of the 'Tree Definition'.
Enable Replication	Enter a control signal to enable the replication.
Replication Consumer -> Provider Replication Provider -> Consumer	Use these options to determine whether the replication is one-way or bi-directional. Tick both checkboxes for bi-directional replication.
Initial Replication Direction	<ul> <li>This option determines the initial replication direction. It affects what happens after a system restart or interruption to the Ember+ connection. There are three possibilities: Provider -&gt; Consumer, Consumer -&gt; Provider and By Negotiation.</li> <li>If By Negotiation is selected, then the provider and consumer negotiate over who has the most current data. This information is then used to determine the initial replication direction. The negotiation compares whether the provider or consumer have already been replicated during runtime as follows.</li> <li>If no communication has occurred, then the system which started first replicates its parameters to the other system.</li> <li>If communication has occurred and only one of the systems has exchanged parameters, then this system replicates its parameters to the other system.</li> <li>If communication has occurred and both systems have exchanged parameters, then the time stamp of the last exchange decides the replication direction.</li> </ul>
Fader Included, etc.	Use these options to determine which parameters are replicated.





### **Source Parameters**

#### Ember+ Consumer

	Name	Value	^	Parm	PFL	Conf	Down Src	Aux	Aux Switch	Keys
	Audio Input			Source N	1000		SRC MIC 01	D1		
	Audio Out Only				10110			-03		_
	Audio Output			Display			DJ			
	Balance Control			Alias						
	Conf Bus									=
>	Connect			Class			Default			
	Element State			EmBER +	l ocal Pr	ovider No	none		-	
1	EmBER+							_	- 1	
	✓ *Desk			SrcRepl	Element	NO.	1			_
	> EmBER + Internal FuncCall			SrcRepl	Name		Mic 1			
	> EmBER + Matrix	Audio-Matrix		List Enal			~			
	> EmBER + Orban CODEC	CODEC1		USI Eridi	ле					_
	> EmBER + SrcRepl GP Sum	SrcRepSap1		Audio In	put		MIC 01 - DJ.	Inp		
				Lim Op D	icable					
	GPI/O GPI/O Network						-			
	Hidden			Dyn Op I	Disable					
5	Label			Eq Op D	isable					
2	Level Control			DIV Op D			Г			
5	Logic			DIV OP L	Isable		L			
5	MF Key			DeEsser	/ AutoM	ix				
5	Minimix			Matrix Ir	out		0			
	Panel						<u> </u>			
1	Source			Fader O	pen					
	> * AES Sources			Input Mu	ite					
	> * Hybrids									
	> * Line Sources			Fader U	0					
	<ul> <li>* Microphones</li> </ul>			Fader D	own		AND_REC nA	CTVE MI	C01.Out	
	<ul> <li>Source Mono</li> </ul>	SRC_MIC 01 - DJ		Fader To			SRC MIC 01	DIME	2 Kau	
	Display	D1	_	rader to	aggie .		SKC_MIC 01	- DOUMP .	o ney	

	Name	Value	Parm	PFL	Conf	Down Src	Aux	Aux Switch	Keys
>	Audio Input		Source N			SRC MIC 01			_
>	Audio Out Only			iono					
>	Audio Output		Display			Mic 1			
	Balance Control		Alias						
	Conf Bus								-
>	Connect		Class			Default			
	Element State		EmBER +	Local Pr	wider No	1		-	
~	EmBER+								
	✓ * Desk	SrcRepl	lement I	vo.	none		4	_	
	> EmBER + Internal FuncCal	SrcRepH	lame		Mic 1				
	> EmBER + Matrix	Link Could	List Enable						
	> EmBER + Orban CODEC							_	
	> EmBER + SrcRepl GP Sum	Audio In	out		MIC 01 - DJ.	np			
	GPI/O		Lim Op D	isable		Г			
^	GPI/O GPI/O Network						F		
	Hidden		Dyn Op I	Jisable		1.0			
>	Label		Eq Op Di	sable					
s	Level Control		Div Op D	in a la la c		Г			
Ś	Logic								
5	MF Key		DeEsser	/ AutoMi	x	▼			
>	Minimix		Matrix Ir	out		0			
	Panel					-			
~	Source		Fader O	ben					_
	> * AES Sources		Input Mu	Input Mute					
	> * Hybrids	Control 10	Fader Up						
	> *Line Sources								
	<ul> <li>* Microphones</li> </ul>	Fader Do	Fader Down			AND_REC nACTVE MIC01.Out			

#### Ember+ Provider

#### > On the Ember+ consumer:

1. Open the Source element you wish to replicate.

2. Enter a Source Replication element number (highlighted in blue). This *must* match the number defined for the **Ember+ SrcRepl** element. The same number can be assigned to several Sources.

**3.** Enter a Source Replication Name (highlighted in red). This is used to identify the Source in the provider (as described below).

#### On the Ember+ provider:

1. Open the Source element you wish to couple.

2. Set the **Display** name field so that it matches the **SrcRepl Name** entered on the Ember+ consumer (highlighted in red).

**3.** Enter the Local provider <u>number</u> (highlighted in green), as defined in the "System -> Definition -> Parameter = Local Providers" branch of the 'Tree Definition'.



## 3.5.10 Ember+ V\_pro8 GPI

The **Ember+ V\_pro8 GPI** element can be used to control presets within a Lawo V\_pro8. Any one of four V\_pro8 presets (A to D) can be triggered from 8 GPIs. Note that the V\_pro8 must be running Version 1.1.7.24 software or later.

There are two parts to the configuration. First, define the system to be an <u>Ember+ Consumer</u> (in the "System -> Definition -> Parameter = Local Consumers"). Then define an **Ember+ V\_pro8 GPI** element as described below.

### **Global Parameters**

Name	Value	Global GPI
> Audio Input		
> Audio Out Only		EmBER + V_pro8 GPI GPI
> Audio Output		V_pro8 No. 1 🔻
Balance Control		Local Consumer No. 5
> Conf Bus		Local Consumer No. 5
> Connect		
Element State		
EmBER +		
✓ * Desk		
> EmBER + Internal FuncCa	1	
EmBER + Matrix	Audio-Matrix	
EmBER + Orban CODEC	CODEC1	
> EmBER + SrcRepl	SrcRepSap1	
EmBER + V pro8 GPI	GPI	
CD 0		

EmBER+ V_pro8 GPI	Reference name for the element.
V_pro8 Nr	Assign a number to the V_pro8 unit (from 1 to 5). This number must be unique.
	Assign the Local Consumer <u>number</u> you wish to use (as defined under "System -> Definition - > Parameter = Local Consumers").

### **GPI Parameters**

Select this tab to define the GPIs and presets:

Name	Value	^	Global	GPI				
Audio Input			GPI 1	Setting	Preset A	-	Triager	V_pro8_GPI_1.Key
Audio Out Only			GPII	Setung	Preset A	•	ingger	V_pros_GP1_1.Key
Audio Output			GPI 2	Setting	Preset B	-	Trigger	V_pro8_GPI_2.Key
Balance Control			GPI 3	Setting	Preset C	-	Trigger	V_pro8_GPI_3.Key
Conf Bus				-				
Connect			GPI 4	Setting	Preset D	-	Trigger	V_pro8_GPI_4.Key
Element State			GPI 5	Setting	Preset D	-	Trigger	V_pro8_GPI_5.Key
EmBER+						-		
✓ * Desk			GPI 6	Setting	Preset C	•	Trigger	V_pro8_GPI_6.Key
> EmBER + GPIO			GPI 7	Setting	Preset B	-	Trigger	V_pro8_GPI_7.Key
> EmBER + Internal FuncCall			GPI 8	Setting	Preset A	-	Trioger	V_pro8_GPI_8.Key
> EmBER + Internal SrcCtrl	ParamCtrl1		GFIO	Securig	FIESELA		nigger	V_Dros_GP1_6.Key
<ul> <li>EmBER + Internal SrcQuery</li> <li>EmBER + Matrix</li> </ul>	Mic1_Comp_RLS Audio-Matrix							
<ul> <li>Ember + Matrix</li> <li>EmBER + Orban CODEC</li> </ul>	CODEC1				<b>T</b>			
Ember + Orban Cobec Ember + SrcRepl	SrcRepSap1				· · ·			
EmBER+V pro8 GPI	GPI				•			
V pro8 No.	1	_						
Local Consumer No.	5							
EmBER + connected								
EmBER + collect complete	d							
GPI 1 Setting	1							
Trigger	V_pro8_GPI_1.Key							
GPI 2 Setting	2							
Trigger	V_pro8_GPI_2.Key							
GPI 3 Setting	3							
Trigger	V_pro8_GPI_3.Key							

GPI x Setting	Defines which preset (A to D) will be recalled when the <b>GPI Trigger</b> signal is true.
GPI x Trigger	Assigns an input control signal to trigger the GPI.



The result of an active trigger (e.g. GPI 8) can be viewed in the V\_pro8 browser interface:



The parameter paths and values triggered by the GPIs can also be identified using an Ember+ Viewer:

0       001 Output         0       002 Input         0       003 Madi Out         0       004 Madi In         0       005 Quad         0       005 Quad         0       005 GPI         0       001 GPI 1         0       003 GPI         0       003 GPI         0       001 GPI 1         0       002 Lv         0       003 TR         0       False         0       001 Assign         Setting D       002 Lv         0       False         0       003 TR         0       False         0	4 👳	001 pro8	^	Tag	Field	Туре	Value	
▶ ● 003 Madi Out       C-1 description Otro       Assign         ▶ ● 004 Madi In       C-2 value       Integer 1         ▶ ● 005 Quad       C-3 minimum       Integer 0         ▶ ● 005 Quad       C-4 maximum       Integer 1         ▶ ● 001 GPI 1       C-5 access       Integer 3         ▲ ● 001 GPI 1       Rise       Setting A         ▲ ● 002 Lv       Rise       Rise         ▶ ● 003 Madi Out       Setting B         ▲ ● 002 GPI 2       P       C-7 enumeration         ▶ ● 003 TR       False         ▲ ● 001 Assign       Setting C         ▶ ● 003 TR       False         ▲ ● 001 Assign       Setting C         ▶ ● 003 TR       False         ▲ ● 001 Assign       Setting D         ▶ ● 003 TR       False         ▲ ● 001 Assign       Setting D         ▶ ● 003 TR       False         ▲ ● 004 GPI 4       P         ▶ ● 003 TR       False         ▲ ● 005 GPI 5       P         ▶ ● 003 TR       False         ▲ ● 005 GPI 6       P         ▶ ● 003 TR       False         ▲ ● 005 GPI 6       P         ▶ ● 003 TR       False         ▶ ● 003	₽			C-0	identifier	UTF8	Assign	
□       004 Madi In         □       005 Quad         □       005 Quad         □       006 Misc         □       007 identity         □       008 GPI         □       001 GPI 1         □       001 GPI 1         □       002 Lv         □       001 Assign         □       002 Lv         □       001 Assign         □       002 Lv         □       001 Assign         □       002 Lv         □       001 Assign	Þ			C-1	description	UTF8	Assign	
C-3 minimum Integer 0 C-4 maximum Integer 4 C-5 access Integer 3 a 001 GP1 1 a 001 Assign Setting A b 002 Lv Rise b 002 Lv Rise b 003 GP1 3 a 001 Assign Setting C b 002 Lv Rise b 003 GP1 3 a 001 Assign Setting C b 002 Lv Rise b 003 GP1 5 b 002 Lv Rise b 003 TR False a 003 GP1 5 b 001 Assign Setting D b 002 Lv Rise b 003 TR False a 003 GP1 5 b 001 Assign Setting D b 002 Lv Rise b 003 TR False a 003 GP1 5 b 001 Assign Setting D b 002 Lv Rise b 003 TR False a 003 GP1 5 b 001 Assign Setting D b 002 Lv Rise b 003 TR False a 003 GP1 5 b 001 Assign Setting D b 002 Lv Rise b 003 TR False a 003 GP1 5 b 001 Assign Setting D b 002 Lv Rise b 003 TR False c 003 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 003 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 003 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 003 TR False c 003 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 003 TR False c 003 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 000 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 000 GP1 5 c 001 Assign Setting D c 002 Lv Rise c 000 GP1 5 c 000 Lv Rise c 000 GP1 6 c 000 Assign Setting C c 000 GP1 6 c 000				C-2	value	Integer	1	
□       005 Quad         □       006 Misc         □       007 identify         □       008 GPI         □       001 Assign				C-3	minimum	Integer	0	
▶       ●       000 Misc         ▶       ●       007 identity         ▲       ●       001 GP11         ▲       ●       001 Assign         ▶       ●       001 Assign         ▶       ●       002 Lv         ▶       ●       001 Assign         ▶       ●       002 Lv         ▶       ●       003 TR         ▶       ●       001 Assign         ▶       <				C-4		-		
<ul> <li>a considered with the second second</li></ul>						-		
<ul> <li>© 001 GPI 1</li> <li>© 001 Assign Setting A</li> <li>© 002 Lv Rise</li> <li>© 003 TR False</li> <li>© 001 Assign Setting B</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting C</li> <li>© 001 Assign Setting C</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 003 TR False</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 003 TR False</li> <li>© 003 TR False</li> <li>© 003 TR False</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 003 TR False</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 003 TR False</li> <li>© 003 TR False</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 003 TR False</li> <li>© 003 TR False</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting D</li> <li>© 002 Lv Rise</li> <li>© 001 Assign Setting C</li> <li>© 002 Lv Rise</li> </ul>	₽			100	access	integer		
C-7 enumeration UTF8 Setting B 002 Lv Rise 003 TR False 001 Assign Setting B 001 Assign Setting B 002 Lv Rise 003 GPI 3 001 Assign Setting C 003 CPI 3 001 Assign Setting D 002 Lv Rise 003 TR False 003 GPI 5 001 Assign Setting D 002 Lv Rise 003 TR False 003 TR False 000 OUL V Rise 000 TR False 000 OUL V Rise 000 TR False 000 TR False								
> 002 Lv       Rise       Setting C         > 003 TR       False       Setting D         > 001 Assign       Setting B       Setting D         > 002 GP12       Rise       Rise         > 003 TR       False       Rise         > 003 GP13       Setting C       Rise         > 003 GP13       Setting D       Setting D         > 002 Lv       Rise       001 Assign         > 003 TR       False       Setting D         > 002 Lv       Rise       003 TR         > 003 TR       False       Setting D         > 003 TR       False       Setting C         > 003 TR       False       Setting C         > 003 TR       False       Setting C         > 003 GPI 6       Setting C       Setting C         > 002 Lv       Rise       Setting C				C-7	enumeration	UTF8		
Image: Setting D       Image: Setting D         Image: Setting D		· · · · · · · · · · · · · · · · · · ·						
•       002 GP12         •       001 Assign       Setting B         •       002 Lv       Rise         •       003 TR       False         •       003 GP13       False         •       003 GP13       False         •       003 GP14       False         •       003 TR       False         •       001 Assign       Setting D         •       003 TR       False         •       003 CP16       False         •       001 Assign       Setting C         •       002 Lv       Rise		E					Setting D	
001       Assign       Setting B         002       Lv       Rise         003       TR       False         003       O01       Assign         001       Assign       Setting C         001       Assign       Setting C         002       Lv       Rise         003       TR       False         003       TR       False         004       GP14       GP14         001       Assign       Setting D         003       TR       False         003       TR       False         003       GP15       False         003       TR       False         003       TR       False         003       O2       Lv         Rise       003       TR         False       003       TR         False       003       GP16         001       Assign       Setting C         002       Lv       Rise		E	e					
002 Lv       Rise         003 GPI 3       False         001 Assign       Setting C         001 Assign       Setting C         001 Assign       Setting C         003 GPI 3       Rise         001 Assign       Setting C         003 TR       False         004 GPI 4       P         002 Lv       Rise         003 TR       False         003 TR       False         003 Clv       Rise         003 TR       False         003 GPI 5       P         003 GPI 5       False         003 GPI 6       P         003 TR       False         003 GPI 6       P         001 Assign       Setting C         002 Lv       Rise         002 Lv       Rise								
<sup>1</sup> 003 TR        False <sup>1</sup> 001 Assign        Setting C <sup>1</sup> 001 Assign        Setting C <sup>1</sup> 001 Assign        Setting D <sup>1</sup> 001 Assign        Setting D <sup>1</sup> 001 Assign        Setting D <sup>1</sup> 002 Lv        Rise <sup>1</sup> 003 TR        False <sup>1</sup> 003 TR        Setting D <sup>1</sup> 003 TR <tr< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></tr<>								
			-					
Image: Constraint of the system of the sy		2	-					
002 Lv       Rise         003 TR       False         004 GPI 4       False         000 1 Assign       Setting D         000 002 Lv       Rise         000 003 TR       False         000 GPI 5       False         000 003 TR       False         000 000 Cv       Rise         000 000 TR       False         000 000 GPI 6       False         000 001 Assign       Setting C         000 001 Assign       Setting C         000 002 Lv       Rise			-					
>       003 TR       False         >       004 GPI 4         >       >       001 Assign         >       002 Lv       Rise         >       003 TR       False         >       003 TR       False         >       003 TR       False         >       003 TR       False         >       001 Assign       Setting D         >       001 Assign       Setting C         >       001 Assign       Setting C         >       001 Lv       Rise								
<ul> <li>▲ ● 004 GPI 4         <ul> <li>▶ ● 001 Assign Setting D</li> <li>▶ ● 002 Lv</li> <li>■ Rise</li> <li>▶ ● 003 TR</li> <li>■ False</li> <li>▲ ● 005 GPI 5</li> <li>▶ ● 001 Assign Setting D</li> <li>▶ ● 003 TR</li> <li>■ Goi TR</li> <li>■ False</li> <li>▲ ● 005 GPI 6</li> <li>▶ ● 001 Assign Setting C</li> <li>▶ ● 002 Lv</li> <li>■ 001 Assign Setting C</li> <li>▶ ● 002 Lv</li> <li>■ 002 Lv</li> <li>■ 001 Assign Setting C</li> <li>▶ ● 002 Lv</li> <li>■ 002 Lv</li> <li>■ 002 Lv</li> <li>■ 002 Lv</li> <li>■ 001 Assign Setting C</li> <li>▶ ● 002 Lv</li> <li>■ 001 Assign Setting C</li> <li>■ 002 Lv</li> <li>■ 001 Assign Not Not Not Not Not Not Not Not Not Not</li></ul></li></ul>			-					
001       Assign       Setting D         002       Lv       Rise         003       TR       False         005       GP1 5       False         001       Assign       Setting D         002       Lv       Rise         003       TR       False         003       TR       False         003       TR       False         003       TR       Setting D         004       Assign       Setting C         002       Lv       Rise								
▶     002 Lv     Rise       ▶     003 TR     False       ▲     005 GPI 5     Setting D       ▶     001 Assign     Setting D       ▶     002 Lv     Rise       ▶     003 TR     False       ▲     005 GPI 6     False       ▶     001 Assign     Setting C       ▶     001 Assign     Setting C       ▶     002 Lv     Rise		🖉 001 Assian Setting						
▲         ●         005 GPI 5           ▶         ●         001 Assign         Setting D           ▶         ●         003 TR         Rise           ▶         ●         003 TR         False           ▲         ●         006 GPI 6         False           ▶         ●         001 Assign         Setting C           ▶         ●         002 Lv         Rise		-						
011         Assign         Setting D           002         Lv         Rise           003         TR         False           006         GP16         False           001         Assign         Setting C           002         Lv         Rise		Ø 003 TR Fals	e					
▶         002 Lv         Rise           ▶         003 TR         False           ▲         ●         006 GPI 6           ▶         Ø 001 Assign         Setting C           ▶         Ø 002 Lv         Rise		🔺 👳 005 GPI 5						
		🖻 💋 001 Assign 🦳 Setting I	0					
		Ø 002 Lv Ris	e					
▷		Ø 003 TR Fals	e					
🛛 💋 002 Lv — Rise		🔺 🔮 006 GPI 6						
E		🖻 💋 001 Assign — Setting 🤅	2					
🖻 🟉 003 TR — 🛛 🖉 False		🖻 💋 002 Lv — Ris	e					
		Ø 003 TR Fals	e					



# 3.6 Ember+ A-stage

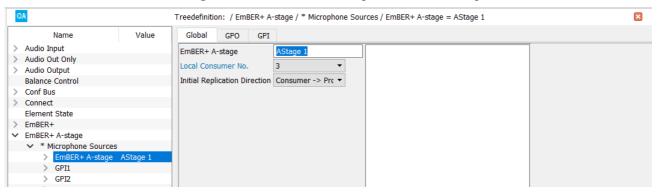
An **Ember+ A-stage** element allows microphone and GPIO parameters within an A\_stage device to be remotely controlled via Ember+. It is supported by Power Core only.

Each element must be assigned to a Local Consumer and, therefore, up to 15 devices can be configured. Each A\_stage device supports up to 32 mic inputs, plus 8 GPIs and 8 GPOs.

The A\_\_stage device must be connected to the Lawo control network and configured separately (via its own interface) to allow Ember+ control.

To configure the Power Core side:

1. Create an Ember+ A-stage element for each A\_stage device, and assign it to a Local Consumer:



- 2. Enter the parameters for the Local Consumer in the <u>usual</u> manner.
- 3. To configure the remote mic amp control:
  - Insert a new Source for the mic input in the usual manner, see Creating Sources.
  - Double-click on the EmBER+ A-stage field to assign the element created in step 1.
  - Use the Channel No. to enter the A\_stage mic input number you wish to control (from 1 to 32).

UA .		Tr	eedefinitio	in: / Sou	urce / * Microp	hone Sou	rces / Source =	SRC_MIC 1		×		
Name	Value	Parm	PFL	Conf	Down Src	Aux	Aux Switch	Keys				
> Audio Input		Source			SRC_MIC 1		Т	ype Mono 👻				
> Audio Out Only								ype mono				
> Audio Output		Display			MIC 1		_					
Balance Control		Alias										
> Conf Bus		Class			Default							
> Connect		EmPERt	Local Provi	idar Na	1	-						
Element State					-	•						
> EmBER+		SrcRepl E	Element No	<b>.</b>	none	-						
> EmBER+ A-stage		EmBER+	A-stage		age 1.A-stage	Referenc	e Channel	Nc. 1				
GP Sum		List Enabl	le		7							
> GPI/O		Audio Inp			CTUDIO MIC	01 7						
GPI/O Network					STUDIO_MIC	.01.1np		La Treeselection			?	$\times$
Hidden		Lim Op D						- neeselection			1	~
Label     Level Control		Dyn Op D	isable					EmBER+ A-stage				
		Eq Op Dis	sable					* Microphone Sources				
Logic     MF Key		Dly Op Di	sable					EmBER+ A-stage	AStage 1			
> Minimix			/ AutoMix		~			A-stage Referen	nce			
Panel					Off	_						
Ravenna Input		RAVENNA			Οπ	-	_					
✓ Source		Fader Lev	vel Sync									
> * AutoMix		Fader Op	en									
> * Digital Sources		Input Mut	te									
> * External Sources		Fader Up										
> * Hybrid Sources												
<ul> <li>* Microphone Source</li> </ul>		Fader Do	wn									
> Source	SRC_MIC 1	Fader To	ggle		SRC_MIC 1.	4F 3 Key						
> Source	SRC_MIC 2	Eader Un	to Last Va	due								
> Source	SRC_MIC 3											
> Source	SRC_MIC 4	Fader To	ggle to Las	st Value								

Once the configuration is in place, the operator can remotely adjust mic input parameters within the A\_stage device by assigning this source to the surface.

4. To configure the remote GPIO control, return to the **Ember+ A-stage** element and define the fields in the GPO and GPI tabs (as described below).



### **Global Parameters**

	A		Treedefini	tion: / Em	BER+ A	A-stage / * Microphone Sources / EmBER+ A-stage = AStage 1	×	
	Name	Value	Global	GPO	GPI	I		
>	Audio Input		EmBER+	A-stage		AStage 1		
	Audio Out Only Audio Output		Local Co	nsumer No		3 •		
	Balance Control		Initial Re	plication D	irection	n Consumer -> Prc 🔻		
>	Conf Bus							
>	Connect							
	Element State							
>	EmBER+							
$\sim$	EmBER+ A-stage							
	<ul> <li>* Microphone Sources</li> </ul>							
	> EmBER+ A-stage /	AStage 1						
	> GPI1							
	> GPI2							
Er	nber+ A-stage		Enter a	Refere	nce i	name for the element/device		
Lo	ocal Consumer No.		Enter the <u>number</u> of the Ember+ Consumer you wish to use (as defined under "System -> Definition -> Parameter = Local Consumers").					
Ini	tial Replication Dir	ection		This option determines the initial replication direction following a restart. The default direction <b>Consumer -&gt; Provider</b> ) will read the values from the Astage device.				

### GPI

These tabs configure the 8 GP inputs:

C	A		Treedefinition	n: / En	nBER+ A-stage	/ * Microphone Sources / EmBER+ A-stage = AStage 1	×
	Name	Value	Global	GPO	GPI		
>	Audio Input Audio Out Only		GPI1		Red Light		
>	Audio Out Only Audio Output		GPI2				
>	Conf Bus		GPI3				
>	Connect EmBER+		GPI4				
~	EmBER+ A-stage		GPI5				
	<ul> <li>Microphone Sources</li> <li>EmBER+ A-stage</li> </ul>		GPI6 GPI7				
	> GPI1	Red Light	GP17 GP18				
	> GPI2 > GPI3			I			
	> GPI4						
	> GPI5						
GI	기 x		Reference	ce na	me for th	e input. This can be any name - e.g. Red Light.	
	GPIs 1 to 8 will correspond to GPOs 1 to 8 within the mirroring device, providing that bot sides have an identical Reference Name.				h		



## GPO

## These tabs configures the 8 GP outputs:

OA	Treedefinition: / E	EmBER+ A-stage / * Microphone Sources / EmBER+ A-stage = AStage 1				
Name Value	Global GPC	O GPI				
> Audio Input	GP01	Remote Red Light				
> Audio Out Only						
> Audio Output	GPO1	Red Light.Key				
> Conf Bus		Treeselection ? X				
> Connect	GPO2					
> EmBER+	GPO2	EmBER+				
<ul> <li>EmBER+ A-stage</li> </ul>	Groz	GPI/O				
<ul> <li>* Microphone Sources</li> </ul>		Logic				
EmBER+ A-stage AStage 1	GPO3	MF Key				
> GPI1	GPO3	* Microphone Sources				
> GPI2		Green Button RGB Module 1 (Adr. 1)				
> GPI3	6004	Red Light				
> GPI4	GPO4	Key Key				
> GPI5	GPO4	Panel				
> GPI6		Surface				
> GPI7	GPO5					
> GP18						
> GPO1 Remote Red	GPO5					
> GP02						
> GP03	GPO6					
> GP04	GPO6					
> GP05	di ou					
> GP06						
> GP07	GP07					
> GP08	GPO7					
GP Sum						
> GPI/O	6000					
GPI/O Network	GPO8					
> Label	GPO8					
> Level Control						
1 Logic						
GPO x	Refe	erence name for the output.				
		Os 1 to 8 will correspond to GPIs 1 to 8 within the mirroring device, providing that both as have an identical Reference Name.				
Out		Assign an input control signal to trigger the GPO - in our example, the console's Red Light MF Key.				



# 3.7 GP Sum

A GP Sum (General Purpose Summing bus) is a summing bus which cannot be allocated DSP or fader strip control. They are ideal for applications such as a talkback or AFL.

A source assigned to the control surface can be connected or disconnected from the sum, either pre or post fader, via control signals created using the <u>Connect -> Mix Remote</u> element. The level from the source to the bus can also be controlled or preconfigured.

## 3.7.1 Creating GP Sum Buses

A GP Sum can be inserted under the "**GP Sum**" branch of the 'Tree Definition'. Once named, the bus can be linked to other elements in the configuration.



# 3.8 GPI/O

The "GPI/O" branch of the 'Tree Definition' provides access to the physical GPIO and GPIO-over-Audio (GT) signals.

The same parameters can be accessed by double-clicking on a connector in the 'Frame -> System Core'. Parameters can also be edited in list form by selecting 'Command -> Inputs' or 'Command -> Outputs'.

## 3.8.1 GPI & GPO

GPI Parameters						
AO		Parameter: GPIO Port GPIO Slot				
GPI GPO						
GPI 1 Como	d Räuspern	Neg 🗔				
GPI 2 Gast	Räuspern	Neg 🗖				
GPI 3 Gast	Räuspern	Neg 🗔				
GPI 4		Neg 🗖				
GPI 5		Neg 🗔				
GPI 6		Neg 🗖				
GPI 7		Neg 🗔				
GPI 8		Neg 🗖				

GPO Parameters						
AO		Parameter: GPIO Port GPIO Slot				
GPI GPO						
GPO 1	Mod Rot					
Pulsetime (1/10 sec)		Pulse Enable				
Select Logic	Mod Rot.Out					
GPO 2	Comod Rot					
Pulsetime (1/10 sec)		Pulse Enable				
Select Logic	Co Rot.Out					
GPO 3	Gast1 Rot					
Pulsetime (1/10 sec)		Pulse Enable				
Select Logic	Gast 1 Rot.Out					
GPO 4	Gast2 Rot					
Pulsetime (1/10 sec)		Pulse Enable				
Select Logic	Gast 2 Rot.Out					

#### **GPI Parameters**

GPI N	Reference name for the GPI input.
Neg	Select this checkbox if you wish the GPI input to be negated (inverted).

#### **GPO Parameters**

GPO N	Reference name for the GPI output.
	Enter the duration of the output pulse in steps of 1/10 second. For example, enter 2 for an approximate pulse length of 0.2 seconds.
Pulse Enable	Select this checkbox to enable output pulse switching.
Select Logic	The output pulse will be triggered by the rising edge of the control signal entered in this field.

Each input and output can be assigned to other elements within the configuration via the "GPI/O" branch of the 'Tree Selection'.



## 3.8.2 GPIO over Audio channels (GT In/Out)

**GPIO-over-Audio**, also known as **GT In/Out**, works by exchanging GPIO signals across a Digital Audio link. The physical audio link must be either MADI or AES3, and must not use sample rate conversion (otherwise the GPIO data will get scrambled). Inputs and outputs assigned to GT signals must be set to Transparent mode. Also, due to the processing required, changes of logical states must not be faster than 100ms.

**GT In/Out** elements can be added to the "**GPI/O**" branch of the 'Tree Definition'. Each element supports 64 GT channels, each of which can transmit 8 GPIO-bits.

#### GT In 1 to 64 Parameters

	In 1 = Nova17Signalli	_					
Name	Value	^	GT In	GT Out			
Audio Input			GT In 1		Nova 17Signalling	Matrix enable OFF	
Audio Out Only							
Audio Output			Audio		D_IN0093.Inp		
Balance Control							
Conf Bus			GT In 2			Matrix enable OFF	
Connect							
Element State			Audio				
EmBER +							
GP Sum			GT In 3			Matrix enable OFF 👻	
GPI/O						Madix endule OFF	
> GP I/O (945/05) Slot 17			Audio				
✓ GT 1		_					
> GT In 1 Nova 17Si	gnalling		GT In 4		[	Matrix enable OFF 👻	
> GT In 2			GI IN 4			Matrix enable OFF	
> GT In 3			Audio				
> GT In 4							
> GT In 5					[		
> GT In 6			GT In 5			Matrix enable OFF	
> GT In 7			Audio				
> GT In 8							
> GT In 9							
> GT In 10			GT In 6			Matrix enable OFF 🔻	
> GT In 11			Audio				
> GT In 12			1000				
> GT In 13					-		
> GT In 14			GT In 7			Matrix enable OFF	
> GT In 15			Audio				
> GT In 16			MUURO				
> GT In 17							
> GT In 18			GT In 8			Matrix enable OFF 🔹	
> GT In 19			Audio				
> GT In 20			AUGIO				
> GT In 21					· · · · · · · · · · · · · · · · · · ·		
> GT In 22			GT In 9			Matrix enable OFF	
> GT In 23			Audio				

GT In N	Reference name for the GT input.		
Audio	Assigns the audio input to be used to receive GPIO data.		
Matrix Enable	This checkbox enables matrix control of the GT input. See Matrix Enable.		



## GT Out 1 to 64 Parameters

• Treedefinition: / GPI/O / GT 1 / GT Out 1				
Name Value ^	GT In GT Out			
> GT In 34	GT Out 1	Signaltozirkon	Matrix enable OFF 👻	
> GT In 35	GLOUT I	Signaltozirkon	Matrix enable OFF	
> GT In 36	Out 1			
> GT In 37	Out 2			
> GT In 38				
> GT In 39	Out 3			
> GT In 40	Out 4			
> GT In 41				
> GT In 42	Out 5			
> GT In 43	Out 6			
> GT In 44				
> GT In 45	Out 7			
> GT In 46	Out 8			
> GT In 47				
> GT In 48			Matrix enable OFF	
> GT In 49	GT Out 2		Matrix enable OFF	
> GT In 50	Out 1			
> GT In 51	Out 2			
> GT In 52				
> GT In 53	Out 3			
> GT In 54	Out 4			
> GT In 55				
> GT In 56 > GT In 57	Out 5			
> GI In 57 > GT In 58	Out 6			
> GI IN 58 > GT IN 59				
> GI In 59 > GT In 60	Out 7			
> GT In 60	Out 8			
> GT In 62				
> GT In 63			Matrix enable OFF 👻	
> GT In 64	GT Out 3		Matrix enable OFF 🔻	
GT Out 1 Signaltozirkon	Out 1			
> GT Out 2	Out 2			
> GT Out 3				
> GT Out 4	Out 3			
> GT Out 5	Out 4			
> GT Out 6				
> GT Out 7	Out 5			
> GT Out 8	Out 6			

GT Out N	Reference name for the GT output.		
Out 1 to 8	Assigns the 8 GPIO-bits which will be transmitted on the GT output.		
Matrix Enable	This checkbox enables matrix control of the GT output. See Matrix Enable.		

Once named, the 8 GPIO-bits from each GT Input appear under the "Logic -> GTn" branch of the 'Tree Selection' window:

	Correspond to the <b>Out 1</b> to <b>Out 8</b> logical functions as defined within the sending device configuration.
nin 1 to 8	The negated In 1 to In 8.



# 3.9 **GPI/O** Network

**GNET** elements, also known as **GPI/O Network**, can be used to exchange GPIO signals with other radio on-air systems via the control network. The GPI/O Network works on the principle of ports in order to manage the network traffic effectively. In the sending device, each element is assigned a port number. This must match the port number defined in the receiving device. The same element/port can be used to send and receive signals if you wish.

**Power Core** supports two possible protocols for the GPI/O Network, either TCP or UDP. All other systems support TCP only. The protocol is selected when you insert the GPI/O Network element.

To use UDP, both the sending and receiving device must be a Power Core. The advantages of using UDP are that the exchange uses less bandwidth, reduces the CPU usage, and is simpler and faster.

In each case, there are two parts to the configuration. First, define the TCP/IP connections in both the sending and receiving systems (via the "System -> Definition -> Param = TCPLink" branch of the 'Tree Definition'). Then, add a GPI/O Network element to both the sending and receiving systems.



## 3.9.1 Using TCP

Each GPIO Net TCP element can handle 32 GPIO signals and 10 level controls.

In the sending device, use the **General** tab to define the port number, options and the signal parameters which will be transmitted via the GNET port.

	CA Treedefinition: / GPI/O Network / * Desk / GPIO Net TCP = Nova17<->ruby						
Γ	Name Value	General					
>	Audio Input	GPIO Net TCP	Nova17<->ruby				
>	Audio Out Only	Port					
	Audio Output						
	Conf Bus	Port + 1					
>	Connect	Port + 2					
>	EmBER+	IP Address 3rd Byte	0				
2	EmBER+ A-stage	IP Address 4th Byte					
	GP Sum						
2	GPI/O	Mic Arb ignore incoming messa	ages				
<b> </b> ~	GPI/O Network	Mic Arb Offset	0				
	<ul> <li>* Desk</li> <li>&gt; GPIO Net TCP Nova17&lt;-&gt;ruby</li> </ul>	GPO 1					
	> GPIO Net UDP St1<->St2	GPO 2					
>	Label	GPO 3					
>	Level Control						
>	Logic	GPO 4					
>	MF Key	GPO 5					
>	Minimix	GPO 6					
>	N-1	GPO 7					
>	Source						
>	Sum Bus	GPO 8					
>	Surface	GPO 9					
>	System	GPO 10					
>	Vis Chan						
1		GPO 11					

GPIO Net TCP	Reference name for the element.				
Port	The port number (from 1 to 255).				
Port + 1	Assigns an input control signal (e.g. logic "true") to modify the port number. Use this when working with multiple consoles so that each console can communicate with the router via different GNET ports.				
Port + 2	See above.				
IP Address 3rd/4th Byte	If the third and/or fourth byte of the destination IP address are defined, only messages concerning this address/area are sent out. For example, when transmitting from a system with the default IP address (192.168.101.241), you might set the 3rd Byte = 101 and 4th Byte = 241. This can reduce the network overhead and improve speed in large configurations. Note that received messaged are not affected by these fields.				
Mic Arb Offset	This field applies an offset to <u>mic arbitration</u> numbers. Apply this to each GNET port within the central router so that the mic arbitration numbers for different consoles are discrete.				
GPO 1 to 32	Assigns the control functions which will be transmitted.				
Level Send 1 to 10	Assigns the level controls which will be transmitted.				



In the receiving device, be sure to enter the matching **Port** number in the **General** tab.

Then assign the element's control signals to other functions. There are two sets of signals which appear in the "Logic" and "Level Control" branches of the 'Tree Selection' window:

Level Control		
Lever Control		
✓ * Desk		
✓ GPIO Net TCP Nova17<->ruby		
NET.Level 1		
NET.Level 2		
NET.Level 3		
NET.Level 4		
NET.Level 5		
NET.Level 6		
were the		
	✓ GPIO Net TCP Nova17<->ruby NET.Level 1 NET.Level 2 NET.Level 3 NET.Level 4 NET.Level 5 NET.Level 6	✓ GPIO Net TCP Nova17<->ruby NET.Level 1 NET.Level 2 NET.Level 3 NET.Level 3 NET.Level 5 NET.Level 6

Net GPI 1 to 32	Correspond to the GPO 1 to 32 functions set within the sending device.
Net Level 1 to 10	Correspond to the Send Levels 1 to 10 set within the sending device.



## 3.9.2 Using UDP

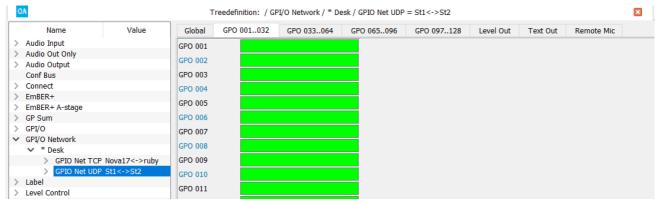
Each GPIO Net UDP element can handle 128 GPIO signals, 10 level controls and 32 text labels.

In this instance, each device can be configured for Tx/Rx, Tx only or Rx only. Use the **Global** tab to define the UDP IP Addresses and Port numbers. If you wish to configure Tx only or Rx only, then leave the corresponding fields empty.

OA		т	reedefinition: / GP	PI/O Network / * Desk / GPIO Net UDP = St1<->St2					×	
Name	Value	Global	GPO 001032	GPO 033064	GPO 065096	GPO 097128	Level Out	Text Out	Remote Mic	
> Audio Input		GPIO Net I	IDP	St1<->St2				7		
> Audio Out Only										
> Audio Output		UDP IP Ad	dress 1							
Conf Bus		UDP Tx Po	rt 1							
> Connect		UDP IP Ad	dress 2							
> EmBER+	> EmBER+									
> EmBER+ A-stage		UDP Tx Po	rt 2							
> GP Sum		UDP Rx Po	rt							
> GPI/O		GPI Values	on Connection Los	s set to 0	•					
✓ GPI/O Network										
✓ * Desk		Level Valu	es on Connection Lo	set to OFF	<b>•</b>					
> GPIO Net TC	P Nova17<->ruby	Text Label	s on Connection Los	s clear	•					
> GPIO Net UDI	P St1<->St2									
> Label										
> Level Control										

GPIO Net UDP	Reference name for the element.
UDP IP Address	Enter the IP Address for the UDP connection.
UDP Tx Port	Enter the Tx Port number or leave this field empty for Rx only.
UDP Rx Port	Enter the Rx Port number or leave this field empty for Tx only.
GPI Values / Level Values / Text Labels on Connection Loss	These fields determine what happens if there is a loss of connection.

Then use the **GPO**, **Level Out** and **Text Out** tabs to define the signal parameters which will be transmitted via the GNET port.





In the receiving device, use the Global tab to define the UDP IP Addresses and matching Rx Port number.

Then assign the element's control signals to other functions. There are three sets of signals which appear in the "Logic", "Level Control" and "Label" branches of the 'Tree Selection' window:

✓ Lo	gic				~
)	* (	Control			
~	* [	Desk			
	>	GPIO Net TCP	Nova17<->ruby		
	~	GPIO Net UDP	St1<->St2		
		GPI 001			
		GPI 002			
		GPI 003			
		GPI 004			
		GPI 005			
		GPI 006			
		GPI 007			
		GPI 008			
		GPI 009			~

Treeselection			?	×
✓ Label				^
✓ * Desk				
<ul> <li>GPIO Net UDP</li> </ul>	St1<->St2			
Text In 01				
Text In 02				
Text In 03				
Text In 04				
Text In 05				
Text In 06				
Text In 07				
Text In 08				
Text In 09				
Text In 10				
Text In 11				~
		ОК	Ca	incel

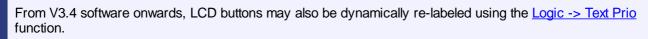
🔓 Treese	election			?	$\times$
✓ Level C	ontrol				~
× * [	Desk				
>	GPIO Net TCP	Nova17<->ruby			
~	GPIO Net UDP	St1<->St2			
	Level In 01				
	Level In 02				
	Level In 03				
	Level In 04				
	Level In 05				
	Level In 06				
	Level In 07				
	Level In 08				
	Level In 09				
	Level In 10				~
			ОК	Ca	ncel

GPI 1 to 128	Correspond to the GPO 1 to 128 functions set within the sending device.
Level In 1 to 10	Correspond to the Send Levels 1 to 10 set within the sending device.
Text In 1 to 32	Correspond to the <b>Text Out 1 to 32</b> set within the sending device.



## 3.10 Label

This element applies to key panels with LCD buttons. It allows dynamic editing of the LCD buttons using the separate software application **zirkonlabel**. It is supported by Power Core and sapphireMK2 / Nova17 systems.



Name	Value	General		
Audio Input		Label 1	Label1	
Audio Out Only		Laber I	Labert	
Audio Output		Label 2		
Conf Bus		Label 3		
Connect				
EmBER +		Label 4		
GP Sum		Label 5		
GPI/O				=
GPI/O Network		Label 6		
4 Label		Label 7		
C_AUTO_LABEL	bel1	Label 8		
D Label 2	Dell			
Label 3		Label 9		
Label 4		Label 10		
Label 5		Label 11		
Label 6				=

Once named, the auto label **Text** outputs appear within the 'Tree Selection' under "Label -> C\_AUTO\_LABEL -> Label N". Assign the **Text** control output to the <u>Label ID</u> of a key panel LCD button:

AO	Panels	× 04	Parameter: KS
Page 1 Page 2	Page 3 Page 4 VCA Module		
Page 1LCD 1	LCD1	Treeselection	? <u>×</u>
Red		/ Label	
Yellow		▷ * Abhören	
Green		▷ * Desk > * Kommando	
Blink		▷ *Ltg	
Name Line 1	LINE1	▷ * Mikrofone	
		▷ * Wahl ▷ * Zuspieler	
Name Line 2	LINE2	C_AUTO_LABEL	
Label ID	Label1Text	▲ Label 1 Label 1	
		.Text	
Page 1 LCD 2			
Red			
Yellow			
Green			
Blink			
Name Line 1			
Name Line 2			
Label ID			
Page 1LCD 3			
Red		ОК	Cancel
Yellow			

The button can now be labeled using the **zirkonlabel** software.



## 3.11 Level Control

Under the "Level Control" branch of the 'Tree Definition' you will find all of the system's assignable rotary controls, known as VCAs. These can be used to control any level such as the output level of a <u>Minimixer</u>.

The number of physical controls, and their parameters, vary depending on the system. They can be found on:

- The Central (or Monitor) Modules defined in Frames -> Surface.
- Some of the key panels defined in <u>Frames -> Panels</u>.
- Some DALLIS IO cards, such as the 945/61 DALLIS Headphone Output card or 945/05 GPIO card.

For each control, the most important parameter is its Reference name. The other parameters vary depending on the type of module. An example is included <u>later</u>.

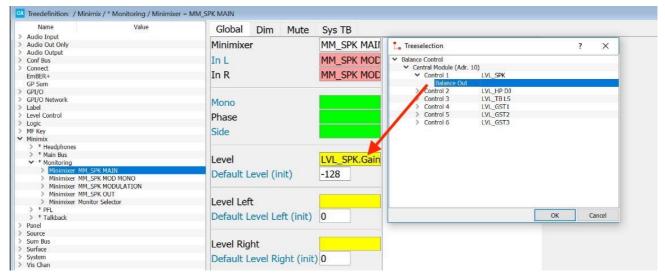
Once named, the control can be used to control the level of another element by clicking on any yellow "Level" parameter field and selecting the control 's **Gain Out** in the 'Tree Selection':

Name Value	Global Dim Mute Sys TB	? ×
Audio Input	Minimixer MM HP DJ OUT	( X
Audio Out Only	In L MM HP DJ MAIN V Level Control	
Audio Output	> * AES Sources	
Conf Bus	In R MM_HP D3 MAIN > * Hybrids	
Connect	> * Line Sources	
EmBER+	Mono > * Microphones	
GP Sum	Phase > * Tone	
GPI/O	✓ Central Module (Adr. 10)	
GPI/O Network	- Control 1	LVL_SPK
Label		LVL_HP DJ
Level Control	Level HP DJ.Gain Out Gain Out	
Logic		LVL_TB LS
MF Key	> Control 4	LVL_GST1
* Minimix		LVL_GST2
<ul> <li>* Headphones</li> </ul>		LVL_GST3
Minimixer MM_HP DJ MAIN	Default Level Left (Init) 0	
Minimixer MM_HP DJ OUT		
Minimixer MM_HP GUEST1 OUT	Level Right	
Minimixer MM_HP GUEST2 OUT	Default Level Right (init) 0	
> Minimixer MM_HP GUEST3 OUT		
> * Main Bus		
> * Monitoring	Balance Inc	
> * PFL		
> * Talkback		
Source		
Sum Bus		
Surface		OK Cancel
System		
Vis Chan		



## 3.11.1 Balance Control

If the control supports a secondary function (push down and turn), then this can be assigned to any yellow "Balance" parameter:



Note that you may need to enable the "**Balance**" option in the "**Level Control**" parameters before the secondary function can be assigned. Note also that Balance Controls take their name from the "**Level Control**" Reference name, and so do not appear separately under the "Balance Control" branch of the 'Tree Definition'.



## 3.12 Logic

Logic elements create logical functions which can be used to customize system behaviour.

Logic elements can be connected together to create exactly the right control signal. It is a good idea to regularly save, transfer and test your configuration to avoid feedback loops within the programing.

Several elements are supported for different applications. The table below summarizes all possibilities.

'Logic' Element	Application	r	С	sc	S	N29
ALARM	Supports the external Alarm Log Server option.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
AND8	A logical AND gate with 8 inputs.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓
ASSIGN	Assign a source to a fader strip using a logical control signal.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×
<u>Blender</u>	Create a crossfade between two levels. The output can control another variable level parameter.	~	~	✓	~	✓
Blink	Convert a static signal such as a GPI into a dynamic toggling signal.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Button 16	A 1-out-of-16 function for inter-canceling button groups.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	✓
Button 64	Identical to the 'Button 16' but with 64 inputs and 64 outputs.	✓	$\checkmark$	✓	$\checkmark$	<b>~</b>
DEL	A logical DELAY.	$\checkmark$	$\checkmark$	✓	$\checkmark$	<b>~</b>
<u>DFF</u>	A Data Flip Flop. Evaluates inputs with a rising clock signal.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Enable Func	A set of eight enable functions with global unlock and feedback signalisation. Used to create a signal selector.	~	~	✓	~	✓
Feedback Arbiter	A 1-out-of-16 selector switch with arbitration.	$\checkmark$	$\checkmark$	✓	$\checkmark$	<b>~</b>
Gate	A logical GATE. Swaps two groups of signals (A to B).	✓	$\checkmark$	✓	$\checkmark$	<b>~</b>
	An impulse. Converts a static signal to a single pulse.	$\checkmark$	$\checkmark$	✓	$\checkmark$	<b>√</b>
Level Prio	A prioritised 1-out-of-16 level control.	$\checkmark$	×	×	×	×
LS Command	Supports the Line scheduler Server option.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
<u>Macro</u>	Works in conjunction with the <b>Macro Editor</b> software to action a series of functions or interchange functions between systems.	~	×	×	~	×
MFE	A Mono Flip Flop. Generates an output pulse from a static input.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Mic Arbitration	Manage the control of shared microphone sources.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×
MOM LAT	Create a key that latches on (when you press quickly) or is momentary (when you press and hold).	~	~	~	~	✓
Mon Desk	Supports a custom panel for crosspoint monitoring.	$\checkmark$	×	×	$\checkmark$	<b>~</b>
MTX Src Pool	Create a pool of audio inputs that can be assigned to a source directly from the control surface.	~	~	~	~	×
MUX/DEMUX 8	Create a 1-to-8 de-multiplexer and four 8-to-1 multiplexers.	$\checkmark$	$\checkmark$	✓	$\checkmark$	<b>~</b>
NOT	A logical NOT gate to invert a control signal.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
On Air Arbiter	A 1-out-of-8 selector switch with arbitration and protection.	$\checkmark$	×	$\checkmark$	$\checkmark$	$\checkmark$
<u>OR32</u>	A logical OR gate with 32 inputs.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
OR8	A logical OR gate with 8 inputs.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

# 3. 'Tree Definition' Elements



'Logic' Element	Application	r	С	SC	S	N29
<u>PRIO</u>	A 1-out-of-16 function similar to a 'Button 16', but with prioritised switching.	~	~	~	~	✓
RAVENNA Src Pool	Create a pool of RAVENNA streams that can be assigned to a source directly from the control surface.	✓	×	×	×	×
RAVENNA Static Stream	Configure a RAVENNA stream using stream parameters or RTSP URL.	~	×	×	×	×
RAVENNA Stream Control	Configure redundancy for specific RAVENNA inputs.	~	×	×	×	×
Server based Timer	Create a VisTool timer that can be synchronized across multiple instances.	~	×	×	×	×
ShiftReg 16	A logical SHIFT REGISTER with 16 outputs.	✓	$\checkmark$	$\checkmark$	$\checkmark$	<b>√</b>
Static Network Route	Configure a static network route for control or streaming.	✓	×	×	×	×
TB State	Provide signalisation to show when talkback is active.	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Text Prio	Dynamically change the LCD button labels on a key panel.	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
TFF	A Toggle Flip Flop. Creates a latching control signal.	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
VispageSwitch	Define <b>VisTool</b> functions such as page switching, snapshot management and user rights access.	~	✓	~	~	✓
The following elements	appear if the corresponding module is added to the 'Frame -> Screen'	configu	uration	•		
Matrix Control	Operate matrix crosspoints from VisTool.	✓	$\checkmark$	$\checkmark$	$\checkmark$	✓
Network Assign	Manage multi-system network connections from VisTool.	✓	$\checkmark$	$\checkmark$	$\checkmark$	<b>√</b>
PARM Control Module	Adjust signal processing parameters from VisTool.	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Screen Matrix Monitor	Operate a monitor matrix from VisTool.	✓	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Screen Matrix TB	Operate talkback switching from VisTool.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
<u>Screen Src Assign</u> <u>Module</u>	Assign sources to fader strips from VisTool.	~	~	~	~	~



## 3.12.1 ALARM

## "Logic -> ALARM"

To support an external Alarm Log Server, you will need to define an **Alarm** element to the "**Logic**" branch of the 'Tree Definition'.

Name 🔨	General	
Audio Input Audio Input Audio Output Balance Control Conf Bus Connect Element State EmBER+ GP Sum GPI/O GPI/O Hidden Label Label Level Control V Logic V cogic V cogic V Seak ALARM * Extension Module Clobal * Microphones * Microphones * Microphones * Off Air Record Bus Assis Off Air Record Bus Assis Off Air Record Bus Assis V Off Air Record Bus Assis V Off Air Record Conferen * Special Functions * Split Mode * Special Functions * Split Mode * User Configuration V Visualisation Matrix Control Module 2 ( Matrix 128*128 Control M	ALARM ALARM Invert Trigger Info Text Falling Edge Info Alarm Number Unit 0 Address 0	

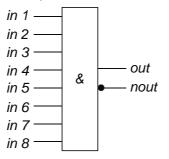
ALARM	Reference name for the element.
Trigger	Assigns the input control signal which will transmit the <b>Text Rising</b> and <b>Text Falling Edge</b> messages at each status change.
Invert	When checked, the input control signal is inverted.
Text Rising Edge	Enter the text which will be transmitted to the external Alarm Log Server system at the rising edge of the <b>Trigger</b> signal.
Text Falling Edge	Enter the text which will be transmitted to the external Alarm Log Server system at the falling edge of the <b>Trigger</b> signal.
Info	When checked, this output is treated as an 'Info' message within the Alarm Log Server system, as opposed to an 'Alarm' message.
Alarm Number	Enter a specific error code which you wish to be transmitted to the external messaging system.
Unit	The unit number is transferred to the Alarm Log Server. For example, you may set Studio 1 as Unit 1, etc.
Address	This is an Address transferred to the Alarm Log Server. For example, you may use this to identify different system addresses.



## 3.12.2 AND8

### "Logic -> AND8"

An AND8 element is a logical AND gate with 8 inputs. It can be used to 'AND' several control signals.



### **Truth Table**

in 1	in 2	in 3	in 4	in 5	in 6	in 7	in 8	out	nout
1	1	1	1	1	1	1	1	1	0
0	х	x	х	х	х	х	х	0	1
х	0	х	х	х	х	х	х	0	1
х	х	0	х	х	х	х	х	0	1
х	х	х	0	х	х	х	х	0	1
х	х	х	х	0	х	х	х	0	1
х	х	х	х	х	0	х	х	0	1
x	х	x	x	х	x	0	х	0	1
x	х	х	х	х	x	x	0	0	1



### **General Parameters**

OA			Treedefinition: / Logic / * Control / AND8	×
Name	Value	General		
> Audio Input		AND8		
> Audio Out Only		In 1	Neg 🗌	
> Audio Output				
Conf Bus		In 2	Neg 🗌	
> Connect		In 3	Neg 🔽	
> EmBER+		In 4	Neg 🗌	
> EmBER+ A-stage				
> GP Sum		In 5	Neg 🗌	
GPI/O     GPI/O Network		In 6	Neg 🗌	
> Label		In 7	Neg 🔽	
> Level Control		In 8	Neg	
✓ Logic				
> * AutoMix				
<ul> <li>Control</li> </ul>				
> AND8				
> NOT TRU	UE			
	iftReg			
Static Network Route Net	twork			
> * Desk				
> * Hybrid Sources				
	-			
AND8	R	eference nar	me for the element.	

ANDO				
	Assigns input signals to each of the 8 inputs which are to be AND. Inputs which are not assigned are set to logical "1" or "TRUE".			
Neg	When checked, the input is inverted before being processed by the AND gate.			
The control outputs appear	under the "Logic -> <groupname> -&gt; AND8" branch of the 'Tree Selection' window:</groupname>			

Out	The AND output.
nOut	Negated AND.

## 3.12.3 **ASSIGN**

### "Logic -> ASSIGN"

An **ASSIGN** element can be used to assign a source to a fader strip under the control of a logical signal such as an MF Key. By programing several ASSIGN elements which use the same **In** control signal, you can assign several fader strips from a single button press, or create a Clear button which would remove sources from fader strips.

#### **General Parameters**

Name	<ul> <li>General</li> </ul>	
Logic	ASSIGN	Mic5 -> 1
* Abhören	, ibbroit	
Alarm	In	MIC 5.Key
▷ *Cart	Source	Mic 5.Src
* Comod/News Bdf	Source	MIC 5.5rc
▲ *Desk	Fader No.	1
AND8		
AND8		
AND8		
ASSIGN		
DEL		

ASSIGN	Reference name for the element.
In	Assigns the input control signal to action the fader strip assignment.
Source	This is the source which will be assigned to the fader strip. To assign silence leave this entry blank.
Fader No.	This is the fader number where the source will be assigned when the Input condition is true.



## 3.12.4 Blender

#### "Logic -> Blender"

A **Blender** element can be used to blend (crossfade) between two levels. The output can be used to control another variable level parameter (e.g. the **Level** of a <u>Minimixer</u>).

The "Max" and "Min" levels define the maximum range of the element; the difference should be greater than 30dB for proper operation.

Up to eight additional input channels may be defined to action different blend times and levels within the Max/Min range. Every channel has a trigger and logic outputs: "Active" and "At Level". "Active" shows the last triggered channel. "At level" shows the reached destination level. A blend may be overridden by a different trigger.

#### **General Parameters**

Name	Value	^ General					
Label				1			
Level Control		Blender	Blend 1				
Logic					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
* AES Sources		Trigger Max	Blend Up 10s	Time Max (1/10 sec) 100	Level Max (dB) 0		
<ul> <li>* Blends</li> </ul>		Tulana Mila	Diana di Diana a	The Min (4/40 ) 400	Louis Min (JD) 20		
✓ Blender	Blend 1	I rigger Min	Blend Down	Time Min (1/10 sec) 100	Level Min (dB) -20		
Trigger Max	Blend Up 10s.Key	Init Value	Lovel Min -			1	
Time Max (1/10 sec)	100						
Level Max (dB)	0	Trigger 1	Blend Up 5s.k	Time 1 (1/10 sec) 50	Level 1 (dB) 0	1	
Channel "Max" active							
Trigger Min	Blend Down 10s.K	Trigger 2	Blend Down S	Time 2 (1/10 sec) 50	Level 2 (dB) -120		
Time Min (1/10 sec) Level Min (dB)	100						
Channel "Min" active	-20	Trigger 3	Blend Up 2s.H	Time 3 (1/10 sec) 20	Level 3 (dB) 0		
Init Value	0	Trigger 4	Blend Down 2	Time 4 (1/10 coc) 20	Level 4 (dB) 120		
At Level Max	0	Trigger 4	Dienu Down A	Time 4 (1/10 sec) 20	Level 4 (dB) -120		
Blending		Trigger 5	Blend -3dB 3s	Time 5 (1/10 sec) 30	Level 5 (dB) -3		
At Level Min		ingger 5			Level 5 (ub) -5		
Blend Level		Trigger 6	Blend -6dB 3s	Time 6 (1/10 sec) 30	Level 6 (dB) -6		
Inverse Blend Level							
Trigger 1	Blend Up 5s.Key	Trigger 7	Blend -9dB 3s	Time 7 (1/10 sec) 30	Level 7 (dB) -9		
Time 1 (1/10 sec)	50				1		
Level 1 (dB)	0	Trigger 8	Blend Down (	Time 8 (1/10 sec) 1	Level 8 (dB) -120		
Channel 1 active							
At Level 1							
Trigger 2	Blend Down 5s.Key						
Time 2 (1/10 sec)	50						
Level 2 (dB)	-120						
Channel 2 active							
At Level 2							
Trigger 3	Blend Up 2s.Key						
Time 3 (1/10 sec)	20						
Level 3 (dB)	0						
Channel 3 active							
At Level 3							
Trigger 4	Blend Down 2s .Key						
Time 4 (1/10 sec)	20						
Level 4 (dB)	-120						
Channel 4 active							
At Level 4							

Blender	Reference name for the element.
Trigger Max/Min	Assign the input control signal which will action the fade up to maximum and fade down to minimum level.
Time Max/Min (1/10 sec)	Enter the duration of the fade up (to max.) and fade down (to min.).
Level Max/Min (dB)	Enter the maximum and minimum levels for the fade up/down; the difference should be greater than 30dB for proper operation.
Init Value	Determines the state of the blender after a cold start, either Level Max or Level Min.
Trigger 1 to 8	Assign the input control signal which will action the interim fade(s).
Time 1 to 8	Enter the duration of each interim fade.
Level 1 to 8	Enter the level for the fade. Note that all levels must be within the Level Max/Level Min range.

The blender outputs appear in the "Level Control" branch of the 'Tree Selection' window when assigning a variable level parameter. You can use the **Blend Level** and **Inverse Blend Level** to crossfade between two signals.

Blend Level	The output of the blender.
Inverse Blend Level The inverted output of the blender.	



## 3.12.5 Blink

#### "Logic -> Blink"

A **Blink** element converts a static signal such as a GPI into a dynamic toggling signal (on/off/on/etc). For example, to create a blinking MF Key to signal an incoming telephone call.

The **Blink** element uses a lot of resources and may slow down the real time operation of the system.

#### **General Parameters**

Name	Value	General	
Judio Enput Judio Dut Othy Judio Out Othy Judio Out Out Confiss Confis Confiss Confis Confiss Confiss		Blink Data On time (1/10 sec) 20 Off time (1/10 sec) 20	

Blink	Reference name for the element.	
Data	This control signal switches on the blink function.	
On time (1/10 sec)	Enter the duration of the on time.	
Off time (1/10 sec)	Enter the duration of the off time.	

The control outputs appear under the "Logic -> <GroupName> -> BLINK" branch of the 'Tree Selection' window:

Out	The BLINK output.
nOut	Negated BLINK.

### 3.12.6 Button 16

#### "Logic -> Button 16"

A **Button 16** element is a 1-out-of-16 function, which is typically used to create an inter-cancelling button group. For example, to create a set of inter-canceling signal buttons to indicate the on-air status of a range of studios.

The function has 16 inputs and 16 outputs. A rising edge at one of the inputs sets the output of the same number to a logical "1". It remains set until a rising edge is received at another input. When this occurs the first output is reset to "0", and the new output is set to "1". In other words, only one output is ever active.

The **Button 64** logic element is identical to the **Button 16** but offers more inputs and outputs. To configure prioritised switching, use a <u>Logic -> Prio</u> element.



### **General Parameters**

Name	Value	General	
> Audio Input			
> Audio Out Only		Button 16	BT16_MON SEL PGM
> Audio Output		In 1	GT_MON SEL IN 1.Out A.1
Balance Control Conf Bus		10.1	GI_MON SEL IN LOUE A.1
> Connect		In 2	GT MON SEL IN 1.Out A.2
Element State			
EmBER+		In 3	GT_MON SEL IN 1.Out A.3
GP Sum		In 4	GT MON SEL IN 1.Out A.4
> GPI/O			
> GPI/O Network Hidden		In 5	GT_MON SEL IN 1.Out A.5
> Label		In 6	GT MON SEL IN 1.Out A.6
> Level Control		10.0	GI_MON SEL IN I.OUL A.0
✓ Logic		In 7	GT MON SEL IN 1.Out A.7
* AES Sources			
> * Blends		In 8	GT_MON SEL IN 1.Out A.8
> * Desk > * Extension Module		In 9	GT_MON SEL IN 2.Out A.1
Slobal			
> * Microphones		In 10	GT_MON SEL IN 2.Out A.2
<ul> <li>* Monitoring</li> </ul>		In 11	GT_MON SEL IN 2.Out A.3
> Button 16	BT16_MON SEL PGM		
> Button 16 > Gate	BT16_MON SEL REC GT_MON SEL IN 1	In 12	GT_MON SEL IN 2.Out A.4
> Gate	GT_MON SEL IN 1 GT_MON SEL IN 2	7- 43	GT MON SEL IN 2.Out A.5
> Gate	GT_MON SEL OUT 1	In 13	GI_MON SEL IN 2.OUT A.5
> Gate	GT_MON SEL OUT 2	In 14	
> MOM LAT	ML_SPK DIM		
> MOM LAT	ML_SPK MUTE	In 15	
> OR8	OR_REC MODE PULSE	In 16	
> THE > THE	TFF_SPK MONO TFF_SPK PHASE		
> THE	TFF_SPK SIDE	In State	
* Off Air Record Bus Assignment		Pushout	
> * Off Air Record Conference			
> * Redlight		Disable	
> * Special Functions		Deast	
> * Split Mode > * Talkback		Reset	
> * Tarkback * User Configuration		Preset	
> * Visualisation			
> Screen Src Assign Module 14 (Adr. E	)		

Button 16	Reference name for the element.
In 1 to 16	A rising edge at an input sets the corresponding control output to logical "1", and any other active control output to logical "0".
In State	Can be assigned to the <b>OutState</b> of another Button16, a <u>Button64</u> or <u>TConn64</u> in order to cascade elements (see below). Or, to the <b>Save Out</b> state from a " <u>System Definition -&gt; Parameter = ElementState</u> " snapshot in order to respond to snapshot recalls.
Pushout	After power on, the control output defined in <b>Preset</b> is set to logical "1" as a default and there is always one active output, if you switch inputs. If you force the <b>Pushout</b> input to be active, the default is all outputs set to logical "0" and inputs may be cancelled without activating a different output.
Disable	When this input control signal is active, all control inputs are locked. This freezes the current state of all control outputs until the <b>Disable</b> signal is turned off.
Reset	This input control signal resets the status of the 16 control outputs to the default. If no <b>Preset</b> is entered, the default is <b>Out 1</b> = a logical "1". Otherwise the input entered in <b>Preset</b> is set to logical "1".
Preset	Enter the number of the input which you wish the Button 16 to reset to when <b>Reset</b> is actioned. This is also the state which the Button 16 will reset to after a cold start. If no value is entered, Button 16 resets to <b>Out 1</b> if <b>Pushout</b> is inactive, or none, if <b>Pushout</b> is active

The control outputs appear under the "Logic -> <GroupName> -> Button 16" branch of the 'Tree Selection' window. You will also find the element's **Out State** under "Element State -> <GroupName> -> Button 16".

The default state after power on is **Out 1** = logical "1"; all other outputs are logical "0".

The Global -> In State of a Button16 can be assigned to the Out State of another Button16, <u>Button64</u> or <u>TConn64</u> in order to cascade elements. The **Out State** of the master element should be assigned to the **In State** of the slave. The slave will then follow all switch changes which occur in the master.

## 3.12.7 Button 64

#### "Logic -> Button 64"

This element is identical in operation to a **Button 16** but with 64 inputs and 64 outputs.



## 3.12.8 DEL

### "Logic -> DEL"

A **DELAY** element can be used to delay a control signal. For example, to issue a record signal following by a delayed Play or Pause command to an external recording device (to commence recording).

### **General Parameters**

Name	Value	General
Audio Input		00
> Audio Out Only		DEL
> Audio Output		In
Balance Control		Delay Time (1/30 sec)
> Conf Bus		Delay Time (1/50 sec)
> Connect		
Element State		
EmBER+		
GP Sum		
> GPI/O		
GPI/O Network		
Hidden		
> Label		
> Level Control		
Y Logic		
✓ * Desk		
> DEL		
> * Extension Module		
> 8 Clabel		

DEL	Reference name for the element.			
In	Assigns the control signal you wish to delay.			
Delay Time (1/30 sec)	Enter the delay time in degrees of 1/30 second. Note that this time is approximate.			
The control outputs appear under the "Logic -> <groupname> -&gt; DEL":</groupname>				

The delayed output.	Out	The delayed output.
---------------------	-----	---------------------



## 3.12.9 DFF (Data Flip Flop)

#### "Logic -> DFF"

A **DFF** element is a Data Flip Flop. It can be used to evaluate inputs with a rising clock signal.

#### **General Parameters**

Name	Value	General	
> Audio Input		DFF	
Audio Out Only			
> Audio Output		Data	
Balance Control		Clock	
> Conf Bus		CIOCK	
Connect		Reset Static	
Element State		Reset Pos Edge	
EmBER+		Academ of Edge	
GP Sum			
> GPI/O			
GPI/O Network			
Hidden			
> Label			
Level Control			
<ul> <li>Logic</li> </ul>			
✓ * Desk			
> Button 16			
> DEL			
> DFF			
> MFF			
> NOT			

DFF	Reference name for the element.			
Data	Assigns the data input which you wish to process.			
Clock	Assigns the clock source. If you leave this field empty, then the system clock will be used (approximately 60Hz).			
Reset Static	Sets the output to be false as long as <b>Reset Static</b> is active.			
Reset Pos Edge	Resets the output with a rising positive edge.			
The control outputs appear under the "Logic -> <groupname> -&gt; DFF" branch of the 'Tree Selection' window</groupname>				
Out	The DFF output.			

## 3.12.10 Enable Func

Negated DFF.

nOut

#### "Logic -> Enable Func"

The **Enable Function** element includes a set of eight independent enable functions with global unlock and feedback signalisation. It can be used to create a selector, such as a studio to transmitter switch, which requires feedback from a matrix as to which transmission lines are available/active.

Up to 8 input (Key) signals can be defined each with its own **Enabled**, **Prepared**, **Active** and **Key.out** output. Each input also has an **Active** and **Enabled** input signal. For our example, the operation is as follows:

1. Transmission lines which are available are signaled from the matrix via the **Enabled** control input.

The **Enabled** output is True when the **Enabled** input is True and can be used to signal that the line is available – for example to illuminate the green lamp of an MF Key.

2. Transmission lines which are active are signaled from the matrix via the Active control input.

The **Active** output is True when the **Active** input is True and can be used to signal that the line is active - for example to illuminate the red lamp of an MF Key.

3. An operator must press and hold the global **Unlock** button and then press the **Key** button to prepare a new assignment.

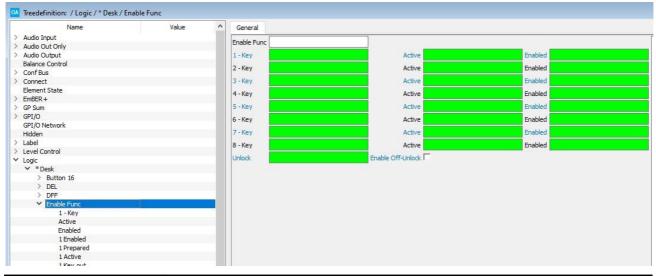


If the **Unlock** AND **Enabled** AND **Key** inputs are all true, then the **Prepared** output is set to True. The **Prepared** output can be used to switch the assignment within the matrix and signal the selection – for example, make the MF Key blink.

4. Assuming the matrix then returns a True signal to the **Active** input, the **Active** output would signalise the assignment - illuminate the red lamp of the MF Key.

This element controls the logic of the selector only and not the audio crosspoints. Alternative elements are the <u>On Air Arbiter</u> and <u>Feedback Arbiter</u> which add arbitration to the logic.

#### **General Parameters**



Enable Func	Reference name for the element.	
X – Key	Assigns the <b>Key</b> control input which will be used to prepare the assignment.	
Active	Assigns the control input used to signalise that the line is active.	
Enabled	Assigns the control input used to signalise that the line is enabled (available).	

The control outputs appear under the "Logic -> <GroupName> -> Enable Func" branch of the 'Tree Selection' window:

x Enabled	True if the <b>Enabled</b> input is True.
x Prepared	True if the <b>Enabled</b> AND <b>Unlock</b> AND <b>Key</b> inputs are true.
x Active	True if the <b>Active</b> input is True.
x Key.out	True if the <b>Key</b> input is True.



## 3.12.11 Feedback Arbiter

#### "Logic -> Feedback Arbiter"

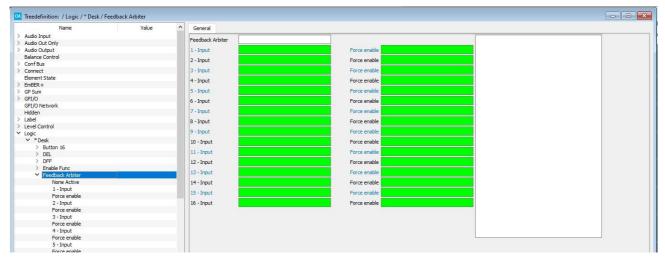
The **Feedback Arbiter** element is a 1-out-of-16 selector switch with arbitration. It is ideal for applications such as a telephone hybrid selector.

If an output is active, then a different output can ONLY be activated by triggering both the **Force Enable** and **Input x** control signals - for example, if MF Keys are used for the control signals, then the operator needs to press both **Force Enable** plus the **Input x** MF Key to change the active output. The **Enabled** and **Active** control outputs can be used to signal the state of the arbiter by illuminating MF Keys.

This element controls the logic of the selector only and not the audio crosspoints.

Alternative elements are the <u>On Air Arbiter</u> which offers more protection, and the <u>Enable Func</u> which provides signalisation but not arbitration.

#### **General Parameters**



Feedback Arbiter	Reference name for the element.
X – Input	Assigns the MF Key (or control input) which will activate the corresponding output if no other output is True.
Force enable	Assigns the MF Key (or control input) which will force the corresponding output to active and set all other outputs to False. Note that both the <b>Force enable</b> and <b>X</b> - <b>Input</b> control signals must be true to change the
	active output.

The control outputs appear under "Logic -> <GroupName> -> Feedback Arbiter" in the 'Tree Selection' window:

None active	True if all inputs are False.
x Active	True if the corresponding input is True.
x Enabled	True if either all inputs are False or the corresponding Force enable is True.
X Force Enabled	True if the corresponding Force enable is True.



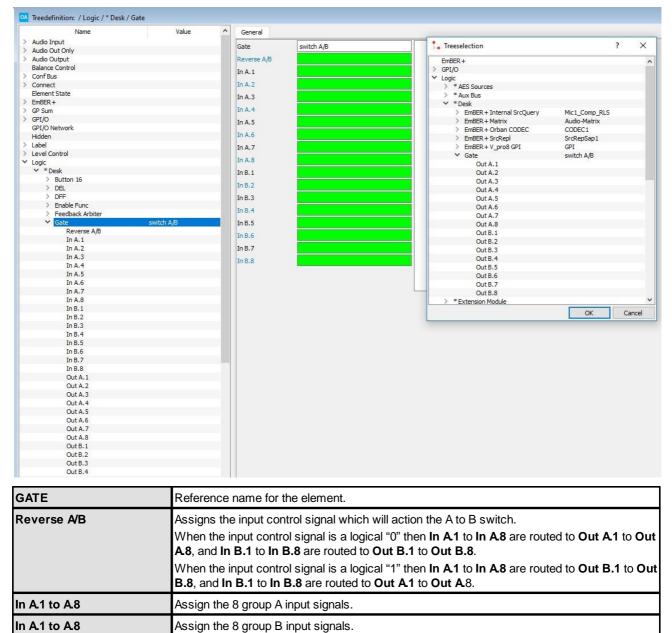


## 3.12.12 Gate

#### "Logic -> Gate"

A **Gate** element is a logical GATE. It can be used to swap two groups of signals (A to B), where each group has 8 inputs and 8 outputs. For example, to switch the output of a monitoring source selector between Loudspeakers and Phones.

#### **General Parameters**



The control outputs appear under the "Logic -> <GroupName> -> Gate" branch of the 'Tree Selection' window:

Out A1 to Out A8	Group A outputs.
Out B.1 to Out B.8	Group B outputs.



## 3.12.13 IMP

### "Logic -> IMP"

An **Impulse** element can be used to convert a static signal such as a GPI into a single pulse:

ln:	
Switch On Out:	pulsetime On
Switch off Out:	pulsetime Off

#### **General Parameters**

Name	Value	General
Audio Input		IMP
> Audio Out Only		IMP
> Audio Output		In
Balance Control		Pulsetime On (1/10 sec) 2
> Conf Bus		
> Connect		Pulsetime Off (1/10 sec) 2
Element State		Re-trigger
> EmBER +		ine ungger
> GP Sum		
> GPI/O		
<ul> <li>GPI/O Network</li> </ul>		
> *Desk		
Hidden		
> Label		
> Level Control		
✓ Logic		
✓ * Desk		
> Button 16	GPIO-Button	
> DEL		
> DFF		
> Enable Func		
> Feedback Arbiter		
> Gate	switch A/B	
> IMP		
> MFF		
> NOT		
> OR 32		
> PRIO		
> TFF		

ІМР	Reference name for the element.
In	The input control signal.
Pulsetime On (1/10 sec)	Enter the pulse time in degrees of 1/10 second. Note that this time is approximate.
Pulsetime Off (1/10 sec)	Enter the delay time in degrees of 1/10 second. Note that this time is approximate.
Re-trigger	If enabled, the IMP may be re-triggered during the "on" cycle, leading to a longer "on" period.

The seven control signals appear in the "Logic -> <GroupName> -> IMP" branch of the 'Tree Selection' window:

Switch On Out	Becomes active when a rising edge is supplied to the input. The status remains set for the duration of the <b>Pulsetime On</b> .
Neg Switch On Out	Negative output of the Switch On Out.
Switch Off Out	Becomes active once <b>Pulsetime On</b> is finished. The falling edge of <b>Switch On Out</b> triggers the rising edge of <b>Switch Off Out</b> . The status remains set for the duration of the <b>Pulsetime Off</b> .
Neg Switch Off Out	Negative output of the Switch Off Out.
Switch OR (On/Off) Out	Becomes active if the Switch On Out is true OR the Switch Off Out is true.
Neg Switch OR (On/Off) Out	Negative output of the Switch OR (On/Off) Out.
Switch OR (In/On/Off) Out	Becomes active if the input is true OR the <b>Switch On Out</b> is true OR the <b>Switch Off Out</b> is true.



## 3.12.14 Level Prio

#### "Logic -> Level Prio"

A Level Prio element can be used to create a prioritised level control. The function has 16 inputs and one output.

If no control inputs are active, then the output is set to the **Prio 0 Level**.

If one or more control inputs are active, then the control signals are prioritised from 1 (highest) to 16 (lowest). The output is set to the winning **Default** value or **Level** control (if one is defined).

#### **General Parameters**

OA		Treedefinition: / Logic / * Des	sk / Level Prio = Level Prio	1			×
Name V	alue General						
Name     V       > Audio Input	Level Prio Prio 0 Level In 1 In 2 In 3 In 4 In 5 In 6 In 7 In 8 In 8 In 9 In 10	Level Prio 1 -128	Default Default Default Default Default Default Default Default Default Default Default Default Default Default Default Default Default Default	-128 -128 -128 -128 -128 -128 -128 -128	Level		
Level Prio	Enter a refer	ence name for the el	lement.				
Prio 0 Level	Enter the lev	el (in dB) to be applie	ed when no contro	ol inputs are	active.		
In 1 to In 16		ut control signals 1 to d from 1 (highest) to		one input is	active, then th	e control signa	als
Default		el (in dB) to be applien n nothing is assigned		•	ctive. The <b>Def</b>	ault value is	
Level		evel control to be use					

fader or Central Module VCA. If this field is left empty, then the **Default** value will be used.



Once named, the Level Prio output (Level Out) appears within the 'Tree Selection' when assigning a Level parameter. This allows it to be assigned to any other Level field. For example, to control the output level of a minimixer:

OA	Treedefinition: / Mi	nimix / * Desk / Minimixer TB	Input = MM_MONITOR HP GUEST		×		
Name Value	Global Dim M	Mute TB					
> Audio Input	Minimixer TB Input	MM_MONITOR HP GUEST	1				
> Audio Out Only							
> Audio Output	In L			Le Treeselection		?	×
Conf Bus	In R			✓ Level Control			
> Connect			-	✓ * Desk			
> EmBER+	Mono			> GPIO Net TCP	Nova17<->ruby		
> EmBER+ ALine				> GPIO Net UDP	St1<->St2		
> GP Sum	Phase			✓ Level Prio	HP Level Prio		
> GPI/O	Side			Level Out	HP Level Prio		_
> GPI/O Network				> * Digital Sources			
> Label				> * Hybrid Sources			
> Level Control	Level	HP Level Prio.Level Out					
> Logic	Default Level (init)	0		> * Microphone Sources			
> MF Key			-	> * Ravenna Sources			
✓ Minimix	Level Left		1	> * Studio Mics > * Tone			
✓ * Desk			1		(10)		
> Minimixer Sys TB MM_MONIT	Default Level Left (init)	0		> Central Module 16 (Adr. 0)	x10)		
Minimixer TB Input MM_MONIT			-				
> N-1	Level Right						
> Source	Default Level Right (init						
> Sum Bus	Derault Level Right (Init	JU					
> Surface							
> System	Balance Inc						
> Vis Chan							



## 3.12.15 LS Command

#### "Logic -> LS Command"

A LS Command element can be used to change and monitor Triggers on a Line Scheduler (LS).

To use this feature there must be an active TCP/IP connection to a matrix server (single or redundant) using the **TCP Link** mode **AIF1/2** (defined under "<u>System -> Definition -> Param = TCPLink</u>").

#### **General Parameters**

Name	Value	General	
Audio Input		LS Command	Makro 380
Audio Out Only		LS Command	Makro 360
Audio Output		Action :	ON & OFF <
Balance Control		Macro/Template No	31
Conf Bus		Macio/Template No	
Connect		In	Macro.Key
Element State		Macro active in	MacroActive.Key
EmBER+		indero dedive in	macroneuvencey
GP Sum			
GPI/O			
GPI/O Network			
Hidden			
Label			
Level Control			
/ Logic			
> * Desk			
✓ * Dispo			
<ul> <li>LS Command</li> </ul>	Makro 380		
Action :	0		
Macro/Template No	31		
In	Macro.Key		
Macro active in	MacroActive.Key		
Label ID			
Macro defined			
Macro active			

LS Command	Reference name for the element.
Action	Select the action which will happen when the In control input becomes true.
Macro/Template No	Enter the Line Scheduler's Trigger number (usually found under Administration / Trigger names).
In	Assign an input control signal to trigger the <b>Action</b> .
Macro active in	You can assign an input control signal to display the active state.

The control outputs appear under the "Logic -> <GroupName> -> LS Command" branch of the 'Tree Selection' window:

Macro defined	True when the specified Macro/ Template No is used by any macro or template in the LS.
Macro active	True is the macro or template is active.

### 3.12.16 Macro

"Logic -> Macro"

Macro elements are described later together with the Macro Editor software.



# 3.12.17 MFF (Mono Flip Flop)

### "Logic -> MFF"

A MFF element is a Mono Flip Flop. It can be used to generate an output pulse from a static input.

### **General Parameters**

Name	Value	General
tio Input tio Out Only tio Output 16 Bus anect SER + Sum /0 /0 Network el el Control tic ** Desk > Button 16	GPIO-Button	MFF Trigger Toggle Reset Time (1/10 sec)
bitton 16     DEL     DFF     Enable Func     Feedback Arbiter     Gate     IMP     MFF	GPIO-Button	
> NOT	True	

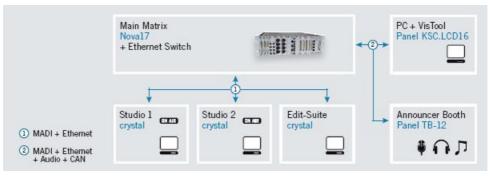
MFF	Reference name for the element.
Trigger	With a positive edge at this input, the control output is set to logical "1" for the Time set below.
Toggle	Assigns the input control signal to be toggled.
Reset	Assigns a control input to set the control output to logical "0".
Time (1/10 sec)	Enter the time for which you wish the control output to be set to logical "1". The time is set in approximately 1/10 second steps.
The control outputs appear	under the "Logic -> <groupname> -&gt; MFF" branch of the 'Tree Selection' window:</groupname>
Out	The MFF output.



## 3.12.18 Mic Arbitration

#### "Logic -> Mic Arbitration"

In a situation where a microphone source is shared between multiple studios, the "Mic Arbitration" function can be used to manage which system has control of the remote microphone amplifier settings (gain, 48V, etc.).



In the example above, a microphone connected to the Nova17 from the announcer's booth is to be controlled from either of the two crystal Studio consoles. In this example, the Nova17 is the server and the two crystal consoles are clients.

#### **Network Control**

The system works by defining a <u>Mic Arbitration</u> Logic element for the microphone. You can define up to 8 sources which may take control of the microphone. When the **Condition** signal for a source is true, then the source takes control of the mic input parameters.

### Audio Distribution

To distribute the microphone signal from the Nova17, you can use either of the following methods:

- A direct MADI to MADI connection where the microphone signal is available to both crystal Studios simultaneously. The advantage and disadvantage of this method is that one studio may have access to the mic signal without control.
- Alternatively, configure an audio switch within the Nova17 (e.g. using a <u>Priconnect</u>) which is controlled by the same condition signal as the Mic Arbitration. The advantage of this method is that when control is switched so is the audio so that you can be sure you will never have audio without control.



## **TCP/IP Configuration**

The first step is to configure the TCP/IP links within the server and client system configurations as follows.

**1.** Within the server's configuration, set the "System -> Definition -> Parameter = TCP Link" modes to **GNET** for the links to the clients:

• Treedefinition: / S	System / Definition / Parameter = TCP Link															- • ×
Name	Value	^	Audio	Logic	OAC	TCP	Alarm	DMS	Matrix	EmBER+	Proje	ct Loopbad	GT	In	GT Out	
✓ System			-		Γ.					1	-					
✓ Definition			Paramete	r		TCP Link					_					
> Parameter	Aux		Active TC	P Connecti	on 1	192.167.1	101.241			P	Mode G	NET				Send Context
> Audio	Internal		Active TC	P Connecti		192.167.1	101 242			í ,	Mode G	NET				Send Context
> Parameter	Settings					192.107.1	101.242			1		INC I				
> Parameter			Active TC	P Connecti	on 3					1	Mode					Send Context
> Parameter			Active TC	P Connecti	on 4					•	4ode					Send Context
> Parameter										1						
> Parameter			Active TC	P Connecti	on 5					j	Mode					Send Context
> Parameter			Active TC	P Connecti	on 6					1	4ode					Send Context
> Parameter		_	Active TC	P Connecti						i .	Mode					Send Context
> Parameter			Acuveric	r connecu						1						
> Parameter			Active TC	P Connecti	on 8					1	Mode					Send Context
> Parameter			Active TC	P Connecti	nn 9 [					,	4ode					Send Context
> Parameter > Parameter					F					1	-					
> Parameter > Parameter			Active TC	P Connecti	on 10					1	Mode					Send Context
> Parameter			Active TC	P Connecti	on 11					1	Mode					Send Context
> Parameter	Logic Snapshot		A - No. TO	P Connecti	12					i .	Mode					Send Context
> Parameter			Active TC	P Connecto						j						
> Parameter			Active TC	P Connecti	on 13					L. L	Mode					Send Context
> Parameter			Active TC	P Connecti	n 14					1	Node					Send Context
> Parameter										1						
> Parameter			Active TC	P Connecti	on 15					1	Mode					Send Context
> Parameter	Aux Bus Menu		Active TC	P Connecti	on 16					•	Mode					Send Context
> Parameter	VCA Group Menu		External F		Ē					]						
> Parameter	Mic AutoGain				Ļ					]	Мар					
> Parameter	Matrix EmBER +		External F	Router 2												
> Parameter			Surface o	ver TCP	Г	-										
> Parameter	Local Providers		Canade o		,											
> Parameter	Description															

2. Within each client's configuration, set the "System -> Definition -> Parameter = TCP Link" mode to GNET (or GKPF):

• Treedefinition: / System / Definiti	ion / Parameter = TCP Link															- • •
Name	Value ^	A	Audio	Logic O	AC	тср	Alarm	DMS	Matrix	EmBER+	Proj	ect	Loopback	GT In	GT Out	
✓ System		-			Тог	Link										
<ul> <li>Definition</li> </ul>		Pa	rameter			LINK					-					
> Parameter	Aux	Ac	tive TCF	Connection	192	. 167. 1	01.240				Mode	GNET				Send Context
> Audio	Internal	1	tive TCE	Connection 2							Mode					Send Context
> Parameter	Settings	- MC	uve for	Connection .							Houe					
> Parameter	Sync	Ac	tive TCF	Connection							Mode					Send Context
> Parameter	Madi	Ac	tive TCF	Connection							Mode					Send Context
> Parameter	Meter	<sup></sup>		Connection												
> Parameter	Fader	Ac	tive TCF	Connection	i						Mode					Send Context
> Parameter	Snapshot	Ac	tive TCF	Connection 6							Mode					Send Context
> Parameter	OnAirControl														_	
> Parameter	TCP Link	Ac	tive TCF	Connection							Mode					Send Context 🗖
> Parameter	Timer	Ac	tive TCF	Connection 8							Mode					Send Context
> Parameter	Screen															

For more details on TCP/IP link types, please see Preparing the TCP/IP Connections.

If the microphone to be controlled is connected locally to one of the consoles, then you will need to configure a special TCP/IP Link mode for the server - in Step 1, set the "System -> Definition -> Parameter = TCP Link" mode to **GLOC** (GNET Local), and enter the IP Address for the **Active TCP Connection** to **127.0.0.1** or **localhost**.

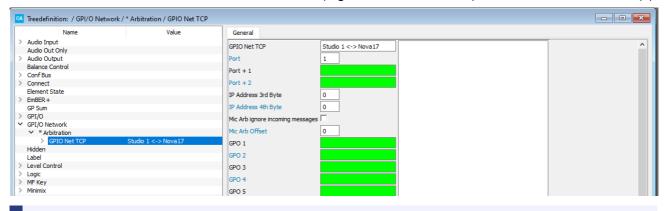


### **GPI/O Network Configuration**

Next, to transfer the "Mic Arbitration" control data, you must configure a <u>GPI/O Network</u> port between the server and each of the client systems. Note that the "Mic Arbitration" data is transmitted transparently. In other words, it does not use up any of the 32 configurable GPIOs or 10 level controls.

1. Within the first client, select the **GPI/O Network** branch of the 'Tree Definition' and Insert a **Net** element in the usual manner.

2. Name the GPI/O Network Port in the Net box (e.g. Studio 1<->Nova17) and enter the Port number (1):



If Port 1 is already in use (for a different application), you should choose the next available port number.

3. Repeat for the second client, this time entering a different Port number (2):

Treedefinition: / GPI/O Network /	* Arbitration / GPIO Net TCP = Stu	idio 1 <-> Nova17			- • •
Name	Value	General			
> Audio Input		GPIO Net TCP	Studio 2 <-> Nova17	[	
Audio Out Only		GPIO NET TCP	Studio 2 <-> Nova17		
> Audio Output		Port	2		
Balance Control		Port + 1			
> Conf Bus					
> Connect		Port + 2			
Element State		IP Address 3rd Byte	0		
> EmBER+		1			
GP Sum		IP Address 4th Byte	0		
> GPI/O		Mic Arb ignore incoming messages			
✓ GPI/O Network					
<ul> <li>* Arbitration</li> </ul>		Mic Arb Offset	0		
	Studio 2 <-> Nova17	GPO 1			
Hidden		GPO 2			
Label		GPU 2			
> Level Control		GPO 3			

- 4. Now open the server's configuration and add two GPI/O Network Net elements.
- 5. Enter Port number 1 for the connection to Studio 1 and Port number 2 for the connection to Studio 2:

OA Treedefinition: / GPI/O Network	/ * Arbitration / GPIO Net TCP = St	udio 2 <-> Nova17		
Name	Value	General		
> Audio Input		GPIO Net TCP	Nova 17 <-> Studio 2	^
Audio Out Only > Audio Output		Port	2	
Balance Control		Port + 1		
> Conf Bus > Connect		Port + 2		
Element State		IP Address 3rd Byte	0	
> EmBER + GP Sum		IP Address 4th Byte	0	
> GPI/O		Mic Arb ignore incoming messages		
GPI/O Network     * Arbitration		Mic Arb Offset	0	
> GPIO Net TCP	Nova 17 <-> Studio 1	GPO 1		
GPIO Net TCP Hidden	Nova 17 <-> Studio 2	GPO 2		
Label		GPO 3		
Level Control     Logic		GPO 4		

You can use the **Mic Arb Offset** field to apply an offset to the <u>Mic Arbitration Input</u> numbers (used by each client). Apply this to each GNET port within the server so that the mic arbitration input numbers for different consoles are discrete.



### Server - Mic Arbitration

Within the server's configuration, you now need to define a **Mic Arbitration** element (under the "**Logic**" branch of the 'Tree Definition').

Each element arbitrates the control of a single mic input between 8 different sources.

• Treedefinition: / Logic / * Arbitrati	on / Mic Arbitration				
Name	Value	General			
> Audio Input Audio Out Only		Mic Arbitration	Mic1		
> Audio Output		Mic Input	MIC 01.Inp		
Balance Control Conf Bus		Mic Input No. 1	101	Condition Arb_St1.Key	
> Connect		Mic Input No. 2	102	Condition Arb_St2.Key	
Element State EmBER+		Mic Input No. 3	0	Condition	
GP Sum		Mic Input No. 4	0	Condition	
> GPI/O > GPI/O Network		Mic Input No. 5	0	Condition	
Hidden		Mic Input No. 6	0	Condition	
Label  Level Control		Mic Input No. 7	0	Condition	
✓ Logic		Mic Input No. 8	0	Condition	
* Arbitration     Mic Arbitration	Mic1				
> * Clipboard	MICL				
> * Global					
> * Microphones					

Mic Arbitration	Reference name for the element.
Mic Input	Enter the physical mic input you wish to be controlled via arbitration.
Mic Input Nr 1 to 8	Enter a reference number which will be used to identify the microphone <u>later</u> within the client configurations. The <b>Mic Input Nr</b> can be any number but it must be unique.
Condition	When the condition is true, the source with the corresponding <b>Mic Input Nr</b> takes control of the mic input parameters.

#### Server - Audio Distribution

Still within the server configuration, the next step is to distribute the microphone signal to all of the client systems. In our example, we have used two direct MADI to MADI connections:

- 1. From the <u>System Core</u> configuration, open the IO parameters for the MADI port feeding the first client console, and assign the microphone input (Mic 01) as its **Default Audio** output.
- 2. Repeat for the MADI port feeding the second client console.



### **Client - Source Configuration**

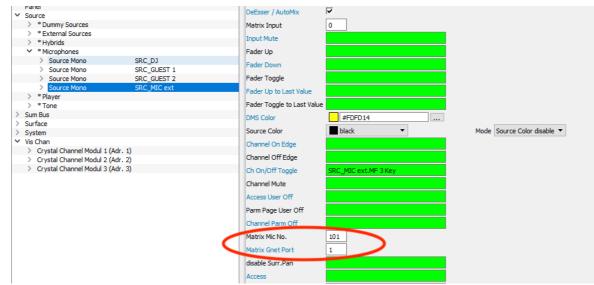
The final step is to add and configure the sources within each client configuration. This is done by opening the Source element you wish to configure:

**1.** Assign the **Audio Input** which will receive the incoming microphone signal – in our example, via the MADI link from the server.

2. In the Matrix Mic Nr box, enter the <u>reference number</u> you defined earlier within the server's configuration – in our example, 101.

If a **Mic Arb Offset** was entered within the server's <u>GPI/O Network</u> configuration, then the offset is applied here.

3. In the Matrix Gnet Port box, enter the GPI/O Network port number which connects to the Nova17 – in our example, port 1.



4. Repeat these steps for the second client, this time entering **102** for the **Matrix Mic Nr**, and port **2** for the **Matrix Gnet Port**.

✓ Source		DeEsser / AutoMix	l♥		
> * Dummy Sources		Matrix Input	0		
> * External Sources		Input Mute			
> * Hybrids					
<ul> <li>* Microphones</li> </ul>		Fader Up			
> Source Mono	SRC_DJ	Fader Down			
Source Mono     Source Mono	SRC_GUEST 1	Fader Toggle			
> Source Mono	SRC_GUEST 2 SRC_MIC ext				
> * Player	SKC_PIC EXC	Fader Up to Last Value			
> *Tone		Fader Toggle to Last Value	e		
> Sum Bus		DMS Color	#FDFD14		
> Surface					
> System		Source Color	black 👻	Mode Source Color disable 🔻	
Vis Chan		Channel On Edge			
> Crystal Channel Modul 1 (Adr. 1		Channel Off Edge			
<ul> <li>Crystal Channel Modul 2 (Adr. 2</li> <li>Crystal Channel Modul 3 (Adr. 3</li> </ul>					
Crystal Channel Modul 3 (Adr. 3	5)	Ch On/Off Toggle	SRC_MIC ext.MF 3 Key		
		Channel Mute			
		Access User Off			
		Parm Page User Off			
		Channel Parm Off			
		Matrix Mic No.	102		
	(				
		Matrix Gnet Port	2		
		disable Surran			
		Access			
		11.			

5. Save and download all of the server and client configurations.

You can now switch control of the microphone settings between clients by triggering the corresponding control signals - i.e. the **Condition** signals for **Mic Input Nr x** (defined in the servier's <u>Mic Arbitration</u> element).

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## 3.12.19 MOM LAT (Momentary Latch)

#### "Logic -> MOM LAT"

A MOM LAT element can be used to create a key that latches on (when you press quickly) or is momentary (when you press and hold). For example, to operate talkback.

#### **General Parameters**

Name	Value	General	
Audio Input		HOMINT	70
Audio Out Only		MOM LAT	ТВ
Audio Output		Toggle	TB 1.Key
Balance Control		Reset Static	
Conf Bus Connect		Set Static	
Element State		Reset Pos Edge	
EmBER+			
GP Sum		Set Pos Edge	
GPI/O		Delay Time (1/10 sec)	10
GPI/O Network		beidy time (1/10 bee)	
Hidden			
Label			
Level Control			
Logic			
✓ *Desk			
> Button 16	GPIO-Button		
> Gate	switch A/B		
> MOM LAT	TB		
> NOT	True		

MOM LAT	Reference name for the element.
Toggle	Assign the control signal which you wish to modify (in our example, a talkback key).
Reset Static	This input will force a reset (i.e. set the control output to "0"). The reset is active as long as the input control signal = logical "1".
Set Static	As above, but this time the control output is set to "1".
Reset Pos Edge	This input will force a reset (i.e. set the control output to "0"). The reset is triggered from the rising edge of the input control signal.
Set Pos Edge	As above, but this time the control output is set to "1".
Delay Time (1/10)	Enter the time between which the function will change from 'short press' to 'long press'. In our example, 10 is entered: pressing the TB key for more than 1 second will action a long press and for less than one second a short press.

The control outputs appear under the "Logic -> <GroupName> -> MOM LAT" branch of the 'Tree Selection' window:

Out	The control output (latching after a short press and momentary after a long press).					
nOut	he negated <b>Out</b> .					
OutShort TFF	Active when the <b>Toggle</b> input control signal is shorter than the <b>Delay Time</b> . It becomes inactive the next time the <b>Toggle</b> input control signal is shorter than the <b>Delay Time</b> .					
OutLong	Active when the <b>Toggle</b> input control signal is longer than the <b>Delay Time</b> . It becomes inactive when the <b>Toggle</b> input control signal becomes active.					
OutShort Pulse	This output is pulsed when the <b>Toggle</b> input control signal is active below the <b>Delay Time</b> .					

To program a **Talkback** key so that you press and hold to momentarily talk to a destination, use the **OutLong** control output to trigger the talkback function.

### 3.12.20 Mon Desk

#### "Logic -> Mon Desk"

The **Mon Desk** element supports a custom panel which monitors crosspoints within a large matrix. This is a project-specific feature. Please contact your local Lawo representative for further details.



## 3.12.21 MTX Src Pool

This feature allows operators to change the audio input assigned to a source directly from the control surface. The audio inputs must come from a remote matrix which can be a Nova73, Nova17, Nova29 or Matrix server.

A typical application would be to create 16 tie-line sources from a Nova73, where each "matrix source" can access one of the Nova73's input signals.

To use this feature, the **TCP Link** between the remote matrix and console must be configured in both systems under "<u>System -> Definition -> Param = TCPLink</u>" (as **KPF**, **GKPF** or **DKPF**). This feature is available for stereo sources only.

There are two parts to the configuration: the source parameters and Matrix Src Pool Logic element.

### Signal Naming & Organization

To support this feature, inputs within the remote matrix must be named using the the following naming convention: "Group:Signal". When using dynamic input switching, this provides a two-step navigation process: first select the Group, and then browse through all available Signals within that Group. Both the Group and Signal labels can be up to 8 characters.

By default, the signal labels are retrieved automatically from the networked router (if using NetCom or Remote MNOPL protocols).



### **Pool Source Parameters**

Start by adding some normal sources to the configuration.

- 1. Select the first source you wish to configure in the 'Tree Definition' and open the **Parm** tab.
- 2. Check that the Audio Input is assigned from the remote matrix (e.g. tie-line 1).
- 3. Configure the **Nova17/MTx Server** option.

Turn the option **On** if the remote matrix is a Nova17, Nova29 or Matrix Server.

Turn the option Off if the remote matrix is a Nova73 (for communication via Remote MNOPL).

4. Then assign a **Class/Pool** number.

When using a Nova17, Nova29 or Matrix Server, the number must match the **Pool ID** defined in the <u>MTx Source</u> <u>Pool</u> logic element. The pools can be used to divide signals within the matrix into different subsets. Each pool can be accessed from several sources by assigning the same **Pool** number.

When using a Nova73, enter the **Class** defined in the Nova73 map (as described in the "<u>ext\_router\_control\_en</u>" pdf).

5. Use the **Matrix Out 1** and **2** fields to enter the matrix output <u>number</u> connected to the source's audio input (in step 2).

This allows the Group and Signal labels for the output to be transferred from the remote matrix. Thus, the operator can browse through and select the correct signal from the console surface, see <u>Selecting a Matrix</u> <u>Pool Signal</u>.

• Treedefinition: / Sour	ce / * Desk / Source Stered	o = Nova17:	Src Poo	ы									- • ×
Name	Value	Parm	PFL	Conf	Down Src	Aux	Aux Switch	Keys					
> Audio Input													•
Audio Out Only		Source Ste	ereo		Nova17 Src P	00							-
> Audio Output		Display			Nova17								
Balance Control		Alias						=					
> Conf Bus								_					
> Connect		Class			Default								
Element State EmBER +		EmBER + L	.ocal Pro	ovider No	none		•						
GP Sum		SrcRepl El	lement N	lo.	none		-						
> GPI/O		SrcRepl N											
GPI/O Network					L								
Hidden		List Enable	e										
Label		Audio Inpi	ut		MTX Pool Tie I	line.L.In	n						
> Level Control					_		-						
> Logic		Limiter											
> MF Key		Compress	or										
> Minimix		Equalizer			<b>—</b>								
Panel					_								
✓ Source ✓ * Desk		Delay											
Source Mono		DeEsser/A	AutoMix										
> Source Mono		Nova17/M	Aby Corner	~	On		-		Class/Pool 1	Matrix Out 1 129	Matrix Out 2 0	Select 2	
> * Dummy Sources	10/01/ 3101/00	· ·								Matrix Out 1 125	Maarx Out 2 0	Select 2	
> * External Sources		RAVENNA			Off		-						
> * Hybrids		Input Mut	e										
> * Microphones													
> * Player		Fader Up											
> *Tone		Fader Dov	M										
> Sum Bus		Fader Tog	adle										
> Surface													
> System		Fader Up	to Last	Value									
> Vis Chan		Fader Tog	gle to L	ast Value									
		DMC Color	-		#EDED 1	4							

6. Repeat steps 1 to 5 for each matrix source you wish to configure.

Note that you can leave the **Class/Pool** field empty if you wish to "hard-wire" an input from the remote matrix. In this case, the label of the connected input (defined by the **Matrix Out 1** number) appears in the fader strip label display.



### Matrix Source Pool Logic Element

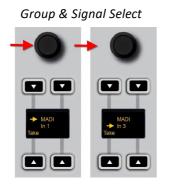
### "Logic -> MTx Src Pool"

The **MTx Src Pool** element defines the functionality of the Matrix Source Pools. Each pool can contain up to 64 signals. The element is defined under the "Logic" branch of the 'Tree Definition':

Treedefinition: / Logic / * Desk / MTX Src Pool						
Name i ^	General					
> Audio Input	MTX Src Pool Pool 1					
> Audio Out Only						
> Audio Output	Pool ID 1					
Balance Control Conf Bus	Src 01 1 Src 02 2 Src 03 3 Src 04					
> Connect	Src 05 Src 06 Src 07 Src 08					
Element State	Src 09 Src 10 Src 11 Src 12					
> EmBER+						
> GP Sum	Src 13 Src 14 Src 15 Src 16					
> GPI/O	Src 17 Src 18 Src 19 Src 20					
> GPI/O Network Hidden	Src 21 Src 22 Src 23 Src 24					
> Label	Src 25 Src 26 Src 27 Src 28					
> Level Control						
✓ Logic	Src 29 Src 30 Src 31 Src 32					
✓ *Desk	Src 33 Src 34 Src 35 Src 36					
> Button 16 > Gate	Src 37 Src 38 Src 39 Src 40					
> MOM LAT	Src 41 Src 42 Src 43 Src 44					
> MTX Src Pool						
> NOT	Src 45 Src 46 Src 47 Src 48					
> TB State	Src 49 Src 50 Src 51 Src 52					
> Text Prio	Src 53 Src 54 Src 55 Src 56					
> * Dispo						
* Extension Module     * Global	Src 57 Src 58 Src 59 Src 60					
> * Microphones	Src 61         Src 62         Src 63         Src 64					
> * Monitoring						
> * Off Air Record Bus Assignment						
> * Off Air Record Conference						
> * Redinht						
MTx Src Pool	Reference name for the element.					
Pool ID Enter the number for the matrix source pool. This must be a unique reference number						
	links the element to sources with a matching Class/Pool number.					
Src 01, Src 02. etc.	Enter the matrix address numbers for each remote input you wish to add to the source pool.					



### Selecting a Signal from the Surface





**1.** Press down on the fader strip rotary control to step through the input parameters until you reach the signal selection menu.

The display shows either the current Group and Signal name, or the text "not in pool".

2. Turn the rotary control to scroll through the available signal Groups and press down to make a selection.

**3.** Turn the rotary control again to scroll through all available Signals with the Group.

4. Once you are happy with the selection, press the **Take** button to assign the signal - the fader label display updates accordingly.

In our example, the three lines of text show the following information:

- **MADI =** the Group name (defined in the remote matrix).
- In 3 = the Signal name (defined in the remote matrix).
- **Nova17 =** the source Display Name (defined in the configuration).

## 3.12.22 MUX/DEMUX 8

#### "Logic -> MUX/DEMUX 8"

The **Mux/Demux8** element creates a 1-to-8 de-multiplexer and four 8-to-1 multiplexers. This is a project-specific feature. Please contact your local Lawo representative for further details.



## 3.12.23 NOT

#### "Logic -> NOT"

A NOT element is a simple logical gate for inverting a control signal:



### **Truth Table**

in	out
0	1
1	0

You can create a logical function whose result will always equal logical "1" by creating a **NOT** logic element with no input. The result of this will always be true, and therefore can be applied to parameters which need to be forced to true (logical "1") as a default.

### **General Parameters**

Name	Value	General		
Audio Input		NOT	Trourd	
Audio Out Only		NOT	TRUE	
Audio Output		In		
Balance Control				
> Conf Bus				
Connect				
Element State				
EmBER +				
GP Sum				
> GPI/O				
GPI/O Network				
Hidden				
> Label				
Level Control				
<ul> <li>Logic</li> </ul>				
✓ *Desk				
> NOT	TRUE			

NOT	Reference name for the element.			
In	Assigns the input signal to be inverted.			

The control output appears under the "Logic -> <GroupName> -> NOT" branch of the 'Tree Selection' window:



# 3.12.24 On Air Arbiter

## "Logic -> On Air Arbiter"

The **On Air Arbiter** element is a 1-out-of-8 selector switch designed for transmission line arbitration.

Up to 8 input (Key) signals can be defined, each with its own **Enabled**, **Prepared**, **Blink** and **Active** output. The operation is as follows:

1. Before an output can be made active, the corresponding **Enable** input signal must be True.

This allows you to protect the entire selector or individual outputs.

2. Once the **Enable** input is true, an operator can press and hold the corresponding **Unlock** button and press the **Key** button in order to prepare an output.

3. The operator must then press the **Key** button again to activate the output.

The output can only be activated if no other outputs are already active.

4. The output is deactivated if the **Enable** input signal becomes False.

This element controls the logic of the selector only and not the audio crosspoints.

Alternative elements are the <u>Feedback Arbiter</u> which is simpler in operation, and the <u>Enable Func</u> which provides signalisation but not arbitration.

## **General Parameters**

On Air	r Arbiter			
1	Unlock	Key	Enable	
2	Unlock	Key	Enable	
3	Unlock	Key	Enable	
4	Unlock	Key	Enable	
5	Unlock	Key	Enable	
6	Unlock	Key	Enable	
7	Unlock	Key	Enable	
8	Unlock	Key	Enable	

On Air Arbiter	Reference name for the element.
X – Unlock	Assigns the <b>Unlock</b> MF Key (or control input).
	Assigns the MF Key (or control input) which will prepare output x. The <b>Key</b> can only be selected if the <b>Enable</b> AND <b>Unlock</b> signals are true.
Enable	Assigns the <b>Enable</b> control signal. Unless this signal is true (static) the corresponding output cannot be prepared or activated.

The outputs appear under the "Logic -> <GroupName> -> OnAir Arbiter" branch of the 'Tree Selection' window:

x Enabled	True if the <b>Enable</b> input if True
x Prepared	True if the Enable AND Unlock AND Key inputs are true
x Active	True if the Prepared output AND Enabled AND Key inputs are True
x Blink	True if the <b>Prepared</b> output AND any other <b>Active</b> output are True.
nActive	True if no output is active.

# 3.12.25 OR32

## "Logic -> OR32"

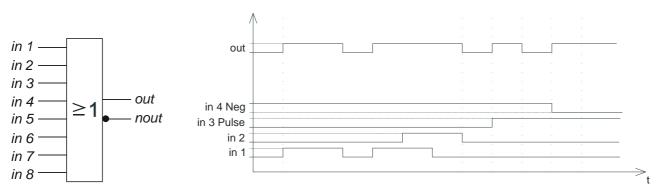
The **OR32** element is identical to the <u>OR8</u> but offers 32 inputs.



# 3.12.26 OR8

# "Logic -> OR8"

An OR8 element is a logical OR gate which offers 8 inputs. It can be used to 'OR' several signals:



## **Truth Table**

in 1	in 2	in 3	in 4	in 5	in 6	in 7	in 8	out	nout
0	0	0	0	0	0	0	0	0	1
1	х	х	х	х	х	х	х	1	0
х	1	х	х	х	х	х	х	1	0
х	х	1	х	х	х	х	х	1	0
х	х	х	1	х	х	х	х	1	0
х	х	х	х	1	х	х	х	1	0
x	х	х	х	х	1	х	х	1	0
x	x	х	х	х	x	1	x	1	0
x	x	х	x	х	x	х	1	1	0

## **General Parameters**

General		
OR8		
In 1	Neg 🗖	Pulse 🗖
In 2	Neg 🗖	Pulse 🗆
In 3	Neg 🗖	Pulse 🗖
In 4	Neg 🗖	Pulse 🗖
In 5	Neg 🗖	Pulse
In 6	Neg 🗖	Pulse 🗖
In 7	Neg 🗖	Pulse 🗖
In 8	Neg 🗖	Pulse

OR8	Reference name for the element.
In 1 to 8	Assigns input signals to each of the 8 inputs which are to be OR'd. Inputs which are not assigned are set to logical "0" or "FALSE".
Neg	When checked, the input is inverted before being processed by the OR gate.
Pulse	When checked, the input generates a pulse (of 32.5ms duration) before being processed by the OR gate. Use this option to convert a static signal to a pulse.

The control outputs appear under the "Logic -> <GroupName> -> OR8" branch of the 'Tree Selection' window:

Out	The OR output.
nOut	Negated OR.



# 3.12.27 PRIO

## "Logic -> PRIO"

The **PRIO** element is similar to a <u>Button 16</u> but with prioritised switching. It can be be used to create intercancelling button groups, where signal prioritisation is required. The element includes 16 inputs and 16 outputs, where In 1 has lowest priority and In 16 highest priority.

For example: If **In 1** is set to a logical "1", and all other inputs set to "0", then **Out 1** is active and all other outputs are set to "0". If **In 3** then becomes set to a logical "1", **Out 3** becomes active and **Out 1** is set back to logical "0". If **In 1** and **In 3** are both set to logical "1", then **In 3** has higher priority so **Out 3** is the active output.

## **General Parameters**

Name	Value	^	General	
Audio Input			PRIO	
Audio Out Only			PRIO	
Audio Output			In 1	
Balance Control			In 2	
> Conf Bus				
> Connect			In 3	
Element State			In 4	
EmBER+				
GP Sum			In 5	
> GPI/O			In 6	
GPI/O Network			In 7	
Hidden				
Label     Level Control			In 8	
			In 9	
✓ Logic ✓ * Desk		_		
> AND8			In 10	
> Button 16		_	In 11	
> MFF			In 12	
> NOT	TRUE			
> OR 32	11 Martin		In 13	
> OR8			In 14	
> On Air Arbiter				
> PRIO			In 15	
> * Extension Module			In 16	
> * Clobal				

PRIO	Reference name for the element.
	A rising edge at an input sets the corresponding control output to logical "1", and any other active control output to logical "0" providing it is of a lower priority. In 16 has highest priority.

The control outputs appear under the "Logic -> <GroupName> -> PRIO" branch of the 'Tree Selection' window. The default state after power on is logical "0" on all outputs.

## 3.12.28 RAVENNA Src Pool

This feature allows operators to change the stream assigned to a RAVENNA source directly from the control surface. There are two parts to the configuration: the RAVENNA Source parameters and RAVENNA Src Pool Logic element.





## Stream Naming & Organization

To support this feature, streams must be announced to the network using the following naming convention: "Group:Stream". When using dynamic input switching, this provides a two-step navigation process: first select the Group, and then browse through all available Streams within that Group. Both the Group and Stream labels can be up to 8 characters.

By default, the labels are retrieved automatically from the network. Streams with the same Group name are combined into a single Group even if they are provided by different devices. The list presented to the operator is updated automatically so that newly discovered streams are added, and streams which can no longer be detected are erased. To prevent access to certain streams, filters can be applied in the configuration.

In cases where streams cannot be named using the above convention, it is possible to map specific streams to pre-configured labels. In this instance, the list of streams presented to the operator is fixed and is independent of stream availability.

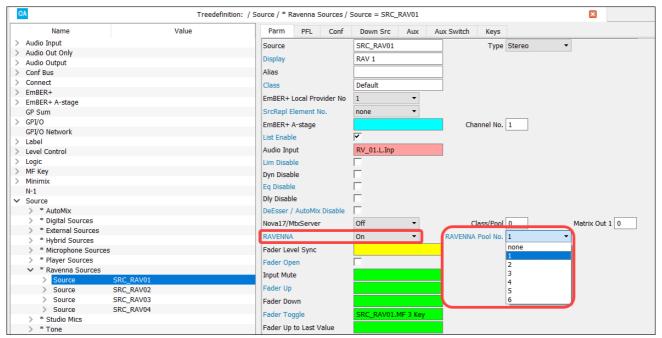
## **RAVENNA Source Parameters**

Start by adding some RAVENNA Sources to the configuration.

- 1. Select the first source you wish to configure in the 'Tree Definition' and open the **Parm** tab.
- 2. Check that the Audio Input is assigned from a RAVENNA streaming input.
- 3. Turn the **RAVENNA** option **ON** to enable the RAVENNA Pool stream selector.

4. Then assign a **RAVENNA Pool No.** from 1 to 6. This must match the **Pool No.** defined in the <u>RAVENNA Src Pool</u> Logic element.

The pools can be used to divide streams into different subsets. Each pool can be accessed from several RAVENNA sources by assigning the same **RAVENNA Pool No**. To present the operator with a single pool of streams, you can use the **None** option.



5. Repeat steps 1 to 4 for each RAVENNA source.



## **RAVENNA Src Pool Logic Element**

## "Logic -> RAVENNA Src Pool"

The **RAVENNA Src Pool** element defines the functionality of the RAVENNA Source Pools, whether they be static or dynamic and the application of filters. Up to 6 independent pools can be defined. The element is defined under the "Logic" branch of the 'Tree Definition':

C	A	Treedefinition: / Logic / * F	Ravenna Sources / RAVENNA	Src Pool = RAV_SRC_POOL_1	×
	Name	Value	General		
>	Audio Input		RAVENNA Src Pool	RAV_SRC_POOL_1	
>	Audio Out Only Audio Output		Pool No.	1 🔹	
5	Conf Bus		Pool Type	Dynamic 👻	
5	Connect		Node Name Filter	*	
>	EmBER+				
>	EmBER+ A-stage		Stream Group/Name Filter	*:*	
	GP Sum		Stream Size Filter	2 👻	
>	GPI/O		Reload Pool		
	GPI/O Network				
>	Label				
>	Level Control				
×	Logic				
	> * AutoMix > * Desk				
	> * Hybrid Sources				
	> * Machines				
	> * Microphone Sources				
	<ul> <li>* Ravenna Sources</li> </ul>				
	> RAVENNA Src Pool	RAV_SRC_POOL_1			
	> * Tone				
>	MF Key				
>	Minimix				
	N-1				
>	Source				
>	Sum Bus				
2	Surface				]
5	System Vis Chan				
11	vis chan				

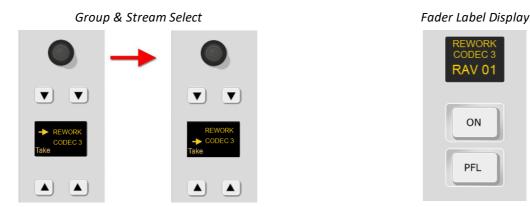
RAVENNA Src Pool	Reference name for the element.
Pool No.	Enter the RAVENNA Source Pool number: <b>None</b> or <b>1</b> to <b>6</b> . This links the element to <u>RAVENNA Sources</u> with a matching <b>RAVENNA Pool No</b> .
РооІ Туре	<ul> <li>Static or Dynamic:</li> <li>Dynamic is the more typical choice (shown above). It allows the pool to adjust dynamically to a changing stream structure.</li> <li>When Static is selected, two additional tabs appear where you can define fixed labels for up to 64 streams.</li> </ul>
Node Name Filter	Enter a node name filter to limit access to streams from a certain node, or enter the wildcard (*) to display streams from all nodes. Node names can be seen in the Web UI.
Stream Group/Name Filter	Enter the filter ":" to use the recommended stream naming convention "StreamGroup:StreamName". Other filters are possible.
Stream Size Filter	Apply a stream size filter to limit access to streams of a certain channel size: <b>None</b> (all formats), <b>1</b> (mono), <b>2</b> (stereo) or <b>8</b> (multi-channel).
Reload Pool	Enter a control signal to reload (refresh) the streams in the pool from the network.



If the **Pool Type** is set to **Static**, then the "Static Source List" pages appear. These can be used to define a fixed Group and Name label for up to 64 streams on the network. If the pool works in this mode, then the list of streams presented to the operator is fixed (static), and is independent of stream availability.

OA Tree	definition: / Logic / * Ravenna Sou	ces / RAVENN	A Src Pool = RA	V_SRC_PUOL_1			×			
Name Val	ue General	Static Source	ce List Page 1	Static Source List P	Page 2					
> Audio Input	Src01:	Local Group	PC 1	Local	I Name	RELAY01	R	AVENNA Source Label	C1_RELAY01	
> Audio Out Only	Src02:	Local Group	PC 1	Local	I Name	RELAY02	R	AVENNA Source Label	C1 RELAY02	_
> Audio Output > Conf Bus	Src03:	Local Group	-		L L	RELAY03		AVENNA Source Label	-	-
> Connect			L							-
> EmBER+	Src04:	Local Group			L L	RELAY04		AVENNA Source Label		_
> EmBER+ A-stage	Src05:	Local Group	PC 2	Local	I Name	RELAY01	R	AVENNA Source Label	C2_RELAY01	
GP Sum	Src06:	Local Group	PC 2	Local	I Name	RELAY02	R	AVENNA Source Label	C2_RELAY02	
> GPI/O	Src07:	Local Group	PC 2	Local	I Name	RELAY03	R	AVENNA Source Label	C2_RELAY03	
GPI/O Network Label	Src08:	Local Group	PC 2	Local	I Name	RELAY04	R	AVENNA Source Label	C2_RELAY04	
> Level Control	Src09:	Local Group		Local	I Name		R	AVENNA Source Label		—
<ul> <li>Logic</li> </ul>	Src10:	Local Group		Local	I Name		R	AVENNA Source Label		-
> * AutoMix	Src11:	Local Group	-		I Name			AVENNA Source Label	L	-
> * Desk										
> * Hybrid Sources > * Machines	Src12:	Local Group			I Name			AVENNA Source Label	L	
> * Microphone Sources	Src13:	Local Group		Local	Local Name	R	RAVENNA Source Label			
<ul> <li>Ravenna Sources</li> </ul>	Src14:	Local Group		Local		ie	R	RAVENNA Source Label		
RAVENNA Src Pool RAV_SRC_POOL_1	Src15:	Local Group		Local	I Name		R	AVENNA Source Label		
> * Tone	Src16:	Local Group		Local	I Name		R	AVENNA Source Label		
ocal Group	Enter a Group la	abel for	the stre	am.						
ocal Name	Enter a Name la	ter a Name label for the stream.								
RAVENNA Source Label	Enter the name	Enter the name of the stream (as it is announced to the network).								

## Selecting a Stream from the Surface



1. Press down on the fader strip rotary control to step through the input parameters until you reach the stream selection menu.

The display shows either the current Group and Stream name, or the text "not in pool".

- 2. Turn the rotary control to scroll through the available Groups and press down to make a selection.
- 3. Turn the rotary control again to scroll through all available Streams with that Group.

If your network supports dynamic stream detection, then the list of available streams updates automatically.

4. Once you are happy with the selection, press the **Take** button to start the subscription process.

There will be a brief pause in the audio while the streaming connection is configured. During this time, the connection status is shown in the fader label display. The display updates to show the stream name once the subscription is successful.

In our example, the three lines of text show the following information:

- **REWORK** = the Group name (detected from the network).
- **CODEC 3** = the Stream name (detected from the network).
- RAV 01 = the source Display Name (defined in the configuration).



## Stream Subscription: Status Messages

Whenever you subscribe to a stream, the fader strip label display reports back on the status of the connection.

Under normal circumstances, the expected sequence of messages is as follows:

"Mute" -> select a stream and press Take -> ("Pending") -> "Tuning" -> ("Unstable") -> "<Stream-Name>"

Note that messages shown in () may or may not appear. The table below explains the meaning of each message in more detail.

Status Message Meaning				
"Mute"	No stream is connected to the source's RAVENNA input.			
ACTION: select a str	eam via the rotary control and press <b>TAKE</b> .			
("Pending")	Appears IF the connected stream is not yet available. In this instance, the console will wait for the stream announcement to appear on the network, and then automatically initiate the subscription process. Typically, this message does not appear when selecting a stream from a RAVENNA source pool, as the list presented to the operator is constantly updated (in the background). The message can appear if the source has been configured using a default subscription, if a stream is connected via VSM, or following a warmstart while restoring the last known connection.			
"Tuning"	Appears while the console measures the streaming quality, and sets its stream receiving parameters to ensure correct audio playback. During the tuning cycle the audio input is muted, and then unmuted once the task is complete. If a stream is being received for the first time, then the tuning process can take a couple of seconds. This initial tuning information is stored in a permanent memory. It is then used whenever you select the same stream, thereby speeding up all subsequent connections.			
("Unstable")	<ul> <li>Appears IF the stream jitter is extremely high and cannot be dealt with; IF the stream stops for some reason; or IF the PTP clock information is missing. You can open the RAVENNA pages (in the Web UI) to view additional information on specifics.</li> <li>In this instance, the console will attempt to heal itself, and mute the audio input until the stream reaches stable conditions.</li> <li>Typically, it is very rare to see this message during the subscription phase.</li> <li>If an unstable stream is due to a PTP problem, then console will start a new "Tuning" cycle before the audio input is unmuted.</li> </ul>			
" <stream-name>"</stream-name>	Once the subscription is successful, the name of the connected stream is displayed.			

On rare occasions, the following error messages may also appear:

Status Message	Meaning
"PoolErr"	<ul> <li>Appears IF there is a problem connecting to the stream.</li> <li>This can occur if the selected stream is not available on the network any longer, but is still presented in the console's list of streams. Since this list is updated cyclically, the problem should not persist.</li> <li>If you see this error, please repeat the subscription process. If the issue persists, check your network settings.</li> <li>The audio input will be muted while the error message is displayed.</li> </ul>
"RavErr"	Appears IF there is an invalid combination of status flags for the RAVENNA stream. Since the flags are updated cyclically, the error should heal itself. If the issue persists, then check the RAVENNA pages (in the Web UI). The audio input will be muted while the error message is displayed.



# 3.12.29 RAVENNA Static Stream

## "Logic -> RAVENNA Static Stream"

This element can be used to configure a RAVENNA static stream. It is supported by Power Core systems only.

## **General Parameters**

The parameters vary depending on the **Connection Mode**, which can be set to either RTSP URL or Stream Parameters.

Connection Mode = RTSP URL

0	D.A.			Treedefinition: / Logic	/ * Ravenna Sources / RAVENNA Static Stream = StreamRTSP
		Name	Value	General	
>	Α	udio Input		RAVENNA Static Stream	StreamRTSP
>		udio Out Only		Disabled	
>	Α	udio Output			
	C	Conf Bus		Connection Mode	RTSP URL 🔻
>		Connect		RTSP IP Address 1	
>		mBER+		RTSP IP Address 2	
>		mBER+ ALine			
>		P Sum		RTSP Port No.	
>		PI/O		Stream Name	
>		PI/O Network			
>		abel			
>		evel Control			
~		ogic			
		> * AutoMix			
		> * Control			
		> * Desk			
		* Hybrid Sources * Machines	_		
		* Microphone Sources			
		* Networking	_		
		<ul> <li>* Ravenna Sources</li> </ul>			
			RAV		
		RAVENNA Static Stream			
		RAVENNA Static Stream			
		> * Tone	ou ou		
>		1F Key			
5		1inimix			

RAVENNA Static Stream Reference name for the element.		
Disabled Disables the transmission of the stream.		
Connection Mode Sets the connection mode.		
RTSP IP Address 1, 2 Enter the IP address for the RTSP URL.		
RTSP Port No. Enter the port number for the RTSP URL.		
Stream Name	Enter the stream name. The maximum length is 8 characters. If the stream is to be displayed on another ruby surface in a channel list, then the stream name must use the format [GroupName]:[SignalName], where each label field is a maximum of 8 characters. See <u>RAVENNA Pool Sources</u> .	



C	A			Treedefinition: / Logic / * Rave	enna Sources / RAVENNA Static Stream
		Name	Value	General	
>	Au	dio Input		RAVENNA Static Stream	ROH: SUM01
>	Au	lio Out Only		Disabled	
>	Au	lio Output			
	Cor	nf Bus		Connection Mode	Stream Paramete 🔻
>		nect		Stream Name	ROH: SUM01
>		BER+		Stream Size	2 -
>		BER+ ALine			
>	GP	Sum		Samples per Frame	48
>	GP1			Codec	L24 🔻
>		/O Network		Multicast IP Address 0	239.99.218.7
>	Lab				
>		el Control		Multicast Src IP Address 0	192.168.99.218
~	Log	ic		Multicast IP Address 1	239.98.218.7
	>	* AutoMix		Multicast Src IP Address 1	192.168.98.218
		* Control			
	>	* Desk		Multicast UDP Port No.	5004
	>	* Hybrid Sources		RTP Payload Type	98
	>	* Machines		Fixed Jitter Reserve [Samples] (0=none)	464
	>	* Microphone Sources		line side reserve [Sumples] (0-none)	
	~	* Ravenna Sources			
		> RAVENNA Src Pool	RAV		
		> RAVENNA Static Stream	ROH:		
	>	* Tone			

## Connection Mode = Stream Parameter

<b>RAVENNA Static Stream</b>	Reference name for the element.		
Disabled	Disables the transmission of the stream.		
Connection Mode	Sets the connection mode.		
Stream Name         Enter the stream name. The maximum length is 8 characters.           If the stream is to be displayed on another ruby surface in a channel list, then the str name must use the format [GroupName]:[SignalName], where each label field is a n of 8 characters. See RAVENNA Pool Sources.			
Stream Size	Defines the number of audio channels used by the stream.		
Samples per Frame	Sets the number of samples included in each Ethernet Frame. A frame is the payload being carried over the Ethernet link. The default value is 32.		
Codec	Selects the type of codec used for the stream: Linear 16, 24 or 32 bits; or AM824 (a packetized AES signal that includes all user and status bits).		
Multicast IP Address	Enter the multicast address. If the field is left blank, then a default multicast address is assigned. These fields provide your network architect with the ability to implement a specific IP multicast schema for your facility.		
Multicast Src IP Address	Enter the multicast source address.		
Multicast UDP Port No.	Reserved for Unicast. The default value is 5004.		
RTP Payload Type	Defines the RTP payload. The default value is 98.		
Flxed Jitter Reserve (Samples)	Can be used to define a fixed Time Offset for the stream (applied by the receiver during stream tuning). By default, the value is set to 0 (none) so that the stream is tuned as normal: either automatically or manually via the Power Core Web UI. See Stream Tuning. If a non-zero value is entered, then a fixed Time Offset is applied. See Defining a Fixed Time Offset.		



# 3.12.30 RAVENNA Stream Control

## "Logic -> RAVENNA Stream Control"

This element can be used to configure redundancy for specific RAVENNA inputs. It is supported by Power Core systems only.

Primary and backup streams are specified such that if the primary stream is lost or becomes unknown, then the backup stream will be connected.

For example, if the **Main Stream Name** (MSTR:Stream01) is lost, then within 30 seconds the **Backup Stream Name** (BKUP:Stream02) will be subscribed. In addition, you can use the **Auto Connect** control signal to ensure that the **Main Stream** (or **Backup Stream**) is always subscribed.

0	A Surface 🗵	OA Treedefinitio	n	: /Logic / *Desk / RAVENNA S	Stream Control 🗵 🛛 🔼	Inp
	Name	Value		General		
	Audio Input Audio Out Only			RAVENNA Stream Control	RED_Stream_IN	1
Þ	Audio Output			Input (RAV Core Out)	DFLT.In001.Ravenna Input	
	Balance Control			Main Stream Name	MSTR:Stream01	1
Þ	Conf Bus Connect			Backup Stream Name	BKUP:Stream01	1
	Element State			Stream Connect Timeout (s)	30	1
	EmBER+ GP Sum			Alarm Logging Enabled		
Þ	GPI/O			Auto Connect		
	GPI/O Network Hidden			Force Main Stream Connect		
⊳	Label			Force Backup Stream Connect	+	
	Level Control					
4	Logic ▷ * Default					
	⊿ *Desk					
Þ	RAVENNA Stream Control MF Key	RED_Stream_IN				
	Minimix					
	Panel					
	Ravenna Input Source					
Þ	Sum Bus					
Þ	Surface					
Þ	System					
⊳	Vis Chan					

RAVENNA Stream Control Reference name for the element.		
Input (RAV Core Out)	Enter the input that will be used to subscribe to the streams from the network.	
Main Stream Name	Enter the name of the Primary or Main stream exactly as it appears in the network.	
Backup Stream Name	Enter the name of the Backup or Alternate stream exactly as it appears in the network.	
Stream Connect Timeout         Enter a value from 1 to 300.           in seconds         Enter a value from 1 to 300.		
Alarm Logging Enabled	Enable whether these connections shall be logged via the Alarm Log Server.	
Auto Connect	Use this input to ensure that no other undefined streams may be subscribed to this Input. Any attempt to subscribe to a different stream will cause the <b>Main Stream</b> to be subscribed instead.	
Force Main Stream Connect	Forces the Main stream to be connected.	
Force Backup Stream Connect	Forces the Backup stream to be connected.	



The outputs appear under the "Logic" branch of the 'Tree Selection' window:

Treeselection
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<b>RAVENNA Stream Control</b>	Reference name for the element.	
Waiting for Stream	Waiting for the stream to connect.	
Stream Unstable	The stream connection is unstable.	
Main Stream connected The Main stream is connected.		
Backup Stream connected	The Backup stream is connected.	
Auto Connect active	Auto Connect active is true.	
Force Main Stream active	Force Main Stream active logic is true.	
Force Backup Stream active         Force Backup Stream active logic is true.		



# 3.12.31 Server based Timer

## "Logic -> Server based Timer"

Server-based timers can be used to synchronize the operation across multiple VisTools. If a parameter such as the timer direction, preset or alarm time is changed from one VisTool, then this is displayed in the other instances. The displayed time is also synchronized.

Up to 32 independent server-based timers can be configured.

**1.** Start by adding a **Server based Timer** element to the Logic branch of the 'Tree Definition', and enter a **Timer ID** number from 1 to 32.

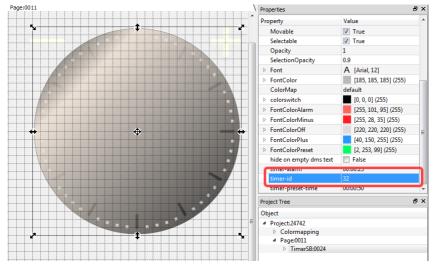
You can use the remaining fields to define how the timer is triggered.

OA	Treedefinition	: /Logic / * Desk / Server based Timer = Timer 32
Name	Value	General
Audio Input		Server based Timer 32
Audio Out Only		
Audio Output		Timer ID 32
Balance Control		Start
Conf Bus		
Connect		Stop
Element State		Restart
EmBER+		
GP Sum		Reset
GPI/O		Count Up
GPI/O Network		
Hidden		Count Down
Label		
Level Control		
4 Logic		
⊿ *Desk		
Server based Timer	Timer 32	
* Ravenna Sources		
MF Key		
Minimix		
Panel		
Ravenna Input		
Source		
Sum Bus		
Surface		
System		
Vis Chan		

ON-AIR Designer Server-based Timer (ID 32)

2. Then open VisTool Editor and insert a **Server based Timer** element in the usual manner. Edit the **Timer ID** in the 'Properties' panel to match the one entered in the ON-AIR Designer:

VisTool Editor Server-based Timer (linked to Timer 32)





# 3.12.32 ShiftReg 16

## "Logic -> ShiftReg 16"

A **ShiftReg16** element is a logical shift register with 16 outputs. It operates as a series of <u>flip flops</u> with 16 parallel outputs, where the output of one flip-flop is connected to the input of the next. They share a single clock signal which causes the data to shift from one flip-flop to the next. By connecting the last flip-flop back to the first, using **Ring Mode**, the data can cycle for extended periods.

## **General Parameters**

OA.	Treedefinition: / Logic / * Control / ShiftReg 16	×
Name Value	General	
Name     Value       > Audio Input     -       > Audio Out Only     -       > Audio Output     -       Conf Bus     -       > Connect     -       > EmBER+     -       > EmBER+ A-stage     -       > GPI/O     -       > GPI/O     -       > GPI/O     -       > GPI/O     -       > Label     -       > Label     -       > Logic     -       > * AutoMix     -       > NOT     TRUE       > ShiftReg 16     *       > * Microphone Sources       > * Microphone Sources       > * Tone	General ShiftReg 16 ShiftReg Input (static) Clock (pos. edge) Reset (static) Ring Mode	

ShiftReg 16 Enter a reference name for the element.	
Input (static) Assigns the data input which you wish to process.	
Clock (pos. edge) Assigns the clock source. If you leave this field empty, then the system clock will be use (approximately 60Hz).	
Reset (static) Sets all outputs to be false as long as Reset Static is active.	
Ring Mode Enable this option to connect the output of the last flip-flop back to the first (to cycle	

The control outputs appear under the "Logic -> <GroupName> -> ShiftReg 16" branch of the 'Tree Selection' window:

Output 1 to 16	The positive outputs 1 to 16.
nOutput 1 to 16	The negated outputs 1 to 16.



# 3.12.33 Static Network Route

## "Logic -> Static Network Route"

This element can be used to configure a static network route for the streaming ports (ra0 & ra1) or control ports (dwc0 & dwc1). It is supported by Power Core systems only.

## **General Parameters**

OA		Treedefinition: / Logic / * Control / Static Network Route	×	
Name	Value	General		
<ul> <li>&gt; Audio Input</li> <li>&gt; Audio Out Only</li> <li>&gt; Audio Output</li> <li>Connect</li> <li>&gt; EmBER+</li> <li>&gt; EmBER+ A-stage</li> <li>&gt; GP Sum</li> <li>&gt; GPI/O</li> <li>&gt; GPI/O Network</li> <li>&gt; Label</li> <li>&gt; Level Control</li> <li>&gt; Logic</li> <li>&gt; * AutoMix</li> <li>* Control</li> <li>&gt; NOT</li> </ul>	RUE	Static Network Route Network Route 1 Disabled Device Group Streaming (ra0,  Route Type Host Host Name Host IP Address Gateway Name Gateway IP Address		
Static Network Route	E	Enter a reference name for the element.		
Disabled	isabled Use this checkbox to disable the route.			
Device Group	Select the network interfaces which will be affected. You can choose either the streaming ports ( <b>ra0 &amp; ra1</b> ) or control ports ( <b>dwc0 &amp; dwc1</b> ).		I	
Route Type	S	Select the type of route: either Host or Subnet.		
Host Name / IP Address	s E	Enter the host name and IP address.		
Gateway Name / IP	Name / IP Enter the gateway name and IP address.			

Address



# 3.12.34 TB State

## "Logic -> TB State"

The **TB State** element can be used for talkback state signalisation. For example, to illuminate a TB key when another studio is calling.

# **General Parameters**

Name	↑ General	
Name Audio Input Audio OutPoly Audio OutPoly Audio Output Balance Control Conf Bus Connect Element State EmBER+ GPJ/O GPI/O Network Hidden GPI/O Network Hidden Level Control Level Control Logic * Desk Button 16 Gate MOM LAT NOT	General       TB State       Key       In       Afterglow (sec)       4	

TB State	Reference name for the element.			
Кеу	Assigns the MF Key you wish to use to signalise the talkback state.			
In	Assigns the logic control signal for the incoming call.			
Afterglow (sec)	Enter the time in seconds before the key light will extinguish after the incoming call has ceased. Note that this time is approximate.			

The control outputs appear under the "Logic -> <GroupName> -> TB State" branch of the 'Tree Selection' window:

out.active	rue when the <b>Key</b> is active (i.e. the TB button is pressed).			
in.active	True when the incoming call (In control signal) or Afterglow are active.			
enable	True when the <b>Key</b> is not is use (i.e. TB is not in use.)			



# 3.12.35 Text Prio

## "Logic -> Text Prio"

The Text Prio element can be used to dynamically change the labels on any key panel with LCD buttons.

LCD buttons may also be dynamically re-labeled using the **zirkonlabel** software.

Each label can display two lines of text (**Text A** and **Text B**), or displays a source/sum **Label**, and be switched between 16 text strings using logical control inputs.

## **General Parameters**

Name	Value	↑ General			
Audio Input		Text Prio TextPrio	1		
<ul> <li>Audio Out Only</li> </ul>					
Audio Output		In 1	Text A Line 1	Text B Line 2	Label
Balance Control		In 2	Text A	Text B	Label
Conf Bus Connect		In 3	Text A	Text B	Label
> * Desk					
> * Headphones		In 4	Text A	Text B	Label
> * Main Bus		In 5	Text A	Text B	Label
✓ * Monitoring		In 6	Text A	Text B	Label
> Priconnect	PC SPK OUT L	11.0			
> Priconnect	PC_SPK OUT R	In 7	Text A	Text B	Label
Priconnect	PC_SPK PFL L	In 8	Text A	Text B	Label
> Priconnect	PC_SPK PFL R				Label
> Priconnect	TB Insert	In 9	Text A	Text B	
> TConn64	TC_MON SELECT	In 10	Text A	Text B	Label
* Off Air Record * Talkback		In 11	Text A	Text B	Label
Element State					
Element State		In 12	Text A	Text B	Label
GP Sum		In 13	Text A	Text B	Label
GPI/O		In 14	Text A	Text B	Label
GPI/O Network					
Hidden		In 15	Text A	Text B	Label
Label		In 16	Text A	Text B	Label
Level Control					
Logic					
✓ * Desk					
> Button 16	GPIO-Button				
> Gate	switch A/B				
> MOM LAT	TB				
NOT TB State	True				
> Text Prio	TextPrio 1				

Text Prio	Enter a reference name for the element.			
In 1 to In 16	Assigns input control signals for the text strings 1 to 16. The control signals are prioritised from 1 (highest) to 16 (lowest) if more than one input is active.			
Text A	Enter the text which will appear in Line 1 of the LCD button label when its control input is active. Up to 6 characters.			
Text B	Enter the text which will appear in Line 2 of the LCD button label when its control input is active. Up to 6 characters.			
Label	Assigns the source or sum label which will appear on the LCD button when its control input is active. This field replaces <b>Text A</b> and <b>Text B</b> if assigned.			



Once named, the Text Prio output (**Text Out**) appears within the 'Tree Selection' when assigning a Label parameter. This allows it to be assigned to the <u>Label ID</u> of a key panel LCD button. The button label will then follow the definitions made within the **Text Prio** logic element:

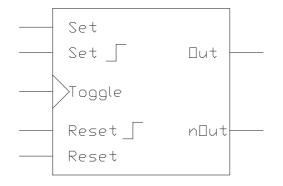
OA Panels							Treeselection	?	×
					<b></b> ó ó	<b>)</b>	Label     * AES Sources     * Desk     > EmBER + Orban CODEC CODEC1		
OA Parameter:	KSC-LCD14P2-F	GB Module 1 (Adr	. 1)			×	Text Prio textprio 1     Text Out		
Keys 18 Page	e 1 Keys 91	4 Page 1 Keys 1	8 Page 2 Keys 914 Pa	age 2 Keys 18 Pag	je 3 Keys 914 Page 3	3			
Page 1 Key 1 Name Line 1 Name Line 2				Label ID textprio 1.	Text Out		> * Line Sources > * Microphones > * Tone > * Visualisation		
P1 Color	green	•	Blink	Logic					
P2 Color	yellow	-	Blink 🗔	Logic					
P3 Color	red	*	Blink 🗖	Logic					
P4 Color	black	-	Blink	Logic					
P4 Color Page 1 Key 2	black	•	Blink	Logic					



# 3.12.36 TFF (Toggle Flip Flop)

## "Logic -> TFF"

A **TFF** element is a Toggle Flip Flop. When a positive edge arrives at the input signal, this triggers a change of state at the output. A common application is to create a latching MF Key.



## **General Parameters**

Name	Value	^	General	
> Priconnect	PC_SPK PFL L			
> Priconnect	PC_SPK PFL R		TFF	Monitor MUTE
> Priconnect	TB Insert		Toggle	Mute.Key
> TConn64	TC_MON SELECT		Reset Static	
> * Off Air Record			and the second s	
> *Talkback			Set Static	
Element State			Reset Pos Edge	
EmBER+			and the second second	
GP Sum			Set Pos Edge	
GPI/O				
GPI/O Network				
Hidden				
Label				
Level Control				
' Logic				
> *Desk				
> * Dispo				
* Extension Module				
> * Global				
Microphones				
✓ * Monitoring				
> Button 16	BT16_MON SEL PGM			
> Button 16	STUDIO SEL			
> Gate	GT_MON SEL IN 1			
> Gate	GT_MON SEL IN 2			
> Gate	GT_MON SEL OUT 1			
> Gate	GT_MON SEL OUT 2			
> MOM LAT	ML_SPK DIM			
> MOM LAT	ML_SPK MUTE			
> OR8	OR_REC MODE P			
> TEF	Monitor MUTE			
> TFF	TFF_SPK MONO			
> TFF > TFF	TFF_SPK PHASE TFF_SPK SIDE			

TFF	Reference name for the element.			
Toggle	Assigns the input control signal to be toggled.			
Reset Static	This input control signal will force a reset (i.e. set the control output to "0"). The reset is active as long as the input control signal = logical "1".			
Set Static	As above, but this time the control output is set to "1".			
Reset Pos Edge	This input control signal will force a reset (i.e. set the control output to "0"). The reset is riggered from the rising edge of the input control signal.			
Set Pos Edge	As above, but this time the control output is set to "1".			
The control outputs appear under the "Logic -> <groupname> -&gt; TFF" branch of the 'Tree Selection' window:</groupname>				
Out	The TFF output.			

nOut

Negated TFF.



# 3.12.37 VispageSwitch

#### "Logic -> VispageSwitch"

A VispageSwitch element can be used to configure MF Keys, or other control signals, to action VisTool logical functions. For example, to create page switching buttons, snapshot save/load/delete and User Access Rights.

VispageSwitch elements are added to the "Logic" branch of the 'Tree Definition'. You should define an element for each VisTool screen, and set the Station ID to match the Station ID defined in VisTool's Session Management window. Any VisTool screen set to a matching Station ID will then respond to the VispageSwitch functions.

To enable VisTool page switching and snapshot functions you must tick the EnablePageKey and EnableLoadSave checkboxes within the VisTool Editor "Global Settings" window. VisTool page switching and snapshot functions can also be configured using the "System -> Definition -> Parameter = Screen" and "System -> Definition -> Parameter = Snapshot" elements. These methods switch all VisTool screens regardless of their Station ID.

The Nova29 does not support snapshots.

Each VispageSwitch element supports four sets of parameters: Logic, Snapshots, Rights and Labels.

#### OA Treedefinition: / Logic / \* VisTool MK2 / VispageSwitch = VPS\_MAIN SCREEN × Name Value Logic Snapshots Rights Labels Audio Input VispageSwitch > Audio Out Only Station ID 1 Audio Output Default Page 1 Balance Contro Clear Rights on Start Conf Bus > Connect Load PC Snap Element State Save PC Snap > EmBER+ Delete PC Snap EmBER+ A-stage Save PC Source Snap GP Sum GPI/O PC Log-In GPI/O Network PC-Log-Out Hidden Edit PC Labels > Label Application Full Screen Level Control Logic Application WindowPos × Application Minimize > \* Desk Application Close \* Global Mute RFID Tag Reader > \* Metering Disable RFID Tag Reader \* Microphone Sources > \* Monitoring Select 1 \* Ravenna Sources Select 2 > \* Redlight Select 3 \* Talkback ✓ \* VisTool MK2 Select 4 Select 5 > AND8 AND SRC ASSIGN Button 16 BT16\_AUX FADER SELECT Select 6 OR\_ACCESS ACTIVE OR8 Select 7 OR8 OR\_Page\_ACCESS Select 8 OR8 OR\_Page\_FADER Select 9 OR\_Page\_IN\_PATCH OR8 OR8 OR\_Page\_METER Select 10 TFF TFF\_ACCESS ACTIVE Select 11 TEE TFF\_SHOW CLOCK LARGE Select 12 Visi SCREEN Select 13 Matrix 128\*128 Control Module 2 (Adr. 2) Matrix 128\*128 Control Module 3 (Adr. 3) Select 14

## VispageSwitch -> Logic Parameters

Vispage Switch	Reference name for the element.
	Assigns an ID number to the element. Any VisTool screen set to a matching <b>Station ID</b> (in VisTool Sessions) will respond to the VispageSwitch functions.



Access Group	This option assigns an Access Group to the element. Access Groups are supported by Power Core Max to link the control surface ACCESS keys to different VisTool instances. Any Fader Modules set to a matching Access Group will respond to the corresponding VispageSwitch functions.
Default Page	This page appears on the VisTool screen following a cold start of the remote system. You should enter the number which corresponds to the page index within the VisTool Editor configuration.
Clear Rights on Start	If checked, defined user rights are reset after a warm start (e.g. a power cycle). If not checked, user rights will remain intact.
	Note that you must be using VisTool MK2 to support the user rights system.
Load PC Snap	When this control signal is active, a window opens on the VisTool screen to load a snapshot.
Save PC Snap	As above, but to save a snapshot.
Delete PC Snap	As above, but to delete a snapshot.
Save PC Source Snap	As above, but to save a source snapshot.
PC Log-In	When this control signal is active, the user log in window opens on the VisTool screen. You must activate this function to provide access to the user rights supported by VisTool MK2. The function should only be active on a single VisTool screen - i.e. for one VispageSwitch element mapped to one Station Id.
PC Log-Out	As above, but the control signal logouts the current user.
Edit PC Labels	When this control signal is active, the user label edit window opens on the VisTool screen.
Application Full Screen	Sets the application to full screen view.
Application WindowPos	Toggles the application between full screen and minimized.
Application Minimize	Minimizes the application.
Application Close	Closes the application.
Mute RFID Tag Reader	Mutes the RFID Tag Reader. The RFID Tag Reader is an optional Add On for VisTool MK2 which permits user login via an RFID tag. This control signal can be used to mute the reader.
Disable RFID Tag Reader	As above, but the control signal disables the RFID Tag Reader.
Select 1 to 32	When the <b>Select 1</b> control signal is active, the VisTool screen is switched to page 1, where page 1 is the page index within the VisTool Editor configuration. When the <b>Select 2</b> control signal is active, the VisTool screen is switched to page 2. And so on up to page 32.

The following control outputs appear under "Logic -> <GroupName> -> VispageSwitch" in the 'Tree Selection' window:

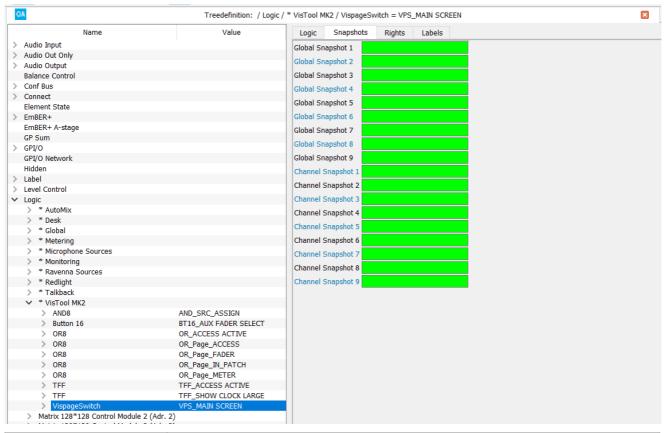
Selected 1	True when Page 1 is selected.
Selected 2	True when Page 2 is selected.
etc.	Etc. up to 32.

Use the **Selected 1** to **32** outputs as feedback to the control signal (for example, to light the MF Key which switched the page).



## VispageSwitch -> Snapshot Parameters

These parameters assign control signals to the nine Global/Channel snapshot buttons:



1 to 9	When this control signal is active, the corresponding global snapshot is loaded. The 9 Global Snapshot buttons can load any Full snapshot. The assignment of snapshots to buttons is made in the Edit Snaps window.
	As above, but Channel snapshot buttons can load any Src snapshot with a matching Class field.

The control outputs appear under "Logic -> <GroupName> -> VispageSwitch" in the 'Tree Selection' window:

GlbSnap n defined	True when global Snapshot n is defined within the user rights system supported by VisTool MK2.
ChanSnap n defined	True when channel Snapshot n is defined within the user rights system supported by VisTool MK2.



## VispageSwitch -> Rights Parameters

These parameters name each of the user access rights supported by VisTool MK2.

You should *only* name Rights for the same **VispageSwitch** element which opens the user log-in window (via <u>PC Log-In</u>). Otherwise you will not be able to access the rights from the user management Admin pages!

The name in the 'Tree Definition' is a reference name only; up to 32 Rights may be defined:

OA.	Treedefinition: / Logic	:/*VisTool MK2/	VispageSwi	tch = VPS_	MAIN SCREEN		×
Name	Value	Logic S	napshots	Rights	Labels		
> Audio Input		Right 1	DSP Pa	rm		1	
> Audio Out Only		Right 2	Channe			1	
> Audio Output						1	
Balance Control		Right 3	Access	Enable			
> Conf Bus		Right 4	Local S	napshot			
> Connect		Right 5	Extensi	on Module			
Element State		-		onnoune		]	
> EmBER+		Right 6					
EmBER+ A-stage GP Sum		Right 7					
> GPI/O		Right 8					
GPI/O Network		Right 9					
Hidden						]	
> Label		Right 10				]	
> Level Control		Right 11					
✓ Logic		Right 12					
> * AutoMix		Right 13					
> * Desk		Right 14				1	
> * Global						1	
> * Metering		Right 15					
> * Microphone Sources		Right 16					
> * Monitoring		Right 17					
> * Ravenna Sources						]	
> * Redlight		Right 18				]	
* Talkback     VisTool MK2		Right 19					
> AND8	AND_SRC_ASSIGN	Right 20					
> Button 16	BT16_AUX FADER SELECT	Right 21					
> OR8	OR ACCESS ACTIVE					]	
> OR8	OR_Page_ACCESS	Right 22					
> OR8	OR_Page_FADER	Right 23					
> OR8	OR_Page_IN_PATCH	Right 24					
> OR8	OR_Page_METER	Right 25					
> TFF	TFF_ACCESS ACTIVE					]	
> TFF	TFF_SHOW CLOCK LARGE	Right 26				]	
VispageSwitch	VPS_MAIN SCREEN	Right 27					
Matrix 128*128 Control Module 2 (Adr.	2)	Right 28					

Once named, the control outputs appear under "Logic -> <GroupName> -> Right" in the 'Tree Selection' window. For each right, there are two states: granted and denied:

Right 1 Granted	True when user permission is granted (defined by the User Group Rights administrator).
Right 1 Denied	True when user permission is denied.
etc.	etc. up to 32.



## Example of "Rights" Configuration

The naming of the user "Right" simply makes it appear in the User Group Rights Admin pages. To define what each "Right" does, you must configure the appropriate 'Tree Definition' functions.

In our example, **Right 3** (named **Access Enable**) allows permitted users to select the **ACCESS** button. If users are denied access to this right, then they cannot select **ACCESS** and the source cannot be assigned to the center section.

To configure this example, assign the **Denied** control output for user **Right 3** to the **Access User Off** function. If you wish to apply this to every source and sum bus, then repeat for every source and sum in the configuration:

Treedefinition: / Source / * AES Sources / So	ource Stereo = SRC_AES 01				
Name Value	Parm PFL Conf	Down Src Aux Aux Switch	Keys	Le Treeselection	7 X
> Audio Input		[	1		
> Audio Out Only	Source Stereo	SRC_AES 01		EmBER+	^
> Audio Output	Display	AES 1		GPI/O	
Balance Control	Alias		1	V Logic	
✓ Conf Bus	Allas			* AES Sources	
✓ *Desk	Class	Default		> * Aux Bus	
ConfBus Mono CB_DJ	EmBER + Local Provider No	none 🔻	-	> *Desk	
> Connect				> * Dispo	
Element State	SrcRepl Element No.	none 🔻		* Extension Module	
> EmBER+	SrcRepl Name	5	7	> * Global	
> GP Sum		7	_	> * Groups	
> GPI/O	List Enable			> * Headphones	
> GPI/O Network	Audio Input	AES 01.L.Inp		> * Hybrids	
Hidden	Lim Op Disable		-	> *Line Sources	
> Label	Lim Op Disable			> * Main Bus	
> Level Control	Dyn Op Disable			> * Microphones	
> Logic	Eq Op Disable	Γ		> * Monitoring	
> MF Key		_		<ul> <li>* Off Air Record</li> <li>* Off Air Record Bus Assignment</li> </ul>	
> Minimix	Dly Op Disable			* Off Air Record Conference	
> Panel	DeEsser/AutoMix	Г		> *Redight	
✓ Source				> * Special Functions	
ALLO OOCH CCS	Nova17/MtxServer	Off 👻	Class/Pool 0	> * Split Mode	
Source Stereo SRC_AES 01	RAVENNA	Off 👻		> * Studio	
Source Stereo SRC_AES 02 Source States SRC_AES 03	Ender Onen			> * Talkback	
Source Stereo SRC AES 04	Fader Open			> *Tone	
<ul> <li>Source Stereo SRC_AES 04</li> <li>Source Stereo SRC_AES 05</li> </ul>	Input Mute			> * User Configuration	
Source Stereo SRC_AES 05	Fader Up			<ul> <li>* Visualisation</li> </ul>	
> Source Stereo SRC AES 07	and the second			> OR8	OR_ACTIVE MAIN
> Source Stereo SRC_AES 08	Fader Down	AND_REC nACTVE AES01.Out		> OR8	OR ACTIVE MENU DYN
> *Desk	Fader Toggle	SRC_AES 01.MF 3 Key		> OR8	OR ACTIVE MENU EQ
> * Groups	and the second s			> OR8	OR_ACTIVE MENU INPUT
> *Hybrids	Fader Up to Last Value			> OR8	OR_ACTIVE MENU LIM
> *Line Sources	Fader Toggle to Last Value			> OR8	OR_CHAN. ASSIGN
> * Microphones	Hold Mode			> OR8	OR_CHAN, HOME
> * Monitoring			•	> Right 1	DSP Parm
> *Tone	Default Pos (dB)	0		> Right 2	Channel Parm
> Sum Bus	DMS Color	#FDFD14	1	✓ Right 3	Access Enable
> Surface				Granted	
> System	Source Color	black 🔻	Mode Source Color disable	Denied	
> Vis Chan	Channel On Edge			Right 4	Local Snapshot
	Channel Off Edge			> Right 5	Extension Module
				> VispageSwitch	VPS_CHAN. SCREEN 01
	Ch On/Off Toggle			> VispageSwitch	VPS_CHAN. SCREEN 03
	Channel Mute			VispageSwitch     VispageSwitch	VPS_CHAN. SCREEN 04
	Contraction of the second s			> DMS 1	VPS_MAIN SCREEN
	Access user Off		$\boldsymbol{<}$	> Definition	
	Parm Page User Off	Access Enable.Denied		Fader Module (full) 955/10 01 (Adr. 01)	
	Channel off	DSP Parm Denied		Fader Module (full) 955/10 01 (Adr. 01)	
				Fader Module (full) 955/10 03 (Adr. 03)	
	Ref Src			> Fader Module (full) 955/10 04 (Adr. 04)	
	Matrix Mic No.	0		> GT 1	
	Matrix Gnet Port	0		Screen Src Assian Module 14 (Adr. F)	~
	Maulx Ghet Port	0			OK Cancel



# VispageSwitch -> Labels Parameters

# These parameters can be used to label the 32 user Rights described earlier.

Name	Value	Logic Snapshots Rights Labels	
> Audio Input		Label 1	
> Audio Out Only			
> Audio Output		Label 2	
Balance Control		Label 3	
> Conf Bus		Label 4	
> Connect			
Element State		Label 5	
EmBER+		Label 6	
EmBER+ A-stage		Label 7	
GP Sum			
> GPI/O		Label 8	
GPI/O Network		Label 9	
Hidden		Label 10	
> Label			
> Level Control		Label 11	
<ul> <li>Logic</li> </ul>		Label 12	
> * AutoMix		Label 13	
> * Desk			
> * Global		Label 14	
> * Metering		Label 15	
* Microphone Sources		Label 16	
> * Monitoring			
* Ravenna Sources		Label 17	
> * Redlight		Label 18	
> * Talkback		Label 19	
<ul> <li>* VisTool MK2</li> </ul>			
> AND8	AND_SRC_ASSIGN	Label 20	
> Button 16	BT16_AUX FADER SELECT	Label 21	
> OR8	OR_ACCESS ACTIVE	Label 22	
> OR8	OR_Page_ACCESS		
> OR8	OR_Page_FADER	Label 23	
> OR8	OR_Page_IN_PATCH	Label 24	
> OR8	OR_Page_METER	Label 25	
> TFF	TFF_ACCESS ACTIVE		
> TFF	TFF_SHOW CLOCK LARGE	Label 26	
VispageSwitch	VPS_MAIN SCREEN	Label 27	
> Matrix 128*128 Control Modu	le 2 (Adr. 2)	Label 28	
Matrix 128*128 Control Modu	ile 3 (Adr. 3)		
> Matrix 128*128 Control Modu		Label 29	
Matrix 128*128 Control Modu		Label 30	
> Parm Control Module 15 (Adr		Label 31	
> Screen Src Assign Module 14	(Adr. E)		
> MF Key		Label 32	



# 3.12.38 Screen Matrix TB

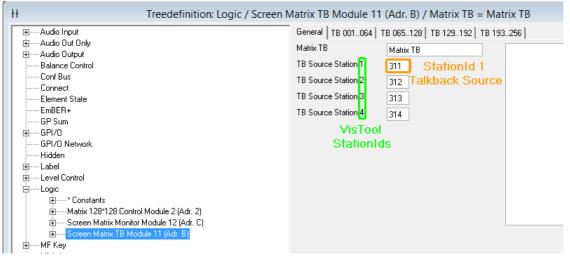


Using a VisTool Talkback Matrix, up to 256 keys can be defined, each feeding up to two mono or stereo destinations. Each key has a default audio source which can be interrupted momentarily by mono talkback (from any VisTool station 1 to 4).

## **ON-Air Designer Configuration**

- 1. Add a Screen Matrix TB module to slot 11 of the Frame -> Screen configuration.
- 2. Double-click on the module and name the panel from its General tab.

**3.** Enter the <u>matrix address</u> of the talkback source for your VisTool stations. Up to four talkback sources can be assigned, corresponding to VisTool **Station ID** 1 to 4:



4. Using the remaining tabs (**TB 001..064**, etc.) enter the <u>matrix address</u> of each default **Source** (mono) and its **Destinations**.

If the **Stereo** box is checked, then both **Destinations** are stereo; enter the address of the left destination, the right destination is always + 1.

H Treedefinition: Logic / Screen N	Aatrix TB	Module	11 (A	.dr. B) / Matrix TB = Ma	itrix TB			
Audio Input	General	TB 001064	TB	065128   TB 129192   TB 19	3256			
Em Audio Out Only     Em Audio Output	TB 001:	Source	129	Destination 1	Destination 2	17 Stereo	-	^
Balance Control Button 2	TB 002:	Source	131	Destination 1 3	Destination 2	19 Stereo	✓	
Conf Bus	TB 003:	Source	133	Destination 1 5	Destination 2	21 Stereo	✓	
Connect Element State	TB 004:	Source	135	Destination 1 7	Destination 2	23 Stereo	✓	
Energie State	TB 005:	Source	137	Destination 1 9	Destination 2	25 Stereo	✓	
GP Sum	TB 006:	Source	139	Destination 1 11	Destination 2	27 Stereo	✓	
GPI/0 Button 7	TB 007:	Source	141	Destination 1 13	Destination 2	29 Stereo	•	
Hidden	TB 008:	Source	143	Destination 1 15	Destination 2	31 Stereo	✓	
E Label	TB 009:	Source		Destination 1	Destination 2	Stereo		
Evel Control	TB 010:	Source		Destination 1	Destination 2	Stereo		
□ Logic ⊡* Constants	TB 011:	Source		Destination 1	Destination 2	Stereo		
	TB 012:	Source		Destination 1	Destination 2	Stereo		
Green Matrix Monitor Module 12 (Adr. C)     Screen Matrix TB Module 11 (Adr. B)	TB 013:	Source		Destination 1	Destination 2	Stereo		
	TB 014:	Source		Destination 1	Destination 2	Stereo		
- Martin	TB 015	Source		Destination 1	Destination 2	Stereo		

You can define up to 256 talkback keys, each with a default mono source and two stereo destinations.

The matrix addresses can refer to either an internal or external address. To address an external matrix, the **TCP** Link under "System -> Definition -> Param = TCPLink" must be set for KPF, GKPF or DKPF.



# **VisTool Editor Configuration**

1. Add some Box elements to a page.

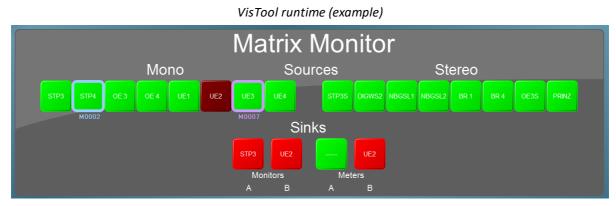
2. Right-click on the element, and open up the **MF Key** -> **Screen Matrix TB** branch. Select the talkback key you wish to assign to the VisTool button:

ð								
	TB 001: Source 129						l	
2	✓ movable						ŕ	
	✓ selectable							
	Opacity							
	System	•						
	✓ Mf Key		Remove Mf Key assignmer	a.t				
			Central Module	•				
			Key Extension Module	•				
			Matrix 128*128 Control					
			Matrix Control				ſ	
			Network Assign Parm Control					
			Screen Button RGB					
			Screen Matrix Monitor	•				
			Screen Matrix TB	•	Module 11 (Adr. B)	TB 001:	Source 129 🔻	Ī
			Screen Src Assign	•				
			Display SnapShotName			TB 001: TB 002:	Source 129 Source 130	4
								1

3. Remember to save the project, and switch to Test mode to test the talkback switching. When creating the VisTool session, the **Station ID** must be set to **1** to **4**.



# 3.12.39 Screen Matrix Monitor



Using a VisTool Monitor Matrix, mono or stereo sources can be switched to stereo sinks (destinations).

## **ON-Air Designer Configuration**

- 1. Add a Screen Matrix Monitor module to slot 12 of the <u>Frame -> Screen</u> configuration.
- 2. Double-click on the module and name the panel from its **General** tab:

 General
 Sources Mono
 Sources Stereo 1
 Sources Stereo 2
 Sinks Stereo

 Matrix Monitor
 Matrix Monitor

**3.** Using the remaining tabs (**Sources Mono**, **Sources Stereo 1**, etc.) enter the <u>matrix address</u> of each **Source** and **Sink**.

tt Treedefinition	: Logic / Scr	een Ma	trix Mo	onitor	Modu	le 12 (	Adr. C	C) / Ma	trix M	onitor	= Matr	ix Mo	nitor					8
EP-Audio Input     General Sources Mono     Sources Stereo 1 Sources Stereo 2 Sinks Stereo																		
EAudio Out Only     EAudio Output	M0001	129	130	141	142	159	160	161	162									^
Balance Control	M0021	B	ttor	2			F	uttor	7									
Conf Bus	M0041																	
Connect	M0061																	
Element State																		
GP Sum	M0081																	
	M0101																	
GPI/0 Network	M0121																	
Hidden	M0141																	
Level Control	M0161																	
ELogic	M0181																	
Constants																		
Matrix 128*128 Control Module 2 (Adr. 2)     Screen Matrix Monitor Module 12 (Adr. C)	M0201																	
Screen Matrix Monitor Module 12 (Adr. C) Screen Matrix TB Module 11 (Adr. B)	M0221																	
	M0241																	

The matrix addresses can refer to either an internal or external address. To address an external matrix, the **TCP** Link under "System -> Definition -> Param = TCPLink" must be set for KPF, GKPF or DKPF.



# VisTool Editor Configuration

1. Add some Box elements to a page.

2. Right-click on the element, open the **MF Key** -> **Screen Matrix Monitor** branch, and select the source or sink you wish to assign to the VisTool button:

↔ • • • • • • • • • • • • • • • • • • •	
✓ movable selectable	
Opacity	
System  Loudness	
✓ Mf Key ► Remove Mf Key assignment	
Central Module	
Key Extension Module	
Matrix 128*128 Control	
Matrix Control	
Network Assign	
Parm Control	
Screen Button RGB	
Screen Matrix Monitor Module 12 (Ad	Ir. C) M0001 129 -
Screen Src Assign	
Display SnapShotName	M0001 129 M0002 130
	M0002 130 M0003 141
	M0004 142

3. Remember to save the project and switch to Test mode to test the monitor matrix. When creating the VisTool session, the **Station ID** must be set to **1** to **4**.



# 3.12.40 Matrix Control 128 \* 128

## "Logic -> Matrix Control 128\*128"

This element provides an XY matrix with 128 x 128 crosspoints which can be operated from VisTool MF Keys. To use this feature you will need to add a **Matrix Control 128\*128** module to the <u>Screen</u> configuration. Then define the module's parameters as follows.

## **Global Parameters**

C	A Treedefinition: / Le	ogic / Matrix	×			
	Name	Global	Src Page	1 Src Page 2	Src Pag	e 3 Src Page 4
>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Audio Input Audio Out Only Audio Output Conf Bus Connect EmBER+ EmBER+ A-stage GP Sum GPI/O GPI/O GPI/O Network Label Level Control Logic > * Desk > Matrix Control Module 5 (Adr. 5) > Matrix 128*128 Control Module 6 (Adr MF Key Minimix N-1 Source Sum Bus Surface System	Matrix External P EmBER+ N Feedback Src alway: Take Reset Sele Select Res	latrix No. Mode s green	Matrix 1		

Matrix	Reference name for the element.							
External	Select this checkbox if the matrix to be controlled is external (i.e. not within the system frame).							
External Protocol Type	<ul> <li>If External is ticked, select the communication protocol type:</li> <li>CAN over TCP/IP - for sapphire, crystal, Nova29 or Power Core.</li> <li>MNOPL - for mc<sup>2</sup>/Nova73.</li> <li>EmBER+ - for supporting EmBER+ devices.</li> </ul>							
Ember+ Matrix Nr	When using <b>Ember+</b> , you must enter an Ember+ Matrix number (from <b>1</b> to <b>5</b> ). This references the <u>Ember+ Matrix</u> element (which defines the local consumer number, external matrix type, matrix name, etc.)							
Feedback Mode When selected, the operator only needs to select the destination and action Take. A connection is made automatically from the corresponding source. For example, Src I Matrix Nr 01 to Dest Page 1 Matrix Nr 01.								
Src always green	When this option is off, the source MF Key on VisTool changes color to indicate the connection status: red = connected; green = disconnected. Turn the option on to override the color-coding so that the source MF Key always lights in green.							
Take	Use this field to assign the 'TAKE' control signal. This makes the connection once a source and destination are prepared.							
Reset Selection	This control signal cancels any pre-selections made.							
Select Reset Time	This is the amount of time for which selected sources remain in pre-selection before they are canceled. The time resets after each selection. For example, if the <b>Select Reset Time</b> is set to 5 seconds, the operator has 5 seconds in which to select the next source before the first selection is canceled. They then have another 5 seconds to select the next source, and so on.							



## **Src and Dest Parameters**

0	A Treedefinition: / L	ogic / Matrix	(128*1)	28 Contr	rol Module 6 (Adr.	. 6)	×
	Name	Global	Src F	age 1	Src Page 2	Src Page 3	Src Page 4
>	Audio Input	Matrix No.	01	129	Type: Stereo		Active 🔽
>	Audio Out Only	Matrix No.	02	131	Type: Stereo	<b>V</b>	Active 🔽
>	Audio Output						
	Conf Bus	Matrix No.	03	133	Type: Stereo		Active 🗹
	Connect EmBER+	Matrix No.	04	135	Type: Stereo		Active 🔽
	EmBER+ A-stage	Matrix No.	05	137	Type: Stereo		Active 🔽
	GP Sum	Matrix No.	06	139	Type: Stereo	<b>Y</b>	Active 🔽
>	GPI/O	Matrix No.	07	141	Type: Stereo		Active 🔽
>	GPI/O Network Label	Matrix No.	08	143	Type: Stereo	<b>Y</b>	Active 🔽
5	Label Level Control	Matrix No.	09	0	Type: Stereo		Active
×	Logic	Matrix No.	10	0	Type: Stereo		Active
	> * Desk	Matrix No.		0	Type: Stereo		Active
	Matrix Control Module 5 (Adr. 5)						-
	Matrix 128*128 Control Module 6 (Adr	Matrix No.	12	0	Type: Stereo		Active
>	MF Key	Matrix No.	13	0	Type: Stereo		Active 🗌
	Minimix N-1	Matrix No.	14	0	Type: Stereo		Active
	Source	Matrix No.	15	0	Type: Stereo		Active
>	Sum Bus	Matrix No.	16	0	Type: Stereo		Active
>	Surface			<u> </u>	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		,,
>	System						

Matrix No xx	Enter the address of the matrix input or output (see <u>Matrix Numbers</u> ; $0 =$ silence).						
Type: Stereo	Select this checkbox if the source or destination is stereo.						
Active	Select this checkbox to see the source or destination labels on the VisTool MF Key.						



# 3.12.41 Matrix Control

## "Logic -> Matrix Control"

This element is similar to the Matrix 128 \* 128 but supports 90 x 30 crosspoints and adds protection for specific or connected crosspoints.

Most of the parameters are identical to the Matrix Control 128\*128, with the following exceptions:

## **Global Parameters**

0	A Treedefinition:	/ Logic / M	latrix Contro	l Modu	le 5 (Adr. 5)			×
	Name	Global	Src Page	1	Src Page 2	Src Pag	e 3	Src Page 4
>	Audio Input	Matrix		Matri	< 2		]	
>	Audio Out Only	External		_			]	
>	Audio Output							
	Conf Bus	External Pr	otocol Type	CAN o	over TCP/IP 🔻			
	Connect	EmBER+ M	latrix No.	none	-	•		
	EmBER+	Auto Prote	ct					
	EmBER+ A-stage	Feedback I						
	GP Sum			<u> </u>				
>	GPI/O	Src always	green				_	
	GPI/O Network	Take						
>	Label	Select Res	ot Time	5				
>	Level Control			_				
$\sim$	Logic	Protect Dst	t01					
	> * Desk	Protect Dst	t02					
	Matrix Control Module 5 (Adr. 5)	Protect Dst	103					
	Matrix 128*128 Control Module 6 (Adr							
>	MF Key	Protect Dst	t04					
	Minimix	Protect Dst	t05					
	N-1	Protect Dst	06					
	Source							
>	Sum Bus	Protect Dst	t07					
>	Surface	Protect Dst	t08					
>	System	Protect Dst	t09					

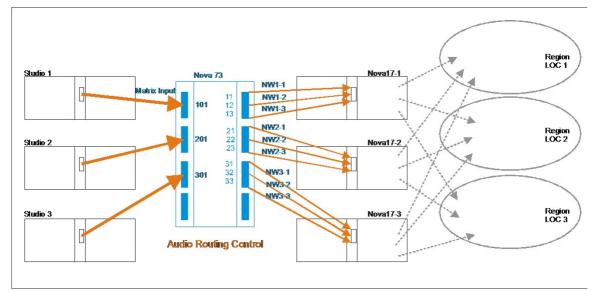
	When selected, any destinations which are connected are automatically protected so that they cannot be changed by another system.
Protect Dst01 to Dst30	Use these fields to protect specific crosspoints so that they cannot be changed by another system.



# 3.12.42 Network Assign

## "Logic -> Network Assign"

The **Network Assign** system is designed to manage the assignment of matrix signals to different Network transmission feeds within a networked installation. In the example below, three studios can be assigned to up to three Local Lines within three Networks:



The system can support up to 13 studios divided into 12 Networks and 9 Local lines. The assignments are then controlled from VisTool screen buttons.

To use this feature you will need to add a **Network Assign Module** to slot 13 of the <u>Screen</u> configuration on each of the networked systems. Then define the module's parameters as follows.

### **General Parameters**

Network Assign	Enter a reference name for the Matrix Module.
----------------	---



# Kpf Parameters

Global K	pf	Network	Local	
xternal				
NOPL	_			
latrix Input	_			
W 1-1				
W 1-2	-			
W 2-1	-			
W 2-2	-			
W 2-3				
W 3-1				
W 3-2				
W 3-3				
W 4-1	13			
W 4-2				
W 4-3				
W 5-1				
W 5-2				
W 5-3				
W 6-1				
W 6-2				
W 6-3				
V 7-1	_			

External	Select this checkbox if the matrix input address is external (i.e. not within the System Core.)
MNOPL	Select this checkbox if the module is to be controlled via the MNOPL protocol.
Matrix Input	This is the matrix input number within the Nova73 where the studio is connected. See Matrix Numbers.
NW 1-1, 1-2, 1-3, etc.	These addresses set the matrix output numbers for the connection to each Nova17.

# **Network & Local Parameters**

Global	Kpf	Network	Local		
NW Timeout					
NW-1 - Text					
NW-2 - Text					
NW-3 - Text					
NW-4 - Text					
NW-5 - Text					
NW-6 - Text					
NW-7 - Text					
NW-8 - Text					
NW-9 - Text					
NW-10 - Text					
NW-11 - Text					
NW-12 - Text					

Global	Kpf	Network	Local		
Timeout					
1 - Text					
-2 - Text					
-3 - Text					
-4 - Text					
-5 - Text					
-6 - Text					
-7 - Text					
-8 - Text					
-9 - Text					

NW Timeout	Enter the time (in seconds) after which the preselected network will be cancelled.
NW-1 Text, NW-2 Text, etc.	Enter the text which will appear on the VisTool Network selection buttons during operation.
L Timeout	Enter the time (in seconds) after which the preselected local line will be cancelled.
L-1 Text, L-2 Text, etc.	Enter the text which will appear on the VisTool Local Line selection buttons during operation.



# 3.12.43 Screen Src Assign

The buttons on a **Screen Source Assign** module can be used to perform fader strip assignments from a VisTool runtime GUI.

The assignment always works on the fader in access, and so you may wish to add some ACCESS keys to the VisTool page (as described later). The configuration requires two stages: first use the ON-AIR Designer to prepare the system configuration, and then use VisTool Editor to edit the VisTool project.

## **ON-Air Designer Configuration**

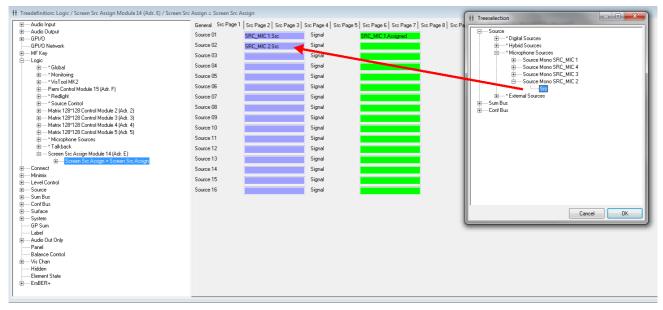
- 1. Add a Screen Src Control panel to slot 14 of the <u>Screen</u> configuration.
- 2. Name the panel from its **General** parameters tab:

H	Parameter: Screen Src Assign Module 14 (Adr. E)												
	General	Src Page 1	Src Page 2	Src Page 3	Src Page 4	Src Page 5	Src Page 6	Src Page 7	Src Page 8	Src Page 9	Src Page 10	Src Page 11	Src Page 12
	Screen Src Assign Screen Src Assign												
	Swap Colors 🔽												
SOURCE ASSIGN													

If the **Swap Colors** option is enabled, then the on-screen "Assign Src" button in VisTool will use more colors to indicate the fader strip assign status. These are described <u>later</u>.

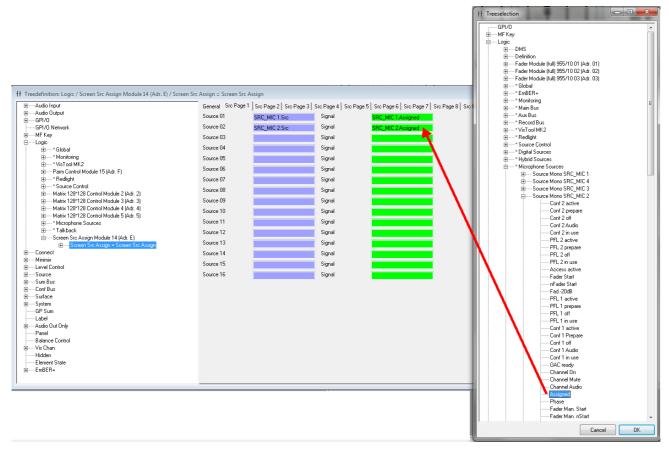
3. Select the Screen Src Control module from the "Logic" branch of the 'Tree Definition' and assign the sources you wish to make available for VisTool assignment from the Src Page parameter tabs.

You can define up to 192 sources.





Then assign the signal which will be used for the signalisation of the VisTool element - the "Source.Assigned" output is normally used:





## **VisTool Editor Configuration**

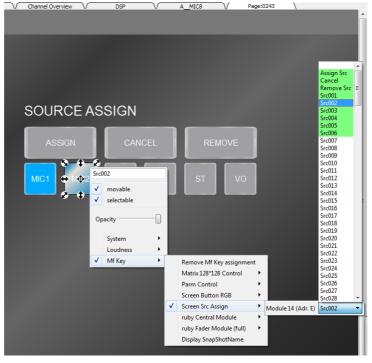
1. Add some Box elements to a page.

2. Right-click on a button, and open up the **MF Key** -> **Screen Src Assign** branch. Note that any functions which have already been used are highlighted in green.

First, add the three buttons which will action the "fader assign" mode:

- Assign Src mimics a double-press of the console's ACCESS key. This puts the current fader in access into "fader assign" mode. Once active, you can choose a source using a source select button (see below), press Cancel to cancel the operation, or press Remove Src to remove the current source.
- Cancel cancels an active Assign Src operation.
- Remove Src removes the source from the fader in access and leaves it unassigned.

Then, add the source select buttons (Src001, Src002, etc.). Each of these relates to the Screen sources defined earlier by the ON-AIR Designer - in our example, Src002 corresponds to our MIC\_2 source:



As you assign each button, it updates to show the assigned function. Edit the **User Text** property to define the name displayed on the VisTool screen.

3. Remember to save the project and switch to Test mode to test the fader strip assignments.

If the **Swap Colors** option is enabled in the ON-AIR Designer, then the on-screen "Assign Src" button shows four states:

- Red (P4) = fader result start (i.e. fader open).
- Yellow (P3) = configured signal active.
- Green (P2) = source assigned to fader.
- Black (P1) = true.

If the Swap Colors option is disabled, then only the last two states are shown:

- Green (P2) = source assigned to fader.
- Black (P1) = true.



## 3.12.44 PARM Control Module

The buttons on a **PARM Control** module can be used to adjust signal processing parameters from a VisTool runtime GUI.

The controls always work on the fader in access, and so you may wish to add some ACCESS keys to the VisTool page (as described later). PARM MF Keys are usually combined with Access Source Information to provide feedback on the source and its parameter values. The configuration requires two stages: first use the ON-AIR Designer to prepare the system configuration, and then use VisTool Editor to edit the VisTool project.

#### **ON-Air Designer Configuration**

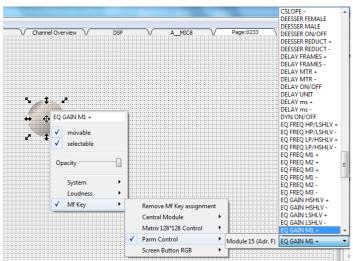
- 1. Add a **PARM Control** panel to slot 15 of the <u>Screen</u> configuration.
- 2. Name the panel from its **General** tab:

	A Parameter: Parm Control Module 15 (Adr. F)
	General
	ParmControl ParmControl
PARI	
CONTR	

### **VisTool Editor Configuration**

1. Add some Box elements to a page.

2. Right-click on a button, and open up the **MF Key** -> **Parm Control** branch. Select the parameter you wish to assign to the VisTool button - there are many options including Aux on/off and +/- for most DSP parameters:



As you assign each button, it updates to show the name of the function.

The **Access 01** to **Access 40** options are for backwards compatibility only. To assign the Access key for a fader strip to a VisTool button use the method described below.

3. Remember to save the project and switch to Test mode to test your parameter control.



# 3.13 MF Key

The "MF Key" branch of the 'Tree Definition' provides access to MF Key parameters for the:

- Central and Monitor Modules (including Extensions)
- Key Panels
- Screen Button Modules

The same parameters can be accessed by double-clicking on the module in the <u>Frame -> Surface</u> or <u>Frame -></u> <u>Panels</u> configuration.

MF Keys on Fader Modules do not appear here as they are defined in the <u>Source</u> configuration.



#### **Keys Parameters**

The MF Key parameters for a Screen Button RGB Module are shown below. Other MF Keys are programmed in a similar manner. In each case, you must name the MF Key, then program its functionality, and then define how the key will light.

Tr	eedefinition: /MFK	ey / Screen Button RGB Mod	ule 4 (Adr. 4)		×		
Name Value	Keys 18 Ke	eys 916 Keys 1724	Keys 2532	Keys 3340 Keys 4	148 Keys 4956	Keys 5764 General	
Audio Input	MF 1	AH FFH SL F		1			
Audio Out Only				1	-		
Audio Output	Default Label Line	1 FFH			Label ID		
Balance Control	Default Label Line	2 SI-F		]			
Conf Bus						-	
Connect	P1 Color	black	•	Low 🗖	Blink 🗌		Logic True.Out
Element State	P2 Color	yellow	•	Low	Blink 🗌	-	Logic
EmBER +			=				
GP Sum	P3 Color	ed red	•	Low 🗖	Blink 🗌		Logic AH Main.Out 5
GPI/O GPI/O Network	P4 Color	black	•	Low 🗔	Blink 🗌	-	Logic
Hidden	11000	- Mach		2011 /	Dan IX I		Logic
Label				,			
Label Level Control	MF 2	AH FFH SL KS					
Logic	Default Label Line	1 FEH		]	Label ID		
MFKev				1			
Central Module 16 (Adr. 0x10)	Default Label Line	-	_	]			
Function Pool	P1 Color	black	-	Low 🗔	Blink 🗌		Logic True.Out
Screen Button RGB Module 1 (Adr. 1)	00.01		_	Low 🗖	Blink 🗌	-	
Screen Button RGB Module 2 (Adr. 2)	P2 Color	yellow		LOW	BIINK		Logic
Screen Batton ROD Module 2 (Adr. 3)	P3 Color	red	-	Low 🗔	Blink	1	Logic AH Main.Out 6
Screen Button RGB Module 4 (Adr. 4)	P4 Color	black	_	Low 🗖	Blink 🗌	-	Logic
P Toby Key Extension 24 17 (Adv. 0x11)	P4 Color	DIdCK	•	LOW	DIFIK		Lögic
Minimix				-			
Panel Ravenna Input	MF 3	AH FFH SL FD					
Ravenna Input Source	Default Label Line	1 FEH		1	Label ID		
Sum Bus				1			
Surface	Default Label Line	2 SL-FD					
System	P1 Color	black	-	Low 🗔	Blink	1	Logic True.Out
Vis Chan	P2 Color	yellow	•	Low 🗔	Blink 🗌		Logic
	P3 Color	red	•	Low 🗖	Blink	1	Logic AH Main.Out 7
	P4 Color	black	-	Low 🗖	Blink [	-	Logic

MF 1	Reference name for the MF Key.					
Default Label Line 1	This is a static label for the MF Key (Line 1). Use 6 characters or less.					
Default Label Line 2	This is a static label for the MF Key (Line 2). Use 6 characters or less.					
Label ID       This field enables dynamic labeling of the MF Key. You can link this field to:         • The output of a Text Prio logic element - to switch between 16 pre-prepared text stext strings are defined by the Text Prio.         • An output from the Label logic element - this allows the zirkonlabel program to edite         • The Kpf label of any source or sum - this is the Display Name of the source or sum						
P1 Color	Selects the color for the priority 1 lamp state - lowest priority.					
P1 Low	The lamp will be dimmed.					
P1 Color	Selects the color for the priority 1 lamp state - lowest priority.					
P1 Blink	The lamp will blink.					
P1 Logic	This input triggers the P1 lamp state – lowest priority.					

The **Color**, **Low**, **Blink** and **Logic** options are repeated for the different MF Key states labeled P1 to P4 - P1 is lowest priority; P4 is highest priority. If more than one control signal is provided, then the lamps illuminate in priority – for example, P4 will win over P1. You can use the **Blink** options in combination with any of the colors. All options are repeated for each MF Key.

Once MF Keys have been named, their control outputs can be assigned to other functions via the 'Tree Selection' window. The control outputs are:

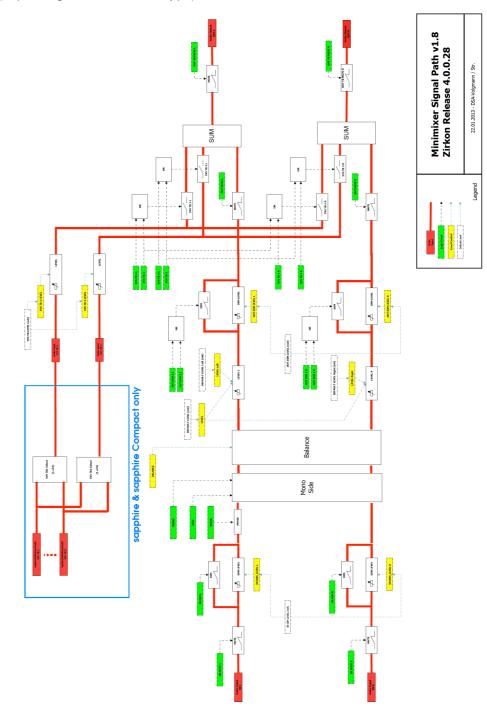
MF Key	Active when the key is pressed.
MF nKey	Active when the key is not pressed.



# 3.14 Minimix

A Minimixer is a 2-in-2-out mixer with controls for level, dim, mute, balance, and talkback insertion. It is aimed principally at monitoring, but can be used anywhere where you wish to assign level control or other functions to the signal flow.

The signal flow is shown below. Note that the left and right channels are treated independently, and the talkback inputs differ (depending on the Minimixer type).





## 3.14.1 Minimixer Types

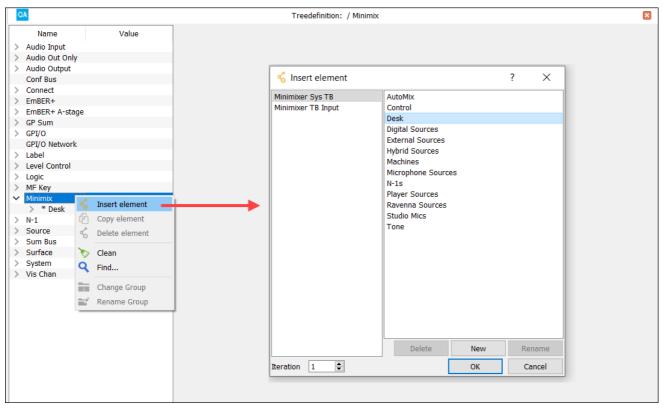
On **Power Core**, two types of Minimixer are available: "Minimixer Sys TB" (included) and "Minimixer TB Input" (available via the Minimixer add-on license). On other products, you will find one option "Minimixer Sys TB", except for the **Nova29** which supports the "Minimixer TB Input" as standard.

The two types are identical except for the talkback insertion:

- Minimixer Sys TB up to two talkback inputs can be selected from eight system-wide talkback sources.
- Minimixer TB Input the talkback source can be freely selected from any audio input.

## 3.14.2 Creating a Minimixer

Each Minimixer should be inserted under the "Minimix" branch of the 'Tree Definition'.



On Power Core, the "Minimixer TB Input" option appears once the Minimixer add-on license is enabled.

If the add-on license is not enabled, then you will see only the "Minimixer Sys TB" type.

### 3.14.3 Audio Parameters

The audio parameters (in the Global, Dim and Mute tabs) are identical for all Minimixer types.



### **Global Parameters**

OA Treedefinition: / Minimix / * Monitoring Speaker / Minimixer Sys TB = MM_MONITOR SPK								
Name Value	Global Dim Mute Sys TB							
> Audio Input	Minimixer Sys TB MM_MONITOR SPK							
> Audio Output								
> Conf Bus	In L LP_MON SPK PRE VOL.L.Out							
> Connect	In R LP_MON SPK PRE VOL.R.Ou							
EmBER+								
GP Sum	Mono ML_MOD SPK/HP MONO.Our							
> GPI/O								
GPI/O Network	Phase							
> Level Control	Side							
> Logic								
> MF Key	Level LVL_SPEAKER.Level							
V Minimix								
* Monitoring HP	Default Level (init) -128							
* Monitoring HP Guest								
<ul> <li>* Monitoring Speaker</li> </ul>	Level Left							
Minimixer Sys TB MM_MONITOR SPK	Default Level Left (init)							
> * Talkback								
> Source								
> Sum Bus	Level Right							
> Surface	Default Level Right (init) 0							
> System								
> Vis Chan								
	Balance Pot							

Minimixer	Reference name for the element.
In L	Assigns the audio sources for the left and right inputs to the Minimixer.
In R	
Mono	Assigns an input control signal to mono the left and right channels of the Minimixer; the two channels are mixed and an attenuation of 3dB applied.
	If you wish to use the Minimixer as a 2-into-1 mono mixer, assign a Logical function whose result is always true (e.g. a <u>NOT</u> logic element with no input) to force the Minimixer into Mono mode.
Phase	Assigns an input control signal to phase reverse the right channel of the Minimixer.
Side	Assigns an input control signal to route the right input to the left output and vice versa.
Level	Assigns a level control to adjust the main level of the Minimixer. The <b>Default Level</b> is applied when nothing is assigned to the <b>Level</b> function.
Level Left Level Right	Assigns a level control to exclusively adjust the main left and right channels of the Minimixer; the overall <b>Level</b> is then superimposed. This function permits level balancing. The <b>Default Level</b> (s) are applied when nothing is assigned to <b>Level Left</b> or <b>Level Right</b> .
Balance Pot	Assigns a level control to adjust the left/right balance of the Minimixer.



### **Dim Parameters**

OA	OA Treedefinition: / Minimix / * Monitoring Speaker / Minimixer Sys TB = MM_MONITOR SPK							
Name	Value	Global	Dim	Mute	Sys TB			
> Audio Input		In Dim L		OR MON	SPK DIM.Out			
> Audio Output								
> Conf Bus		In Dim R		OR_MON	I SPK DIM.Out			
> Connect						_		
EmBER+		Out Dim 1	L					
GP Sum		Out Dim 1	R					
> GPI/O								
GPI/O Network		Out Dim 2	L					
> Level Control		Out Dim 2	R					
> Logic						_		
> MF Key		In Dim Lev	ا ام					
✓ Minimix								
> * Monitoring HP		In Dim Lev	el R					
> * Monitoring HP Guest						_		
<ul> <li>* Monitoring Speaker</li> </ul>		Out Dim Le	evel L					
	MM_MONITOR SPK	Out Dim Le	aval P			<b>-</b>		
> * Talkback		Out Dim Le	ever ix					
> Source								
> Sum Bus		In Dim Lev	el (init)	-20				
> Surface		Out Dim Le	evel (init)	-20				
> System			()					
> Vis Chan								

In Dim L/R	Assigns input control signals to dim the left and right input channels to the minimixer (before the main level). The amount of dim can be assigned to a level control - see <b>In Dim Level L/R</b> - or set to a fixed level - see <b>In Dim Level (init)</b> .
Out Dim 1 L/R Out Dim 2 L/R	Assigns input control signals to dim the left and right output channels of the Minimixer (after the main level, before TB insertion). Two different control signals ( <b>Out Dim 1</b> and <b>Out Dim 2</b> ) can be applied to each channel; the control signals are OR'd - output dim will be applied if either control input is true. The amount of dim can be assigned to a level control - see <b>Out Dim Level L/R</b> - or set to a fixed level - see <b>Out Dim Level (init)</b> .
In Dim Level L/R	Assigns level controls to adjust the input Dim level for left/right channels. If blank, then the <b>In Dim Level</b> will be applied.
Out Dim Level L/R	Assigns level controls to adjust the output Dim level for left/right channels. If blank, then the <b>Out Dim Level</b> will be applied.
In Dim Level (init)	This is the level applied to the left and right input channels of the minimixer when the <b>In Dim L</b> and <b>In Dim R</b> control signals are active. Level is set in dB.
Out Dim Level (init)	This is the level applied to the left and right output channels of the minimixer when the <b>Out Dim</b> <b>1</b> L or <b>Out Dim 2</b> L, and <b>Out Dim 1</b> R or <b>Out Dim 2</b> R control signals are active. Level is set in dB.



#### **Mute Parameters**

0	A T	reedefinition: / Minimix / * Monitoring Speaker / Minimixer Sys TB = MM_MONITOR SPK	×
	Name Value	Global Dim Mute Sys TB	
>	Audio Input	In Mute L OR_MON SPK MUTE.Out	
>	Audio Output		
>	Conf Bus	In Mute R OR_MON SPK MUTE.Out	
>	Connect		
	EmBER+	Out Mute L	
	GP Sum	Out Mute R	
>	GPI/O		
	GPI/O Network		
>	Level Control	Out TB Mute L	
>	Logic	Out TB Mute R	
>	MF Key		
~	Minimix		
	* Monitoring HP		
	* Monitoring HP Guest		
	<ul> <li>* Monitoring Speaker</li> </ul>		
	Minimixer Sys TB MM_MONITOR SP	K	
	> * Talkback		

In Mute L/R	Assigns input control signal to mute the left and right input channels of the Minimixer.
	Assigns input control signals to mute the left and right output channels of the Minimixer (after main level, before TB insertion).
Out TB Mute L/R	Assigns input control signals to mute the left and right output channels of the Minimixer after TB (talkback) insertion.



## 3.14.4 Talkback (for Minimixer Sys TB)

For a "Minimixer Sys TB" element, two talkback sources can be inserted into each Minimixer chain: Sys TB 1 and Sys TB 2.

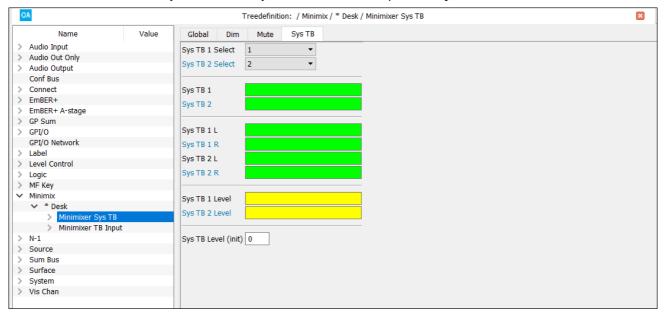
On crystal, these are dedicated sources.

On sapphire, sapphire compact and Power Core, they can be selected from the eight system-wide talkback sources (defined in the "System -> Definition -> Audio = Internal" branch of the 'Tree Definition'). This allows you to use different talkback inputs for each Minimixer.

In each case, there are two parts to the configuration: first, define the system-wide talkback source(s) and, second, define the talkback parameters for each individual Minimixer.

### Minimixer - Sys TB Parameters

Now select the "Minimixer Sys TB" element you wish to edit and open the Sys TB tab.



Each source can be summed with both left and right channels of the minimixer using a single control signal (Sys TB 1 and Sys TB 2). Or, each source can be summed independently with the left or right channels (e.g. Sys TB 1L and Sys TB 1 R). This second option allows talkback to be inserted on only one side of the minimixer.

Level for each talkback source can be assigned to a level control - see Sys TB 1/2 Level - or set to a fixed value - see Sys TB Level (init).

Sys TB 1 Select Sys TB 2 Select	Use these fields to set <b>Sys TB 1</b> and <b>Sys TB 2</b> to one of the eight pre-defined talkback signals (in " <u>System -&gt; Definition -&gt; Audio = Internal</u> "). These fields are not visible for crystal (as only two talkback sources are supported).
Sys TB 1 Sys TB 2	Assign an input control signal to sum each talkback source with both the left and right channels of the Minimixer.
Sys TB 1 L/R Sys TB 2 L/R	Assign an input control signal to sum each talkback source with either the left or the right channel of the Minimixer. Note that the <b>Sys TB 1</b> and <b>Sys TB 1L</b> control signals are OR'd – this means that audio source 1 will be inserted to the left channel if either control input is true.
Sys TB 1/2 Level	Assign a level control to adjust the level of the talkback source. If left blank, then the <b>SysTB</b> Level (init) is applied.
Sys TB Level (init)	This is the level applied if the <b>Sys TB 1 Level</b> or <b>Sys TB 2 Level</b> are not assigned. The level is set in dB.



## 3.14.5 Talkback (for Minimixer TB Input)

For a "Minimixer TB Input" element, the talkback source can be freely selected from any audio input. Select the "Minimixer TB" element you wish to edit, and open the **TB** tab to edit the talkback parameters.

	OA Treedefinition: / Minimix / * Desk / Minimixer TB Input = MM_MONITOR HP GUEST									
	Name	Value	Global	Dim	Mute	тв				
>	Audio Input		TB In							
>	Audio Out Only									
>	Audio Output		ТВ							
	Conf Bus		TB L							
>	Connect		TB R							
>	EmBER+		10 K							
>	EmBER+ A-stage									
>	GP Sum		TB Level							
>	GPI/O		TB Level	(init)	0					
	GPI/O Network									
>	Label									
>	Level Control									
>	Logic									
>	MF Key									
~	Minimix									
	✓ * Desk									
	> Minimixer Sys TB	MM_MONITOR SKR								
	Minimixer TB Input	MM_MONITOR HP GUEST								
>	N-1									
>	Source									
>	Sum Bus									
>	Surface									
>	System									
15	Vis Chan									

The talkback source can be summed with both left and right channels of the minimixer using a single control signal (**TB**). Or, talkback can be summed independently with the left or right channels (**TB L** and **TB R**). This second option allows talkback to be inserted on only one side of the minimixer.

The talkback source level can be assigned to a level control using **TB Level**, or set to a fixed value using **TB Level** (init).

TB In	Assign the audio input to be used as the talkback source.
ТВ	Assign an input control signal to sum the talkback source with both the left and right channels of the Minimixer.
TB L TB R	Assign input control signals to sum the talkback source with either the left or the right channel of the Minimixer.
TB Level	Assign a level control to adjust the level of the talkback source. If left blank, then the <b>TB Level</b> (init) is applied.
TB Level (init)	This is the level applied if the <b>TB Level</b> field is not assigned. The level is set in dB.



## 3.15 N-1

This option allows you to configure 64 dedicated N-1 returns to expand the mix minus capabilities of the system. It can be used once the N-1 add-on license is enabled.

If the add-on license is not enabled, then you will see the "N-1" branch in the 'Tree Definition', but cannot insert any elements.

### 3.15.1 N-1 Anatomy

Each N-1 can subtract an individual source from a summing bus.

The summing bus can be either mono or stereo, and can be any <u>Sum Bus</u> or <u>GP Sum</u>. This allows you to create N-1 returns from existing buses such as PGM. Or, define new buses specifically for the purpose.

### 3.15.2 Creating N-1s

Use the "N-1" branch of the 'Tree Definition' to insert an N-1 element in the usual manner. Then define the parameters as follows.

Note that to create an N-1 for a stereo source, the **Type** and **Sum Bus** must be stereo.

In the example below, four stereo N-1 returns have been created for the four MIC sources using the existing PGM bus.

OA			Treedefinition: $/ N-1 / * N-1s / N-1 = N$	lixMinus MIC1	×
Name	Value	General			
> Audio Input		N-1	MixMinus MIC1	Type Stereo 👻	
> Audio Out Only				.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
> Audio Output		Source	SRC_MIC 1.Src		
Conf Bus		Sum Bus Stereo	Sum_PGM.Sum Bus Stereo		
> Connect					
> EmBER+					
EmBER+ A-stage					
> GP Sum					
> GPI/O					
GPI/O Network					
> Label					
> Level Control					
> Logic					
> MF Key					
> Minimix					
✓ N-1					
✓ * N-1s					
	MixMinus MIC1				
	AixMinus MIC2				
	AixMinus MIC3				
	AixMinus MIC4				
> Source					
> Sum Bus					
> Surface					
> System					
> Vis Chan					

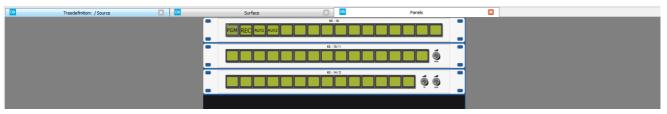
N-1	Enter a reference name for the N-1 element.
Туре	Set the type to either <b>Mono</b> or <b>Stereo</b> , depending on the format of the summing bus you wish to use.
Source	Select the source you wish to subtract. If the <b>Type</b> = Mono, then you can choose any mono source. If the <b>Type</b> = Stereo, then you can choose any mono or stereo source.
Sum Bus	Select the summing bus you wish to use. If the <b>Type</b> = Mono, then you can choose any mono bus (Sum Bus or GP Sum). If the <b>Type</b> = Stereo, then you can select any stereo bus (Sum Bus or GP Sum).





## 3.16 Panel

This branch appears in the 'Tree Definition' once one or more Key Panels have been added to the <u>Frame -></u> <u>Panels</u> configuration:



The parameters vary slightly depending on the panel type. The next few pages show some examples. In each case, the buttons are treated as MF Keys.

## 3.16.1 KSC-LCD Panels

OA		Treedefinition: / MF	Key / KSC-LCD14P2-R	GB Module 2 (Adr. 2)			×				
Name	Value	Keys 18 Page 1	Keys 914 Page 1	Keys 18 Page 2	Keys 914 Page 2	Keys 18 Page 3	Keys 914 Page 3	Keys 18 Page 4	Keys 914 Page 4	VCA	Module
Audio Input     Audio Out Only		Page 1 Key 1 Name Line 1			Lab	el ID					
> Audio Output		Name Line 2			200						
> Conf Bus > Connect			green 👻		Blink	ogic					
> EmBER+		P2 Color	yellow 👻		Blink	ogic					
EmBER+ A_Line		P3 Color	red 👻		Blink	ogic					
> GP Sum > GPI/O		P4 Color	black 👻		Blink 🗌	ogic					
> GPI/O Network											
> Label		Page 1 Key 2									
> Level Control		Name Line 1			Lab	el ID					
> Logic		Name Line 2									
<ul> <li>MF Key</li> <li>Central Module 16 (Adr. 0x10)</li> </ul>		P1 Color	green 🔻		Blink	.ogic					
> Function Pool		P2 Color	yellow 👻		Blink 📃	ogic					
> KEY20 Module 1 (Adr. 1)		P3 Color	red 👻		Blink 📃 🛛 I	ogic					
KSC-LCD14P2-RGB Module 2 (Adr. 2) Screen Button RGB Module 1 (Adr. 1)		P4 Color	black 👻		Blink 📃	ogic					

The LCD panels support dynamic labels and up to four pages of MF Keys (switchable in two layers). Use the **Keys Page** tabs to define the MF Key parameters (name, label and lamp color/state), and the **Module** tab to define the page and layer switching.

#### **Keys Parameters**

Page x Key y	Enter a reference name for the MF Key.				
Name Line 1	This is a static label for the MF Key (Line 1). Use 6 characters or less.				
Name Line 2	This is a static label for the MF Key (Line 2). Use 6 characters or less.				
Label ID	<ul> <li>This field enables dynamic labeling of the MF Key. You can link this field to:</li> <li>The output of a <u>Text Prio</u> logic element - to switch between 16 pre-prepared text strings. The text strings are defined by the <u>Text Prio</u>.</li> <li>An output from the <u>Label</u> logic element - this allows the zirkonlabel program to edit the label.</li> <li>The Kpf label of any source or sum - this is the <u>Display Name</u> of the source or sum.</li> </ul>				
P1 Color	Selects the color for the priority 1 lamp state - lowest priority.				
P1 Blink	The lamp will blink.				
P1 Logic	This input triggers the P1 lamp state – lowest priority.				

The **Color**, **Blink** and **Logic** options are repeated for the different MF Key states labeled **P1** to **P4** – **P1** is lowest priority; **P4** is highest priority. If more than one control signal is provided, then the lamps illuminate in priority – for example, **P4** will win over **P1**. You can use the **Blink** options in combination with any of the colors. All options are repeated for each MF Key.

Once MF Keys have been named, their control outputs can be assigned to other functions via the 'Tree Selection' window. The control outputs are:

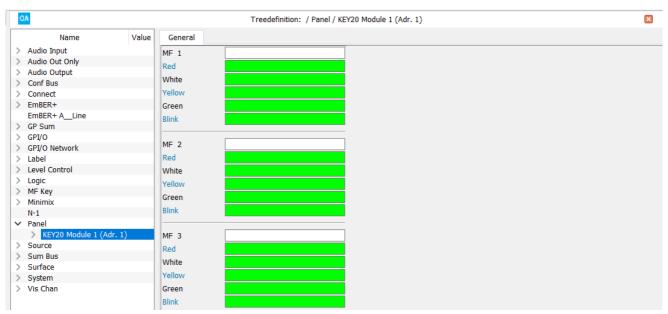
MF Key	Active when the key is pressed.
MF nKey	Active when the key is not pressed.



### **Module Parameters**

Module	Reference name for the panel. Once named, the alarm status for the panel can be assigned to another function (via the "Panel" branch of the 'Tree Selection'). The "failed" output is active when the alarm is active.
Select Page x	Reference name for the Page select function.
Select Logic	This input control signal makes Page x active. It can be any control signal but is usually an MF Key on the same key panel.
Shift	Reference name for the SHIFT select function.
Shift Select Logic	This input control signal makes the SHIFT layer active. It can be any control signal but is usually an MF Key on the same key panel.

## 3.16.2 KSC-T20 Key Panel



Some key panels have simpler MF Key lamp color/state parameters, for example:

MF 1	Reference name for the MF Key.
Red	Lights the Red lamp – highest priority.
White	Lights the White lamp.
Yellow	Lights the Yellow lamp.
Green	Lights the Green lamp – lowest priority.
Low	The lamp will be dimmed.
Blink	The lamp will blink.

### 3.16.3 GPIO & VCA Parameters

Some key panels provide GP inputs and outputs which can be configured in the same way as a GPIO card. Some key panels provide VCAs which can be configured in the same way as other <u>Level Controls</u>.



# 3.17 Source

The "Source" branch of the 'Tree Definition' allows you to insert and configure sources.

Each source can support several sets of parameters. Switch between them using the menu tabs at the top of the parameter area.

The most important fields are the source Name and Type (defined in the Parm tab):

OA .	Treedefinition: / Se	ource / * Mi	crophone	Sources	/ Source = SRC	_MIC 1			×
Name	Value	Parm	PFL	Conf	Down Src	Aux	Aux Switch	n Kevs	
> Audio Input		Source			SRC_MIC 1			Type Mono 🔻	
> Audio Out Only								Mono	
> Audio Output		Display			MIC 1			Stereo	
> Conf Bus		Alias						5.1	
✓ Connect		Class			Default		]	5.1+2	
✓ * Desk		EmBER+ I	ocal Prov	ridor No	1	-	1	VCA Group	
> TConn64					-			Minimix R3LAY	
> EmBER+		SrcRepl E	lement N	0.	none	•		Pro Tools	)
> EmBER+ A-stage		EmBER+ /	A-stage				Chann	Pro Tools	
GP Sum		List Enabl	e		<b>v</b>				
> GPI/O		Audio Inp	ut		MIC-LINE01.In	n .			
GPI/O Network					MIC-LINEOI.III	Ψ			
> Level Control		Lim Disab							
✓ Logic		Dyn Disab	le						
<ul> <li>* Ravenna Sources</li> </ul>		Eq Disable	e						
> RAVENNA Src Pool		Dly Disabl	e						
> MF Key		DeEsser /	AutoMix	Disable					
> Minimix		RAVENNA			Off	•			
N-1					OII	· ·			
✓ Source		Fader Lev	el Sync						
> * AutoMix		Fader Op	en						
> * Digital Sources		Input Mut	e						
> * External Sources		Fader Up							
> * Hybrid Sources									
<ul> <li>* Microphone Sources</li> </ul>		Fader Dov	wn						
> Source	SRC_MIC 1	Fader Tog	ggle		SRC_MIC 1.MP	F 3 Key			
> Source	SRC_MIC 2	Fader Up	to Last V	alue					
> Source	SRC_MIC 3	Fader To							
> Source	SRC_MIC 4	Fader To	ygie to La	st value					

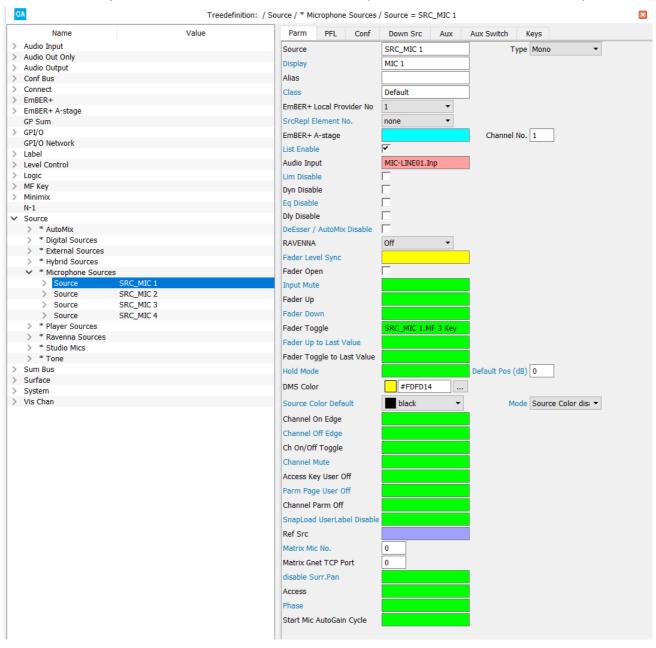
A source *must* be named before it can be referenced to other elements via the 'Tree Selection'.

For **Power Core**, the **Type** defines whether this is a normal audio source (mono, stereo or surround) or a special source such as a VCA Group, Minimix, R3LAY or Protools. For **crystal**, **sapphire compact** and **sapphire MK2**, the source type is defined when you insert the source element. This topic covers normal audio sources. The other source types are described <u>later</u>.



## 3.17.1 Source -> Parm

Select the source you wish to edit in the 'Tree Definition' and open the Parm tab to access its main parameters:



Source Name	Reference name for the source element.
Туре	This field defines the type of source.
Display	Display name for the source. This is the name which appears in the fader label display when the source is assigned to the control surface. Enter 6 characters or less so that the name can appear in full on the control surface displays. It is strongly recommended that you use unique <b>Display</b> names wherever possible!
Alias	This name can be used to distinguish between sources which have the same 'Display' name. For example, if you have two sources named CD, you will need to enter different Alias names in order to save and load snapshots. If an Alias name is not entered then snapshot data is referenced to the 'Display' name.



Class	This field applied to VisTool Snapshots. It can be used to permit <b>Src</b> snapshots saved on one source to be recalled on another.
	If the <b>Class</b> field is left empty, then <b>Src</b> snapshots stored from the source can only be recalled to itself.
	If the <b>Class</b> field is set to the same text string as other sources (e.g. <b>Default</b> ), then <b>Src</b> snapshots stored from another <b>Default</b> source may be recalled. This is useful if, for example, you wish to able to recall microphone parameters stored on one input to another.
Ember+ Local Provider Nr	This field can be used to publish all source parameters to an Ember+ provider - enter the provider number from <b>1</b> to <b>5</b> , or select <b>None</b> if you do not wish to publish the source.
	Sources can be published using either their <b>Display</b> name or <b>Alias</b> name depending on the status of the <u>Sources/Sums Naming</u> option (defined under "System -> Definition -> Params = Ember+ Settings"). In either case, the name must be unique to ensure correct operation.
Src Repl Element Nr Src Repl Name	These fields are used to couple the source to an external source in an Ember+ consumer. The <b>Src Repl Element Nr</b> should match that defined in the <u>Ember+ SrcRepl</u> element. The <b>Src Repl Name</b> should match the name (either <b>Display</b> or <b>Alias</b> ) configured in the Ember+ consumer.
EmBER+ A-stage	Available when the System Core = <b>Power Core</b> . This field can be used to assign an <u>Ember+ A-</u> <u>stage</u> element so that the source can control microphone parameters within an Astage device via Ember+. Having assigned a device (via its Ember+ A-stage Element Name), enter a <b>Channel No</b> . (from 1 to 32) to select the mic input.
List Enable	Enable this checkbox to add the source to the source selection list. This allows operators to assign the source to a fader strip from the control surface.
Enable Access Group 1 to 4	Available when the System Core = <b>Power Core Max</b> . See Configuring Power Core Max Sources.
Audio Input	Selects the audio input for the source.
Limiter Compressor Equaliser Delay DeEsser/AutoMix	Available when the System Core = <b>Compact Engine</b> . Enable the checkboxes to assign signal processing to the source. The <b>Compressor</b> represents the complete dynamics section: Gate, Expander and Compressor. The <b>DeEsser/Automix</b> shares the same DSP module and is available for mono and stereo sources only.
Lim Disable Dyn Disable Eq Disable Dly Disable DeEsser/AutoMix Disable	Available when the System Core = <b>Power Core</b> or <b>Nova17</b> . In this instance, the DSP blocks are automatically enabled for each source. Use the checkboxes to disable the signal processing. For example, if you wish to minimize the latency. The <b>Dyn</b> represents the complete dynamics section: Gate, Expander and Compressor. The <b>DeEsser/Automix</b> shares the same DSP module and is available for mono and stereo sources only.
Nova17/MTx Server	Available on stereo sources only. If the audio input to the source is assigned from a remote matrix, then this option selects the method of communication:
	• Turn the option <b>On</b> if the remote matrix is a Nova17, Nova29 or Matrix Server.
	<ul> <li>Turn the option Off if the remote matrix is a Nova73 (for communication via Remote MNOPL).</li> <li>Once communication is established, you can use the Matrix Out 1 field to support the transfer of labels from the remote matrix (to the fader label display on the console).</li> <li>And/or use the Class/Pool field (and Mtx Src Pool logic element) to provide operator-controlled</li> </ul>
	selection of audio inputs from the remote matrix. See Configuring a Matrix Source Pool.
Matrix Out 1	Available on stereo sources only. This option allows the labels from a remote matrix (as described above) to appear in the fader strip displays and source's Kpf label.
	Enter the matrix number of the remote matrix output which is connected to the source's audio input.
Class/Pool	Available on stereo sources only. This option will allow an operator to select audio inputs from a remote matrix directly from the fader strip. See <u>Configuring a Matrix Source Pool</u> . When using a Nova17, Nova29 or Matrix Server, enter the Pool ID defined in the corresponding MTx Src Pool element. When using a Nova73, enter the class configured in the Nova73 map (as described in the
	" <u>ext_router_control_en</u> " pdf).



RAVENNA RAVENNA Pool No.	Available when the System Core = <b>Power Core</b> . When set to ON, the source becomes a RAVENNA source that can <u>subscribe</u> to streams available on the network. Up to 6 pools can be defined to shape the availability of streams, and whether a particular stream can be selected by this source. A <u>RAVENNA Src Pool</u> element must be defined to support this feature. See <u>Configuring RAVENNA</u> <u>Pool Sources</u> .
Fader Level Sync	Available when the System Core = <b>Power Core</b> . This feature works in the same way as "Fader Level Sync" in a Minimix Source (described <u>later</u> ). It allows the source fader level to be controlled from another gain element (e.g. Source, VCA, GNET UDP). Similarly, the <b>Fader Level Out</b> (in the 'Tree Selection') can be used to control gain in another element (e.g. Source, Minimixer, GNET UDP). When using this feature to sync different control types, note that there may be differences in the value ranges: e.g. Faders = infinity to +9dB; VCAs = infinity to 0dB. In this instance, the effective gain value is applied.
Fader Open	Tick this box if you wish the level of the source to be set to 0dB rather than - infinity. This is particularly useful for sources which are not to be assigned to the control surface.
Input Mute	Selects an input control signal to mute the audio input. This mute occurs at the point before the signal is distributed in the matrix, therefore will affect routes to other destinations as well as to the selected source. (To mute the source within the 'channel', see <u>Channel Mute</u> .) The mute is active until the input control signal = Logical "1".
Fader Up	Opens the source fader (see also <b>Hold Mode</b> below).
Fader Down	Closes the source fader (see also <b>Hold Mode</b> below).
Fader Toggle	Changes the state of the source fader: open to closed, or vice versa (see also <b>Hold Mode</b> below).
Fader Up to Last	Opens the source fader to its last known position.
Value	Toggles the source fader to its last known state.
Fader Toggle to Last Value	These 5 functions can be used to program a fader start and are triggered by the rising edge of the input control signal.
Hold Mode	When this input is active, the last position is stored when the fader is closed by <b>Fader</b> <b>Down/Toggle</b> . Opening the fader using logic sets the fader to the last stored position. If <b>Hold Mode</b> is activated while the fader is closed, then the <b>Default Position</b> set below is used.
Default Pos (dB)	Used in conjunction with <b>Hold Mode</b> . Sets the default level, in dB, to which the fader will open if <b>Hold Mode</b> is activated while the fader is closed.
DMS Color	The value entered here selects the color for DMS meters within VisTool. The value shown is represented by 0xRRGGBB where RRGGBB denote the amounts of Red, Green and Blue respectively. Click on the color selector box to choose from the color palette.
Source Color Default	Selects the color used to illuminate the fader strip backlight when the <b>Mode</b> is set to either:
	Source Color Enabled
	• Mix Mode
	If you select Black, then the backlight is unlit.
Source Color Mode	Select the mode of operation for the fader strip backlight:
	<ul> <li>Source Color Enabled - always indicates the type of source.</li> </ul>
	<ul> <li>Source Color Disabled - always indicates signal present.</li> </ul>
	<ul> <li>Mix Mode - combines the options above; signal present takes priority.</li> </ul>
	Signal present parameters are defined under "System -> Definition -> Parameter = Signal Present".
Channel On Edge	When a positive edge is supplied to this input, the source is unmuted.
Channel Off	When a positive edge is supplied to this input, the source is muted.
Edge	This input toggles the status of the channel mute on each rising edge of the control signal.
Ch On/Off Toggle	This input mutes the source as long as it is supplied with an active control signal.
Channel Mute	These 4 control inputs allow the audio signal of a source to be switched on and off.
Access User Off	This input locks out the Access Key so that the source cannot be assigned to the center section. You may use this to limit operator access to source parameters.
Parm Page User Off	This input locks out all DSP modules for the source. You may use this to prevent parameters such as a presenter's mic EQ and Compression from being altered by the operator.



Channel Parm off	This input locks parameter control from the channel fader strip. You may use this to prevent parameters such as mic gain and pan from being altered by the operator.
Ref Src	Selects the reference source. When a source is assigned to the control surface, a reference source can be assigned at the same time. For example, on a console with two layers – on-air and record – you could assign the TEL source to both layers automatically. In this parameter box, assign the reference source (e.g. TEL). To determine where the reference source appears on the control surface, use the <b>Ref Src Fader Offset</b> option set within the " <u>System -&gt; Definition -&gt; Param = Fader</u> ". Note that changing DSP parameters on one of the sources will affect the other.
Matrix Mic Nr Matrix Gnet Port	These two fields are used if the audio input to the source is a microphone which requires arbitration. See <u>Mic Arbitration</u> . Use the <b>Matrix Mic Nr</b> field to enter the <u>Mic Input Nr</u> referenced within the server's configuration. In the <b>Matrix Gnet Port</b> field, enter the <u>GPI/O Network</u> port number which connects to the server.
disable Surr. Pan	This control input disables the Surround Pan parameters on the Channel and Central Modules – LCR, front-rear, Center slope and LFE level. This can be used to simplify operation for a stereo installation. Note that 5.1 panning is only available if 5.1 or 5.1+2 Sums are configured.
Access	This control input will action the fader access key for the source. For example, to action an access key from a GPI.
Mono	Available on stereo sources only. This control input monos the source.
ms -> xy	Available on stereo sources only. This control input converts an ms input to xy.
Stereo	Available on stereo sources only. This control input resets the source to stereo.
Left -> Both	Available on stereo sources only. This control input routes the Left audio input to both sides of the source.
Right -> Both	Available on stereo sources only. This control input routes the Right audio input to both sides of the source.
Side Swap	Available on stereo sources only. This control input reverses the Left and Right audio inputs at the input to the source.
Phase	Available on mono and stereo sources only This control input reverses the phase of the source.
Start Mic AutoGain Cycle	Available on microphone input sources only. This control input starts the AutoGain measurement process.

The following control outputs appear in the 'Tree Selection' under "Logic -> GroupName -> SourceName".

Access active	Active if the ACCESS Key on the source fader strip is active.
OAC ready	On Air Control ready. This control output may be used by an external Radio Automation System.
Channel On	Active when the 'Channel Mute' is inactive.
Channel Mute	Active when the 'Channel Mute' is active.
Channel Audio	Active when the source is "on air" - this occurs when the fader is open AND the channel is ON. (i.e. Channel Mute inactive).
Assigned	Active when a source is assigned to a fader strip.
Phase	Active when the source is phase reversed.
Mono	(stereo sources only). Active when the source is in mono.

The remaining source parameter tabs are described later. See <u>Source -> PFL</u>, <u>Conf</u>, <u>DownSrc</u>, <u>Aux</u>, <u>Keys</u> / <u>Fader Status</u>.



### Fader Status

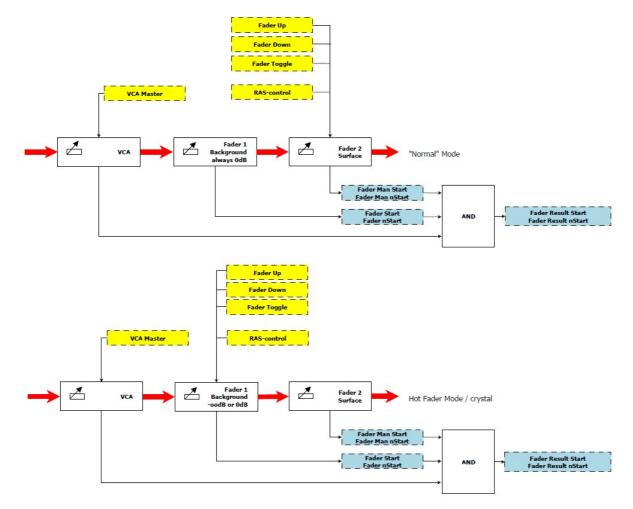
The fader status outputs are active depending on the status of the source fader.

Note that each control surface will behave differently depending on whether or not it supports moving faders. For surfaces with moving faders, there is a choice of two modes: Normal or Hot Fader (described below). For surfaces with non-moving faders, there is no choice as the faders *always* operate in the equivalent of Hot Fader Mode.

The two modes are shown in the diagram below.

- Normal Mode the surface fader position always represents the fader level. This means that if a source is controlled by RAS or Fader Up/Down/Toggle logic signals, then the surface fader will move in response to the automation.
- Hot fader Mode the surface fader position is independent of any automation (RAS or fader logic). This allows an operator to preset a fader value (e.g. 0dB), before an RAS controller or Fader Up/Down/Toggle fader start opens or closes the Background fader level.

Note that in **Normal Mode**, the Background level is always 0dB and has no action; in **Hot Fader Mode**, the operator sets the Surface level, while RAS or fader logic signals control the Background level.





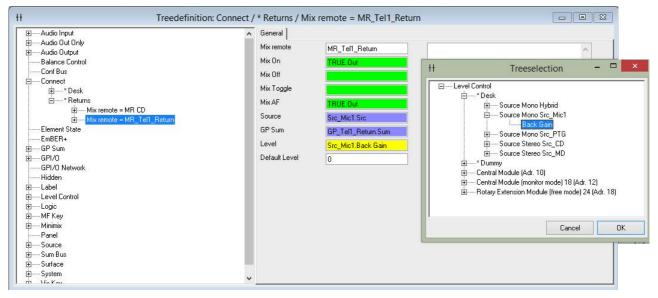
The following fader status outputs are available for each source. You can use these to trigger other logical functions via the 'Tree Selection' window.

Fader Start	For moving fader systems:
	<ul> <li>In Normal mode the output indicates the status of the RAS/Logic controlled surface fader position.</li> </ul>
	<ul> <li>In Hot Fader mode, the output indicates the status of the RAS/Logic controlled background fader position.</li> </ul>
	For non-moving fader systems, the output is active when the "Background" fader (RAS/Logic) value is open.
nFader Start	The negative result of Fader Start.
Fad20dB	Becomes active when the "Background" fader value moves above -20dB. Becomes inactive when the "Background" fader value is off.
Fader Man. Start	For moving fader systems: <ul> <li>In Normal Mode the status is true by default.</li> </ul>
	<ul> <li>In Hot Fader Mode, the output reflects the surface fader position.</li> </ul>
	For non-moving fader systems, the output reflects the status of the physical fader position. It is active when the "Surface" fader value is open.
Fader Man. nStart	The negative result of Fader Man. Start.
Fader Man.	Becomes active when the "Surface" fader value moves above -20dB.
-20dB	Becomes inactive when the "Surface" fader value is off.
Fader Result Start	Active if <b>Fader Start</b> AND <b>Fader Man. Start</b> are both active. If a VCA master is assigned, then this also needs to be active.
	In Normal mode this output is identical to Fader Start.
	In <b>Hot Fader mode</b> , this output flags the status of the combined physical fader and RAS/logic controlled fader position. In other words, both the physical fader and the automation/logic need to be open for this output to be true.
Fader Result nStart	The negative result of Fader Result Start.
Fader prepared	Active if Fader Start is active AND Fader Man Start is NOT active.
	Use this output in <b>Hot Fader mode</b> , or on non-moving fader systems, to flag when the RAS or logic has opened a fader position, but the physical surface fader is closed.
Fader Touch active	Active if the fader sense is active (the fader is touched).



### Back Gain

The **Back Gain** is a channel-related level which can be used by any element, such as a <u>Minimixer</u> or <u>Mix</u> <u>Remote</u>, to adjust the level of a return path for the source such as an Aux. It can be found under the **Level** branch of the 'Treeselection':



Once assigned, the **Back Gain** can be controlled from VisTool (via the <u>Vis Chan BackGain</u> parameter) or from another console or system (via an <u>Ember+ Internal Src Control</u> element).



## 3.17.2 Source -> PFL

For each source defined in the 'Tree Definition', open the **PFL** tab to edit the source-specific PFL parameters. These functions are triggered by the rising edge of the input control signal.

Name Value	Parm PFL Conf Down Src Aux Aux Switch Keys	🖡 Treeselection ? 🗙
Audio Input	PFL 1 On	EmBER+
Audio Out Only		GPI/O
Audio Output	PFL 1 Off	> Logic
Conf Bus	PFL 1 Toggle SRC_MIC DJ.MF 4 Key	✓ MF Key
Connect		> * AES Sources
EmBER+	PFL 2 On	> * Aux Bus
GP Sum	PFL 2 Off	> *Desk
GPI/O		> *Hybrids
GPI/O Network	PFL 2 Toggle	> *Line Sources
Label		> * Main Bus
Level Control		> * Microphones
Logic		> * Monitoring
MF Key		> * Off Air Record
Minimix		> *Tone
Panel		> Central Module (Adr. 10)
Source		> Key Extension Module (Adr. 11)
> * AES Sources > * Desk		Screen Button RGB Module 1 (Adr. 1)
> * Hybrids		▼ TB12 Module 2 (Adr. 2)
* Line Sources		> MF 1 TB 1
* Microphones		✓ MF 2 TB 2
<ul> <li>Source Mono SRC_MIC DJ</li> </ul>		Key
Source Mono SRC_MIC 02		> Panel
Source Mono SRC_MIC 02		> Surface
Source Mono SRC_MIC 04		
Source Mono TB Insert Out		
> * Monitoring		
> *Tone		
Sum Bus		
Surface		
System		
		OK Cancel

PFL On	Turns On PFL for the source.
PFL Off	Turns Off PFL for the source.
PFL Toggle	Changes the state of the source PFL.

The following control outputs appear in the 'Tree Selection' under "Logic -> GroupName -> SourceName".

PFL active	Active when the source is routed onto the PFL bus ( <b>PFL On</b> ).
PFL prepare	Active when the source is in 'PFL Prepare'. This state occurs when you turn on PFL for an open fader in either PFL R or PFL SUM R mode. Your monitoring does not change but the source is put into 'PFL prepare'. When you close the fader, PFL becomes active.
PFL off	Active when both <b>PFL active</b> and <b>PFL prepare</b> are off.
PFL in use	Active if either <b>PFL active</b> or <b>PFL prepare</b> are active.
PFL assigned	Indicates which PFL bus (1 to 5) is assigned as "PFL 1". PFL 1 may be swapped with another PFL bus (from 1 to 5) from " <u>Surface -&gt; Fader Module -&gt; PFL1</u> <u>Swap</u> ".



## 3.17.3 Source -> Conf

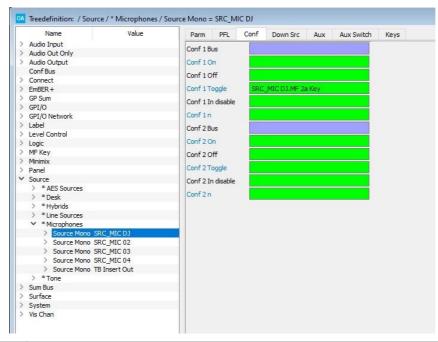
Select the **Conf** tab in the "**Source**" branch of the 'Tree Definition' to assign a conference bus to each source.

All options are repeated for the two separate conference systems – Conf 1 and Conf 2. By using the command "Conf 1 In disable" or "Conf 2 In disable", you can form different mix-minus/conference group. i.e. Sources working on Conf 1 need not be included in Conf 2 and vice versa.

When working with two conference groups, please note:

- Sources assigned to different conference groups cannot communicate while a conference is active.
- When a source is assigned to both conference groups it is required to configure the switching or summing of the Conf buses separately.
- Conf buses with the attribute "**Conf 2**" (see below) must only be set as a Conf 2 bus within the sources. The same applies to Conf 1.

The source parameters in the 'Tree Definition' are as follows. All options are repeated for Conf 1 and Conf 2.



Conf 1 Bus	Assigns a Conf Bus to the source. This sets the relationship between the source and the bus in order to generate the N-1 mix.
Conf 1 On	Turns on the Conference system with a rising edge.
Conf 1 Off	Turns off the Conference system with a rising edge.
Conf 1 Toggle	Changes the state of the Conference system with a rising edge.
Conf 1 In disable	A rising edge removes the source from all conference buses that are assigned to the Conference 1 system. A falling edge reassigns the source. For example, this might be linked to the presenter's cough switch.
Conf 1n	If a source is assigned to a Conf Bus 1, then you can use the control input Conf 1n to assign its own signal to the conference bus. With a rising edge source is added and with a falling edge it is taken away.



The following control outputs appear in the 'Tree Selection' under "Logic -> GroupName -> SourceName".

Conf active	Active when Conf is switched on for this source, but not any other source, and the fader is closed. (i.e. there is one conference source off-air). In this state, the Conference system is disabled and the source receives a sum of all faders minus themselves.
Conf prepare	Active when Conf is switched on and the fader is open. In this state, the Conference system is disabled and the source receives a sum of all faders minus themselves.
Conf off	Active when Conf is switched off. The fader state is irrelevant. In this state, the source does not contribute to the Conference system.
Conf Audio	Active when Conf is switched on and the fader is closed for this and at least one other source. (i.e. there is at least one conference source off-air). In this state, the Conference system is enabled and the source receives a mix of the conference members minus themselves. This allows Conference members to hear each other while they are off-air.
Conf in use	Active when Conf is switched on.

### 3.17.4 Source -> DownSrc

For each source you can assign up to six Down Sources. These are sources which will be removed from the control surface when the selected source is assigned to a fader strip.

C	A		-	Treedefin	iition: / So	ource / * Micro	phone So	ources / Source	= SRC_M	IC 1
	Name	Value	Parm	PFL	Conf	Down Src	Aux	Aux Switch	Keys	
>	Audio Input		Down Sr	c 1				1		
>	Audio Out Only									
>	Audio Output		Down Sr	c 2						
	Conf Bus		Down Sr	с 3						
>	Connect		Down Sr	c 4						
>			Down Sr							
>	<u> </u>									
>	GP Sum		Down Sr	с б						
>	GPI/O									
>	GPI/O Network									
>	Label									
>	Level Control									
>	Logic									
>	MF Key									
>	Minimix									
	N-1 Source									
×	> * AutoMix									
	* Digital Sources									
	* External Sources									
	* Hybrid Sources									
	<ul> <li>Microphone Sources</li> </ul>									
	<ul> <li>Source</li> </ul>	SRC_MIC 1								
	> Source	SRC_MIC 2								
	> Source	SRC_MIC 3								
	> Source	SRC_MIC 4								
	> * Player Sources									
	> * Ravenna Sources									
	> * Studio Mics									
	> * Tone									
>	Sum Bus									
>	Surface									
>	System									
>	Vis Chan									



## 3.17.5 Source -> Aux / Aux Switch

Having defined **Aux 1** to **Aux 20** in the "<u>System -> Definition-> Parameter = Aux</u>", there are two ways to configure the on/off and pre/post status: either statically (if the state is to be forced) or dynamically (if the state should be toggled). The latter is ideal for operator-controlled bus assignments from a fader strip MF Key.

#### Static Bus Assignments

Use the Aux Switch source parameters to force a particular state for each bus send.

In the example below, a Logic -> NOT element has been used to create a "true" control signal. This has then been applied to the "Aux 1 Post" state to force the source to be assigned to the Aux 1 bus (in our example, this is PGM).

Name Val	ue Parm PFL	Conf Down Src Au	x Aux Switch Keys	
> Audio Input	Aux 1 Pre		Aux 1 Post TRUE.Out	Aux 1 Off
> Audio Out Only	Aux 2 Pre		Aux 2 Post	Aux 2 Off
> Audio Output				
Conf Bus	Aux 3 Pre		Aux 3 Post	Aux 3 Off
> Connect > EmBER+	Aux 4 Pre		Aux 4 Post	Aux 4 Off
> EmBER+ A-stage	Aux 5 Pre		Aux 5 Post	Aux 5 Off
GP Sum	Aux 6 Pre		Aux 6 Post	Aux 6 Off
> GPI/O	Aux 7 Pre		Aux 7 Post	Aux 7 Off
GPI/O Network				
> Label	Aux 8 Pre		Aux 8 Post	Aux 8 Off
> Level Control	Aux 9 Pre		Aux 9 Post	Aux 9 Off
> Logic	Aux 10 Pre		Aux 10 Post	Aux 10 Off
> MF Key	Aux 11 Pre		Aux 11 Post	Aux 11 Off
> Minimix > N-1	Aux 12 Pre		Aux 12 Post	Aux 12 Off
<ul> <li>Source</li> </ul>				
> * AutoMix	Aux 13 Pre		Aux 13 Post	Aux 13 Off
> * Digital Sources	Aux 14 Pre		Aux 14 Post	Aux 14 Off
* External Sources	Aux 15 Pre		Aux 15 Post	Aux 15 Off
> * Hybrid Sources	Aux 16 Pre		Aux 16 Post	Aux 16 Off
<ul> <li>* Microphone Sources</li> </ul>	August 7 Dec		Aux 17 Post	Aux 17 Off
> Source SRC_MI				
> Source SRC_MI			Aux 18 Post	Aux 18 Off
> Source SRC_MI > Source SRC_MI			Aux 19 Post	Aux 19 Off
> * Player Sources	Aux 20 Pre		Aux 20 Post	Aux 20 Off
> * Ravenna Sources				

Aux n Pre	This control input will switch the send to Aux n to pre fader.
Aux n Post	This control input will switch the send to Aux n to post fader.
Aux n Off	This control input will switch the send to Aux n Off.



### **Toggled Bus Assignments**

Use the Aux source parameters to toggle the state for each bus send.

In the example below, MF Keys 2 and 2b are assigned to the "Toggle Aux 3" and "Toggle Aux 4" states. This allows the operator to switch the bus to pre, post or off from the surface.

	OA	Treedefinition:	/ Source / * Microph	one Sources / Source =	SRC_MIC :	L	×
	Name	Value	Parm PFL	Conf Down Src	Aux	Aux Switch	Keys
	> Audio Input	dio Input				Post (	Only 🗌
	> Audio Out Only		Toggle Aux 1 Toggle Aux 2		Post Only		
	> Audio Output						
	Conf Bus		Toggle Aux 3	SRC_MIC 1.MF 2a Key		Post (	Only 🗌
	> Connect		Toggle Aux 4	SRC_MIC 1.MF 2b Key		Post (	Only 📃
	> EmBER+		Toggle Aux 5			Post (	Only 🗌
	EmBER+ A-stage GP Sum		Toggle Aux 6				Only
	> GPI/O						
	GPI/O Network		Toggle Aux 7				Dnly 🗌
	> Label		Toggle Aux 8			Post (	Only 📃
	> Level Control		Toggle Aux 9			Post (	Dnly 📃
	> Logic		Toggle Aux 10			Post (	Only
	> MF Key		Toggle Aux 11			Post (	Dnly
	> Minimix						
	> N-1		Toggle Aux 12				Only 🗌
	<ul> <li>Source</li> <li>* AutoMix</li> </ul>		Toggle Aux 13			Post (	Only 🗌
	> * Digital Sources		Toggle Aux 14			Post (	Only 📃
	* External Sources		Toggle Aux 15			Post (	Only 🗌
	> * Hybrid Sources		Toggle Aux 16				Dnly
	<ul> <li>Microphone Sour</li> </ul>	rces					
	> Source	SRC_MIC 1	Toggle Aux 17				Dnly 🗌
	> Source	SRC_MIC 2	Toggle Aux 18			Post (	Only 📃
	> Source	SRC_MIC 3	Toggle Aux 19			Post (	Only 📃
	> Source	SRC_MIC 4	Toggle Aux 20			Post (	Only
	> * Player Sources > * Ravenna Sources	-				•	
L	/ Ravenina Sources	5					
t Aux n				ce to Aux n. The hird press is off.	first pre	ess assign	is the sou
st Only	If this box is checked, then there is no pre-fader option.						



## 3.17.6 Source -> Keys

Select the **Keys** tab (in the "Source" branch of the 'Tree Definition') to name each MF Key and define how it will illuminate in response to a control signal. Note that, on a fader strip, the MF Keys are defined for the source rather than the physical fader.

The MF Key reference name is very important as until you name keys, they will not appear in the 'Tree Selection' window, and therefore cannot be assigned to functions. Each MF Key can light in a variety of colors, and can be static, blinking or half-lit to indicate different statuses.

Name Value	Parm PFL	Conf Down Src Aux Aux Switch	Keys		
Audio Input	No. of Standa	Normal 👻	Volta Dafa It Valar		
Audio Out Only	MF 1a Mode	Normal	VoMu Default Voice 🔻		
Audio Output	MF 1a Label	Mon1			
Conf Bus	ME 1a P1: Color	green 🔻	Low 🔽	Blink	Logic True.Out
Connect					
EmBER+     GP Sum	MF 1a P2: Color	yellow 🔻	Low 🗖	Blink 🕅	Logic
GP Sum	MF 1a P3: Color	red 🔻	Low	Blink 🕅	Logic Mod Monitor 1 enable.Out
GPI/O Network	ME to D4: Color	black 🗸	Low	Blink 🗖	Lesia .
Label	MF 1a P4: Color	Diack		Blink	Logic
Level Control	MF 1a P5: Color	black 🔻	Low 🗖	Blink 🗌	Logic
Logic	MF 1a P6: Color	black -	Low 🗖	Blink	Logic
MF Key	Mi Idro. Color				Logic
Minimix	MF 1a P7: Color	black 🔻	Low 🗖	Blink 🗖	Logic
4 Source	MF 1a P8: Color	black 👻	Low 🗖	Blink	Logic
▷ * Abhören ▷ * Desk		Duck		Contract Provide State	Logic
Kommando					
> *Ltg	MF 1b Label	Mon2			
* Mikrofone	MF 1b P1: Color	🗖 green 🔻	Low 🔽	Blink 🗖	Logic True.Out
Regio	MF 1b P2; Color	yellow 👻	Low 🗖	Blink	Logic
▷ * Wahl					
4 * Zuspieler	MF 1b P3: Color	red 🔻	Low	Blink 🗖	Logic Mod Monitor 2 enable.Out
<ul> <li>Source AF-An</li> <li>Source AF-Dig</li> </ul>	MF 1b P4: Color	black 🔻	Low 🗖	Blink	Logic
▷ Source Cart1					
Source Cart2	MF 1b P5: Color	black 🔻	Low 🗖	Blink 🕅	Logic
Source Cart3	MF 1b P6: Color	black 🔻	Low 🗔	Blink 🗌	Logic
Source Cart3(PLR BDF6)	MF 1b P7: Color	black -	Low	Blink	Logic
Source Cart4					Logic
Source Cart4(BDF5)	MF 1b P8: Color	black 🔻	Low 🗖	Blink 🗖	Logic
<ul> <li>Source Cart4(PLR BDF5)</li> <li>Source Digas</li> </ul>					
D Source Didas					
/IF 1 Mode	These of	ptions are for MF Ke	v 1 only:		
		-			
& VoMu Default)	<ul> <li>Selection</li> </ul>	ct Normal for normal	MF Key operation.		
,					
	<ul> <li>Selection</li> </ul>	ct either <b>Voice/Music</b>	; or Voice/Music/Off to	use the kev for	or <u>automatic switching</u> onto
	VOICE	e or Music bus.			
	Diaplay	nome for ME Key 1	This is the name which		n the control ourface as up
MF 1 Label			This is the name which	will be used o	n the control surface so us
	4 chara	cters or less.			
AE 4 D4: Color	Colocto	the color for the price	rity 1 Jamp atota Jawaa	t priority	
AF 1 P1: Color	Selects	the color for the prio	rity 1 lamp state - lowes	a priority.	
			, ,		

 MF 1 P1: Low
 The lamp will be dimmed.

 MF 1 P1: Blink
 The lamp will blink.

 MF 1 P1: Logic
 This input triggers the P1 lamp state – lowest priority.

The **Color**, **Low**, **Blink** and **Logic** options are repeated for up to 8 key states labeled **P1** to **P8** – **P1** is lowest priority; **P8** is highest priority. If more than one control signal is provided, then the lamps illuminate in priority – for example, **P8** will win over **P1**. You may use the **Low** or **Blink** options in combination with any of the colors. All options (except the **MF 1 Mode**) are repeated for each MF Key.

Only MF Keys 1, 1b, 2 and 2b have an electronic label.

Once the MF Keys have been named, their control outputs can be assigned to other functions via the 'Tree Selection' window. The control outputs are:

MF Key	Active when the key is pressed.
MF nKey	Active when the key is not pressed.

**sapphire** systems support MF Keys 6 to 9 if sources are assigned to fader strips fitted with the Rotary Extension Module.

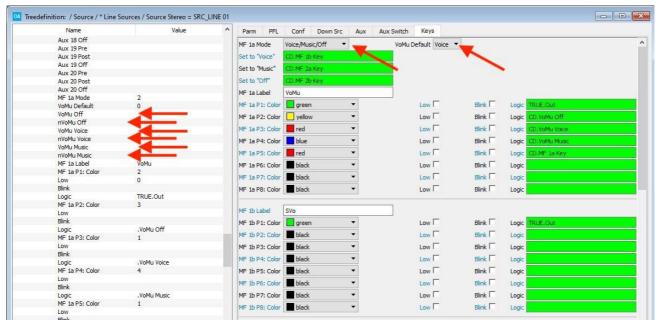


### Automatic Voice/Music Bus Switching

MF Key 1 can be used to enable or disable automatic switching from a mono, stereo or 5.1 source onto a voice or music bus. Note that these options exist for MF Key 1 only.

- > To Enable Automatic Voice/Bus Switching:
  - 1. Select the source and its MF Keys tab.
  - 2. Set the MF Mode 1 to either Voice/Music or Voice/Music/Off:
    - Voice/Music = automatic bus switching is disabled; use MF Key 1 to enable the feature.
    - Voice/Music/Off = automatic bus switching is enabled; use MF Key 1 to disable the feature.
  - 3. Set the VoMuDefault option to either Voice or Music to choose which is the default bus.

In our example, the source is set to automatically feed the Voice bus; MF Key 1 is programed to disable the Voice/Music bus switching:



# 3. 'Tree Definition' Elements



The **Set to "Voice**", **Set to "Music**" or **Set to "Off**" triggers can be used to override the current assignment in the example below, press MF Key 1b to assign the source to the Voice bus; press MF Key 2 to assign the source to the Music bus; press MF Key 2b to remove the source from both the Voice and Music bus:

Name	Value	Parm PFL	Conf Dov	in Src Aux	Aux Switch	Keys			
Audio Input		(			1				
Audio Out Only		MF 1a Mode	Voice/Music/Off	<u> </u>	VoMu E	Default Voice 🔻			
> Audio Output		Set to "Voice"	CD.MF 1b Key						
Balance Control		Set to "Music"	CD.MF 2a Key						
> Conf Bus									
Connect		Set to "Off"	CD.MF 2b Key						
Element State		MF 1a Label	VoMu						
EmBER+		2007 - 200 C 200 C				-			
GP Sum		MF 1a P1: Color	green	-		Low 🗖	Blink 🗖	Logic	RUE.Out
> GPI/O		MF 1a P2: Color	yellow	-		Low 🗖	Blink 🗌	Logic C	D. VoMu Off
GPI/O Network		MF 1a P3: Color	- rod	-		Low 🗖	Blink 🗖	Logic	D. VoMu Voice
Hidden						and the second			
> Label > Level Control		MF 1a P4: Color	blue	•		Low 🗖	Blink 🔽	Logic C	CD. VoMu Music
		MF 1a P5: Color	red	-		Low E	Blink	Logic	CD.MF 1a Key
> Logic Y MF Key									
<ul> <li>Central Module 16 (Adr. 10)</li> </ul>		MF 1a P6: Color	black	•		Low I	Blink 🗌	Logic	
KSC-LCD14P2-RGB Module 1	(Adr. 1)	MF 1a P7: Color	black	-		Low	Blink	Logic	
<ul> <li>Key Extension Module 17 (Ac</li> </ul>		MF 1a P8: Color	black	-		Low I	Blink 🕅	Logic	
Screen Button RGB Module 1		MIF 18 PO. COOI	DIACK			LOW	DIIIKI	LOGIC	
> Minimix	(Hart 2)								
Panel		MF 1b Label	SVo						
✓ Source		MF 1b P1: Color	areen	-		Low T	Blink 🗐	Logic T	RUE.Out
> * AES Sources									
> * Desk		MF 1b P2: Color	black	•		Low 🔽	Blink 🗖	Logic	
> * Groups		MF 1b P3: Color	black	-		Low 🗔	Blink 🕅	Logic	
> * Hybrids		MF 1b P4; Color	- Islands	-		Low I	Blink 🗖	Louis	
Line Sources	2852							Logic	
Source Stereo	CD	MF 1b P5: Color	black	-		Low T	Blink	Logic	
> Source Stereo	SRC_LINE 02	MF 1b P6: Color	black	<b>*</b>		Low T	Blink	Logic	
> Source Stereo	SRC_LINE 03								
> Source Stereo	SRC_LINE 04	MF 1b P7: Color	black	-		Low 🗖	Blink 🕅	Logic	
> Source Stereo	SRC_LINE 05	MF 1b P8: Color	black	-		Low 🗖	Blink	Logic	
> Source Stereo	SRC_LINE 06							10 P. 1	

#### Programing the Logic:

To define which bus is used for Voice (or Music), use the 6 **Logic** outputs from the source. In our example, Aux 1 is Voice, and Aux 2 Music:

Name	Value	Parm PFL Cor	nf Down Src Aux	Aux Switch	Keys	
> Audio Input		Aux 1 Pre		Aux 1 Post	CD. VoMu Voice	Aux 1 Off CD. VoMu Voice
Audio Out Only		Aux TPfe		AUX I POST	LD. VOML VOICE	
> Audio Output		Aux 2 Pre		Aux 2 Post	D. VoMu Music	Aux 2 Off CD. VoMu Music
Balance Control		Aux 3 Pre		Aux 3 Post		Aux 3 Off
> Conf Bus						
> Connect		Aux 4 Pre		Aux 4 Post		Aux 4 Off
Element State		Aux 5 Pre		Aux 5 Post		Aux 5 Off
EmBER+		Aux 6 Pre		Aux 6 Post		Aux 6 Off
GP Sum						
> GPI/O GPI/O Network		Aux 7 Pre		Aux 7 Post		Aux 7 Off
Hidden		Aux 8 Pre		Aux 8 Post		Aux 8 Off
> Label		Aux 9 Pre		Aux 9 Post		Aux 9 Off
> Level Control		Aux 9 Pre		AUX 9 Post		AUX 9 Off
> Logic		Aux 10 Pre		Aux 10 Post		Aux 10 Off
MF Key		Aux 11 Pre		Aux 11 Post		Aux 11 Off
> Central Module 16 (Adr. 10)						
> KSC-LCD14P2-RGB Module 1 (Adr. 1)		Aux 12 Pre		Aux 12 Post		Aux 12 Off
> Key Extension Module 17 (Adr. 11)		Aux 13 Pre		Aux 13 Post		Aux 13 Off
Screen Button RGB Module 1 (Adr. 1)		Aux 14 Pre		Aux 14 Post		Aux 14 Off
> Minimix						
> Panel		Aux 15 Pre		Aux 15 Post		Aux 15 Off
Y Source		Aux 16 Pre		Aux 16 Post		Aux 16 Off
* AES Sources     * Desk		Aux 17 Pre	7	Aux 17 Post		Aux 17 Off
> * Groups		Aux 17 Pre		AUX 17 POST		Aux 17 Off
> * Hybrids		Aux 18 Pre		Aux 18 Post		Aux 18 Off
<ul> <li>* Line Sources</li> </ul>		Aux 19 Pre		Aux 19 Post		Aux 19 Off
> Source Stereo	CD					
> Source Stereo	SRC LINE 02	Aux 20 Pre		Aux 20 Post		Aux 20 Off
> Source Stereo	SRC_LINE 03					



## 3.18 Sum Bus

The "Sum Bus" branch of the 'Tree Definition' is used to insert and configure summing buses.

Each bus can support several sets of parameters. Switch between them using the menu tabs at the top of the parameter area.

The most important fields are the Name and Type (defined in the Parm tab):

Parm	Keys				
SumBus			Туре	Mono 💌	Г
Display				Mono 🗟 Stereo	L
Alias				5.1	L
EmBER+ I	local Prov	ider No none 👻	L	R3LAY	J
List Enabl	e				·
Limiter					
Compress	or				
Equalizer					
Delay					
Contraction.					

A sum bus must be named before it can be referenced to other elements via the 'Tree Selection'.

For **Power Core**, the **Type** defines whether this is a normal summing bus (mono, stereo or surround) or a special bus such as R3LAY. For **crystal**, **sapphire compact** and **sapphire MK2**, the type is defined when you insert the summing bus element.



## 3.18.1 Sum Bus Parameters

Select the Sum Bus you wish to edit in the 'Tree Definition' and open the **Parm** tab to access its main parameters:

OA		Treedefinit	ion: / Sum Bus / *	Desk / SumBus = Sum_PG	M		×
Name	Value	Parm Keys					
> Audio Input		SumBus	Sum_PGM		Type Stereo 🔻		
> Audio Out Only		Display	PGM				
> Audio Output			1 Girl				
Conf Bus > Connect		Alias					
> EmBER+		EmBER+ Local Provider No	1	•			
> EmBER+ A-stage		List Enable					
GP Sum		Limiter	<b>v</b>				
> GPI/O		Compressor					
GPI/O Network		Equalizer					
> Label		Delay					
> Level Control		Fader Up					
> Logic > MF Key		Fader Down					
> Minimix							
> N-1		Fader Toggle					
> Source		Hold Mode					
✓ Sum Bus		Default Pos (dB)	0				
✓ * Desk		DMS Color	#FDFD14				
> SumBus							
> SumBus	Sum_Aux2 Sum_Aux3	Source Color Default	black	•			
> SumBus > SumBus		Source Color P1	green	•	Low	Blink	Logic
	Sum_Aux5	Source Color P2	yellow	-	Low	Blink	Logic
> SumBus							
	Sum_Aux7	Source Color P3	red 📃	-	Low 🗌	Blink	Logic
	Sum_Aux8	Source Color P4	black	-	Low	Blink	Logic
	Sum_PGM	Post only	_				5
> Pfl > Surface		Channel On Edge					
> System							
> Vis Chan		Channel Off Edge					
7 VID CHUI		Ch On/Off Toggle					
		Channel Mute					
		Access Key User Off					
		Parm Page User Off					
		Access					

There are identical to the corresponding <u>Source parameters</u>, with the following exceptions/additions:

- DSP must be allocated to each summing bus by ticking the Limiter, Compressor, Equalizer and/or Delay boxes.
- **Post Only** select this checkbox to limit bus assignments to post fader only (e.g. for a PGM or Group bus).

Note that you cannot assign a summing bus directly to another summing bus. However, this can be achieved by using an audio loopback and a source. First, assign the sum bus to a loopback output, and then assign the loopback return to a source. The source may then be assigned to the sum bus in the usual manner. Audio loopbacks are described <u>later</u>.



## 3.19 Surface

### 3.19.1 Surface -> Fader Module

The "Surface -> Fader Module" branch of the 'Tree Definition' defines the programmable functions of the Fader Module. The same parameters can be accessed by double-clicking on the Fader Module in the Frame -> Surface window.

Each fader strip can control any source or summing bus, and has a number of programmable functions. Note that these are configured for the source, and not the fader strip, so that when a source is moved to a different fader position, the functionality follows.

#### Fader Module -> Source

Open the "Surface -> Fader Module" branch of the 'Tree Definition', and select the **Source** tab to enable or disable layering, and configure the default sources for each fader strip.

• Treedefinition: / Surface / Fader Module (	JI) 955/10 01 (Adr. 01)
Name Audio Input Audio Out Only Audio Output	Source       Direct Out       Module       PFL1Swap       Channel Mapping       Snapshots       MF Key Mapping       VisChan1       VisChan2       VisChan3       VisChan4         Module (Label)       M 1
Balance Control Conf Bus > Connect Element State > EmBER+ > GP Sum > GP1/O > Logic > Logic > Logic > Logic > Logic > Logic > Logic > Minimix > Panel > Source > Sum Bus > Surface > Sum Bus > Surface > Central Module (Adr. 10) > Module > Alarm > General > Fader Module (full) 955/10 02 (Adr. 02) > Fader Module (full) 955/10 02 (Adr. 02)	Default Source 1.1       SRC_MIC DJ.Src       Only Default [         Default Source 1.2       SRC_MIC 02.Src       Only Default [         Default Source 1.3       TelFeed.Src       Only Default [         Default Source 1.4       SRC_HYBRID 02.Src       Only Default [         Default Source 2.1       Only Default [       Default Source 2.2         Only Default [       Default Source 2.3       Only Default [         Default Source 2.4       Only Default [       Default Source 2.4
Fader Module (full) 955/10 03 (Adr. 03)     Ender Module (full) 055/10 04 (Adr. 04)  Module	
	The reference name for the Module.
Disable Layer 2	Not available for crystal. Tick this box to disable Layer 2 switching. This will disable the <b>ACCESS</b> <b>2</b> keys on the Fader Module. Once Layer 2 is disabled, the <b>ACCESS 2</b> key can be reassigned to another function by defining MF Key 5 for the source, see <u>Source -&gt; Keys</u> .
Default Sources	Assigns a default source or sum bus to the fader strip. This source is loaded whenever the configuration is transferred, or the system is reset using a cold start. You can permanently assign this source to the fader strip by ticking <b>Only Default</b> .
	• Use boxes 1.1, 1.2, 1.3, 1.4 to assign Layer 1, strips 1 to 4
	• Use boxes 2.1, 2.2, 2.3, 2.4 to assign Layer 2, strips 1 to 4
Only Default	Tick this box if you wish the <b>Default Source</b> to be permanently assigned to the fader strip.



### Fader Module -> Direct Out

Open the "Surface -> Fader Module" branch of the 'Tree Definition', and select the **Direct Out** tab to enable a direct out for the fader strip. If two layers are supported, then there are eight entries:

- 1.1, 1.2, 1.3, 1.4 assigns Layer 1, strips 1 to 4.
- 2.1, 2.2, 2.3, 2.4 assigns Layer 2, strips 1 to 4.

OA Treedefinition: / Surface / Fader Module (finition)											
Name	Source	Direct Out	Module	PFL1 Swap	Channel Mapping	Snapshots	MF Key Mapping	VisChan1	VisChan2	VisChan3	VisChan4
> Audio Input	Module	D	01								
> Audio Out Only											
> Audio Output	Out 1.1										
Balance Control Conf Bus	Pre Fader										
> Connect	Pre Sig										
Element State	FIC Sig										
> EmBER +		-									
> GP Sum	Out 1.2										
> GPI/O	Pre Fader										
> GPI/O Network											
Hidden	Pre Sig										
> Label		11									
> Level Control	Out 1.3										
> Logic											
> MF Key	Pre Fader										
> Minimix	Pre Sig										
> Panel											
> Source											
> Sum Bus	Out 1.4										
✓ Surface	Pre Fader										
> Central Module (Adr. 10)	Pre Sig										
<ul> <li>Fader Module (full) 955/10 01 (Adr. 01)</li> </ul>	Pre sig										
> Module (Label)											
> Module	Out 2.1										
> Alarm	Pre Fader										
> General	101 X405										
> Fader Module (full) 955/10 02 (Adr. 02)	Pre Sig										
> Fader Module (full) 955/10 03 (Adr. 03)											
Fader Module (full) 955/10 04 (Adr. 04)	0.122										
Dut X.x	Assign t	ne audi	o outpi	ut for the	Direct Out						
Pre Fader	Assign a	contro	l signa	l to swit	ch the Direc	t Out pr	e fader				

You can combine the **Pre Fader** and **Pre Sig** control signals to configure the following options:

Assign a control signal to switch the Direct Out pre processing.

• Pre fader, pre processing.

Pre Sig

- Pre fader, post processing.
- Post fader, pre processing.
- Post fader, post processing (default).



### Fader Module -> Module

Open the "Surface -> Fader Module" branch of the 'Tree Definition', and select the **Module** tab to monitor the status of a control surface mode.

OA Treedefinition: / Surface / Fader Module (full) 9	55/10 01 (Ad	ir. 01)										
Name	Source	Direct Out	Module	PFL1 Swap	Channel Mapping	Snapshots	MF Key Mapping	VisChan1	VisChan2	VisChan3	VisChan4	
> Audio Input	Alarm	5	Surface 1									
> Audio Out Only												
> Audio Output	General	S	Surface 1									
Balance Control												
Conf Bus												
> Connect												
Element State												
> EmBER+ > GP Sum												
> GP Sum > GPI/O												
> GPI/O Network												
Hidden												
> Label												
> Level Control												
> Logic												
> MF Key												
> Minimix												
> Panel												
> Source												
> Sum Bus												
✓ Surface												
> Central Module (Adr. 10)												
<ul> <li>Fader Module (full) 955/10 01 (Adr. 01)</li> </ul>												
> Module (Label)												
> Module												
> Alarm												
> General												
> Fader Module (full) 955/10 02 (Adr. 02)												
> Fader Module (full) 955/10 03 (Adr. 03)												
> Fader Module (full) 955/10 04 (Adr. 04)												
Key Extension Module (Adr. 11)												
> Rotary Extension Module (channel mode) 01 (Ad												
> Rotary Extension Module (channel mode) 02 (Ad												
> Rotary Extension Module (channel mode) 03 (Ad												
> Rotary Extension Module (channel mode) 04 (Ad												
> System												
> Vis Chan												
lorm	ntor th	0.0000	o to ho	dianlorra	d in the Ale	rm Loc	Sonvor for t	ho mor				
larm E	inter th	e name	e io be	usplaye	d in the Ala	ini Log	Server for t	ine moo	Jule.			

Alarin	Enter the name to be displayed in the Alarm Log Server for the module.
General	Enter the general purpose name for the module.

Once the **Alarm** field is named, the following control outputs appear under the "Surface -> Module" branch of the 'Tree Selection' window:

Alarm Surface N failed	This output is true when the surface alarm for the module is active.
------------------------	--



### Fader Module -> PFL1 Swap

The PFL 1 Swap function can be used to swap the PFL 1 bus for another listen bus on each fader strip. You can use this to configure different PFL outputs for different fader strips. This is particularly useful if the console supports multiple operating stations.

Open the "Surface -> Fader Module" branch of the 'Tree Definition', and select the PFL1 Swap tab.

Name	Source	Direct Out	Module	PFL1 Swap	Channel Mapping	Snapshots	MF Key Mapping	VisChan 1	VisChan2	VisChan3	VisChan4
> Audio Input	Ch. 1. 1 use	PEL	default	-							
> Audio Out Only			default								
> Audio Output	Ch. 1. 2 use		PFL 2								
Balance Control	Ch. 1.3 use		PFL 3								
Conf Bus			PFL 4								
> Connect	Ch. 1.4 use	PFL:	PFL 5								
Element State	Ch. 2. 1 use	PFL:	default	-							
> EmBER+											
> GP Sum	Ch.2.2 use	PFL:	default	•							
> GPI/O	Ch.2.3 use	PFL:	default	-							
> GPI/O Network				-							
Hidden	Ch.2.4 use	PHL: [	default	•							
> Label											
> Level Control											
> Logic											
> MF Key											
> Minimix											
> Panel											
> Source											
> Sum Bus											
✓ Surface											
Central Module (Adr. 10)											
<ul> <li>Fader Module (full) 955/10 01 (Adr. 01)</li> </ul>											
> Module (Label)											
> Module											
> Alarm											
> General											
Fader Module (full) 955/10 02 (Adr. 02)											

Use the ChX.x field to select the PFL bus which will be used by the fader strip. The options are:

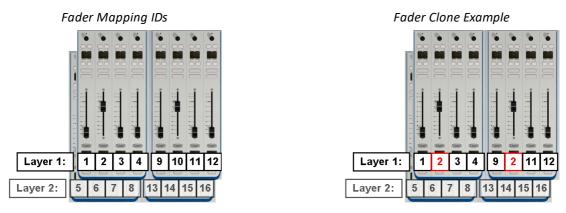
- **Default** = PFL 1 (the predefined PFL bus)
- PFL 2 to PFL 5 the user-defined buses configured in "System -> Definition -> Parameter = PFL Mode".



### Fader Module -> Channel Mapping

Any fader strip can be mapped to a different control surface position using fader mappings. The system works by giving every fader strip a unique mapping ID. This includes faders on Layer 1 and Layer 2 for all Fader Modules.

MF Keys, defined by the configuration, can then reassign any fader ID to any control surface position. For example, a fader can be cloned by assigning the same ID to two positions. Move one of the cloned faders, and the other follows; select a new source for the fader, and the other follows.



The mapping numbers identify both layers. Therefore Module 1 contains Faders 1 to 4 and 5 to 8; Module 2 starts at Fader 9 and so on.

There are three main applications for fader mappings:

- To clone a fader as shown above.
- To move fader strips for example, to rearrange the layout for different types of production.
- To map invisible fader strips onto physical faders to create additional "layers".

The first two applications are particularly useful for multi-operator layouts, as faders can be cloned at different operator stations, or the control surface can be re-configured from single to multi-user.



### >> Channel Mapping Parameters

- 1. Select the Fader Module you wish to edit from the "Surface" branch of the 'Tree Definition'.
- 2. Select the Channel Mapping menu tab:

Name	Source	Direct Out Mo	dule PFL1 Swap	Channel Mapping	Snapsho	ts MF K	ey Mapping	VisChan1	VisChan2	VisChan3	VisChan4	
Audio Input	Default Mar	Activate	default map.Key									
Audio Out Only Audio Output	Mars 1	Activate	Map1.Kev		1.1 17	1.2 18	1.3 19	1.4 20	2.1 21	2.2 22	2.3 23	2.4 24
Balance Control	Map 1:	Activate	мартжеу		1.1 1/		-	i —	2.1 21	2.2 22	i —	2.4 24
Conf Bus	Map 2:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Connect	Map 3:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Element State EmBER +	Map 4:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
GP Sum	Map 5:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
GPI/O GPI/O Network	Map 6:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Hidden	Map 7:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Label Level Control	Map 8:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Logic	Map 9:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
MF Key	Map 10:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Minimix Panel	Map 11:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
Source Sum Bus	Map 12:	Activate			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4
<ul> <li>Surface</li> <li>Central Module (Adr. 10)</li> <li>Fader Module (full) 955/10 01 (Adr. 0</li> <li>Module (Label)</li> <li>Module (Label)</li> </ul>	1)											
efault Map	Assigns	o control (	signal to act	ivoto the de		odor o	onning					

Activate	Assigns a control signal to activate the deladit lader mapping.
Map n Activate	Assigns a control signal to activate.fader mapping 1 to 12.
Map n 1.1, 1.2, 1.3, 1.4, etc.	<ul> <li>Enter the fader ID numbers which will be mapped to the Fader Module when the Map n</li> <li>Activate control signal is true.</li> <li>Use 1.1 to 1.4 to map Layer 1, strips 1 to 4.</li> <li>Use 2.1 to 2.4 to map Layer 2, strips 1 to 4.</li> <li>You must enter the absolute fader ID, which is counted from 1 through to 8 for each Module (faders 1 to 4 on Layer 1, and faders 5 to 8 on Layer 2). For example, to map the third fader on the second layer of Module 2, you would enter 15 (as the second layer of Module 2 is counted as faders 9 to 16).</li> </ul>





### Fader Module -> Snapshots

Open the "Surface -> Fader Module" branch of the 'Tree Definition', and select the **Snapshots** tab to isolate fader strips from snapshot loads. For example, if there is more than one operator, you may wish to use snapshots to reset some faders and not others.

Name	Source	Direct Out	Module	PFL1 Swap	Channel Mapping	Snapshots	MF Key Mapping	VisChan 1	VisChan2	VisChan3	VisChan4
Audio Input	0						7 11 2				
Audio Out Only	Cn. 1. 1 Sna	pLoad disable (	(Default Map)								
Audio Output	Ch. 1.2 Sna	pLoad disable (	(Default Map)	)							
Balance Control	Ch 1 2 See	pLoad disable (	Default Man								
Conf Bus											
Connect	Ch. 1.4 Sna	pLoad disable (	(Default Map)	)							
Element State	Ch 2 1 Sea	pLoad disable (	(Default Man)								
> EmBER+											
> GP Sum	Ch.2.2 Sna	pLoad disable (	(Default Map)	)							
> GPI/O	Ch 2 3 Spa	pLoad disable (	(Default Man)								
> GPI/O Network											
Hidden	Ch. 2.4 Sna	pLoad disable (	(Default Map)								
> Label											
> Level Control											
> Logic											
> MF Key											
> Minimix											
> Panel											
Source											
Sum Bus											
/ Surface											
Central Module (Adr. 10)											
<ul> <li>Fader Module (full) 955/10 01 (Adr. 01)</li> </ul>											
> Module (Label)											
> Module											
> Alarm											
> General											
Fader Module (full) 955/10 02 (Adr. 02)											
> Fader Module (full) 955/10 03 (Adr. 03)											

When the **SnapLoad disable (Default Map)** option is active, all Source, Sum and Assign parameters remain unchanged if a snapshot is loaded.

- Use Ch 1.1 to 1.4 to isolate Layer 1, strips 1 to 4.
- Use Ch 2.1 to 2.4 to isolate Layer 2, strips 1 to 4.

The <u>Default Map</u> positions determine which channels are isolated.

This option applies to all types of snapshot: internal memories and Vistool full/source snapshots. It has no affect when snapshots are saved. Generally, all channels are included when saving.



### Fader Module -> MF Key Mappings

MF Key mappings can be used to swap the functions of MF Keys according to the production or user requirements.

Note that the mappings affect all MF Keys on the Fader Module. So, to change the function of MF Keys globally across the console, remember to modify the MF Key Mappings for all Fader Modules. MF Key mappings are stored as a "one-shot" setup in the configuration. This means that you will need to upload a new configuration to change from one set of MF Key mappings to another.

Open the "Surface -> Fader Module" branch of the 'Tree Definition', and select the **MF Key Mapping** tab to configure MF Key mappings.

Name	Source	Direct Out	Module	PFL1 Swap	Channel Mappir	ng	Snapshots		MF Key Mapping	VisChan 1	VisChan2	VisChan3	VisChan4
> Audio Input	MF1a	G	MF1a	<b>•</b>	MF1b	METH		•					
> Audio Out Only	ML 10	lo lo											
> Audio Output	MF2a	1	MF2a	-	MF2b	MF2b		•					
Balance Control	MF3		MF3	-									
Conf Bus		-											
> Connect	MF4	1	MF4	-									
Element State	MF5		MF5	-									
> EmBER+													
> GP Sum	MF6	1	MF6	-									
> GPI/O	MF7		MF7	-									
GPI/O Network				-									
Hidden	MF8		MF8	•									
> Label	MF9	1	MF9	-									
> Level Control		_											
> Logic													
> MF Key													
> Minimix													
> Panel													
Source													
> Sum Bus													
✓ Surface													
> Central Module (Adr. 10)													
<ul> <li>Fader Module (full) 955/10 01 (Adr. 01)</li> </ul>													
> Module (Label)													
> Module													
> Alarm > General													

In each case, use the drop-down menu to assign a logical MF Key to the physical MF Key. Note that MF 1 to 9 correspond to the MF Keys on a sapphire with a Key Extension module.

Once the configuration is uploaded, the MF Keys on the selected Fader Module will update accordingly.

### Fader Module -> VisChan

These parameters are identical to the ones accessed via the "VisChan" branch of the 'Tree Definition'.



### 3.19.2 Surface -> Central Module

The "Surface -> Central Module" branch of the 'Tree Definition' defines the programmable functions of the Central Module. The same parameters can be accessed by double-clicking on the Central Module in the Frame -> Surface window.

#### Central Module -> Keys

Open the "Surface -> Central Module" branch of the 'Tree Definition', and select the **Keys** tab to define the MF Key name and its lamp color/state. These parameters are identical to those on a fader strip (described <u>earlier</u>).

Name	Keys 18	Keys 916 Keys 17	24 Keys 2528	Keys 2936 Keys 3744	Keys 4546	/CA Module	
> Audio Input	MF 1	MON PGM 2.0	3				
> Audio Out Only					Blink 🗖	1.00	
> Audio Output	P1 Color	green		Low 🔽		Logic	TRUE.Out
Balance Control Conf Bus	P2 Color	yellow	-	Low 🗔	Blink 🕅	Logic	3
> Connect	P3 Color	red	*	Low 🗖	Blink	Logic	MON MAIN LR. Out 1
Element State		the second se					
> EmBER+	P4 Color	black	•	Low 🗖	Blink 🗔	Logic	
> GP Sum	P5 Color	black	-	Low 🗖	Blink	Logic	
> GPI/O	P6 Color	black	<b>*</b>	Low E	Blink	Logic	
> GPI/O Network							
Hidden	P7 Color	black	•	Low 🗖	Blink 🗖	Logic	
> Label	P8 Color	black	-	Low T	Blink	Logic	
> Level Control							
> Logic	1.000						
> MF Key	MF 2	Mon PGM 5.1					14
> Minimix	P1 Color	green	-	Low 🔽	Blink 🗐	Logic	TRUE.Out
> Panel > Source	P2 Color	red	*	Low 🗖	Blink	Logic	MON MAIN LR. Out 2
> Sum Bus		the second s					and a standard and a
✓ Surface	P3 Color	red	•	Low 🗖	Blink 🕅	Logic	
<ul> <li>Central Module (Adr. 10)</li> </ul>	P4 Color	black	-	Low 🗖	Blink 🗖	Logic	
> Module (Label)	P5 Color	black	<b>~</b>	Low I	Blink	Logic	
Fader Module (full) 955/10 01 (Adr. 01)						-	
> Fader Module (full) 955/10 02 (Adr. 02)	P6 Color	black	•	Low 🗖	Blink 🗖	Logic	
Eader Module (full) 955/10.03 (Adr. 03)	D7 Color	black	-	Low E	pliel/	Locic	

To configure the MF Key functions, assign the MF Key to the required function from the 'Tree Selection' window. For example, the MF Key below will switch the output of a TConn64 monitor source selector to PGM:





### **Central Module -> VCA**

These parameters configure the rotary 'VCA' controls on the Central Module:

Treedefinition: / Surface / Central Module (	Adr. 10)								
Image: Sum Busice / Sum Busice / Central Module (           Name           Audio Input           Audio Out Only           Audio Output           Balance Control           Conf Bus           Connect           Element State           EmBER+           GP2/O           Server           GP2/O           Label           Label           Level Control           Logic           MF Key           Sim Bus           Source           Sum Bus           Surface           Y Gentral Module (Adr. 10)           Fader Module (ful) 955/10 01 (Adr. 01)           Fader Module (ful) 955/10 02 (Adr. 02)           Fader Module (ful) 955/10 02 (Adr. 03)	Kar. 107         Keys 18       Keys 916       Keys 1724       Keys 2528       Keys 3744       Keys 4546       VCA       Module         Control 1       Nue SPK       Default Gain (dB)       -30       Gain Step Width       3dB       -30         Gain Step Width       3dB       Set Default Gain (dB)       -30       Gain Sync Input       Balance Sync Input         Balance Sync Input       D       D       D       -30       Gain Step Width       3dB       -30         Gain Step Width       3dB       Set Default Gain (dB)       -30       -30       -30       -30         Gain Step Width       3dB       Set Default Gain (dB)       -30       -3								
Control n	Enter a reference name for the control on the Central Module.								
Name	Enter the name which will appear on the OLED display beside the control. characters.	You can enter up to 6							
Default Gain (dB)	Enter a default value in dB. Note that -60dB corresponds to - infinity. This gain is applied after a cold start and whenever the Set Default Gain co below) is active.	ontrol signal (see							
Gain Step Width	Select an option from the drop-down menu. This sets the gain to change in 3dB or 5dB.	steps of 1dB, 2dB,							
Set Default Gain	Assign a control signal to activate the <b>Default Gain</b> value. For example, yo warm start control signal if you wish the level to be reset after a restart.	ou could assign the							
Gain Sync Input		Assign the output of another <u>Level Control</u> . You can use this parameter to link controls. For example, to have the headphone level follow the studio monitor level or vice versa.							
Balance Enable	Tick this box to enable balance control. When enabled, operators can push control to adjust balance.	down and turn the							
Balance Sync Input	Assign the output of another <u>Balance control</u> . You can use this parameter t example, to have the headphone balance follow the studio monitor or vice v								

### **Central Module -> Module**

These parameters are configured in a similar manner to the Module Parameters on a Fader Module.





## 3.20 System -> Definition

This branch of the 'Tree Definition' defines the system's global options.

The tables below list all possible elements according to their order in the menu tabs: Audio, Logic, Madi, etc.

### Audio

'System -> Definition'	Application	r	С	SC	S	N29
Parameter = Aux	Define the 20 summing buses which can be assigned from the control surface.	~	✓	~	~	×
<u>Audio = Internal</u>	Define the frequency switching for the internal LineUp signals and the system-wide talkback sources ( <b>Sys TB</b> ).	~	✓	~	~	×
Parameter = Sync	Define the sync reference parameters.	$\checkmark$	$\checkmark$	✓	$\checkmark$	$\checkmark$
Parameter = Meter	Set the reference levels and metering options for the control surface and VisTool.	~	~	~	~	✓
Parameter = Insert	Configure external insert devices.	$\checkmark$	×	✓	$\checkmark$	×
Parameter = TieLine Stereo	Configure 32 Stereo Tie Lines (for dynamic assignment of signals to/from a MADI link).	~	~	~	~	×
<u>Parameter = Signal</u> <u>Present</u>	Define the signal present indicator on the fader strips.	~	~	~	~	×
Parameter = Surround Downmix	Define the downmix parameters (used when a surround source is routed to a stereo summing bus).	~	~	~	~	×
Parameter = PFL Mode	Configure the PFL modes for each listen bus.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×
<u>Parameter = Mic</u> <u>AutoGain</u>	Sets the AutoGain target level (used during the AutoGain measurement process for microphone sources).	~	~	~	~	×

### Logic

'System -> Definition'	Application	r	С	SC	S	N29
Parameter = Settings	Define options for the console surface.	✓	$\checkmark$	$\checkmark$	$\checkmark$	×
Parameter = Faders	Define options for the faders.	$\checkmark$	✓	✓	$\checkmark$	×
Parameter = Timers	Define options for the six standard timers.	✓	✓	✓	$\checkmark$	✓
Parameter = Screen	Define general settings for VisTool functions.	✓	✓	✓	$\checkmark$	✓
Parameter = PowerUp	Define actions to occur after power-up.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$

### Madi, OAC, TCP, Alarm, Protools

'System -> Definition'	Application	r	С	SC	S	N29
Parameter = MADI	Define parameters for the MADI ports.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Parameter = OnAirControl	Configure inputs and outputs to control or respond to functions within an external Radio Automation System (RAS).	✓	✓	~	✓	×
Parameter = TCP Link	Define the TCP/IP connections to other systems within the control network.	✓	~	~	~	✓
Parameter = Alarm	Define options for the Global Alarm and external Alarm Log Server.	✓	✓	✓	$\checkmark$	$\checkmark$
Protools	Assign central control functions from the Mackie-HUI™ protocol.	✓	×	×	$\checkmark$	×



### Ember+

'System -> Definition'	Application	r	С	SC	S	N29
Parameter = Local Consumers	Define the TCP/IP configuration required for the system to act as an Ember+ consuming device.	~	~	~	~	✓
Parameter = Local Providers	Define the TCP/IP configuration required for the system to act as an Ember+ providing device.	~	~	~	~	~

### Ravenna

'System -> Definition'	Application	r	С	SC	S	N29
Parameter = Stream Announcement	Define the mDNS and SAP channels used for stream announcement.	~	×	×	×	×
Parameter = PTP Settings	Define the PTP settings for Power Core.	✓	×	×	×	×
Parameter = Control Settings	Define the control settings applicable to RAVENNA.	~	×	×	×	×
Parameter = Stream Settings	Define the global settings for transmit (Tx) and receive (Rx) streams.	~	×	×	×	×
<u>Parameter = Jitter</u> <u>Classes</u>	Define the Jitter Classes supported by Power Core, and their Time Offset Additions (applied during stream tuning).	~	×	×	×	×

### Project

'System -> Definition'	Application	r	С	SC	S	N29
<u>Parameter =</u> <u>Description</u>	Define text fields which are displayed in the Web UI (to describe the project and system).	✓	✓	~	~	~

### Access Grp, Matrix AccGrp

'System -> Definition'	Application	r	С	SC	S	N29
Parameter = Settings 1	Define options for the surface (applicable to Access Group 1).	✓	$\checkmark$	✓	$\checkmark$	×
Parameter = Faders 1	Define options for the faders (applicable to Access Group 1).	$\checkmark$	$\checkmark$	$\checkmark$	✓	×
<u>Parameter =</u> <u>Snapshots</u>	Define options for snapshots.	~	~	~	~	×
Parameter = Logic Snapshots	Define up to 32 logical states to be saved with every snapshot.	✓	~	~	~	×
Parameter = Element States Snapshots	Define up to 8 element states to be saved with every snapshot.	✓	~	~	~	×
Parameter = Central Menu	Configure control of the DSP pages on the surface: INP, DYN, EQ, etc.	✓	~	✓	~	×
Parameter = Bus Menu	Configure control of the BUS assign pages 1 to 5.	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	×
Parameter = VCA Group Menu	Configure control of the VCA assign pages 1 and 2.	~	✓	~	~	×
Parameter = Extension Menu	Configure control of the page buttons on the Key Extension panel.	~	×	×	~	×
Parameter = Matrix Snapshot	Define up to 128 matrix connections to be saved with every snapshot.	✓	×	✓	~	×



### 3.20.1 Parameter = Aux

#### "System -> Definition -> Parameter = Aux"

This branch of the 'Tree Definition' defines the 20 summing buses which can be assigned from the control surface. Note that the bus locations are called **Aux 1** to **Aux 20**, although they may be used for any type of bus: PGM, REC, AUX, etc.

Once a bus is assigned to an "Aux n" location, it will become available to the operator via the **BUS** assign buttons on the Central Module (unless the **Hide** option is active). Up to five pages can be configured, where Aux 1 to 4 will appear on page one; Aux 5 to 8 on page two; and so on.

Select "System -> Definition" in 'Tree Definition' and the Audio tab to access the "Parameter = Aux" options:

OA .		Treedefinitio	on: / Syst	tem / Defi	inition				×						
Name	Value	Audio	Logic	Madi	OAC	Serial	ТСР	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matri	ix AccGrp 1	
> Audio Input		Parameter	r		Aux										
> Audio Out Only		Screen Bu		1	Aux Text		-								
> Audio Output															
Conf Bus		Screen Bu			Empty		•								
> Connect		Aux Mode		Э	Pre - Pos		•								
> EmBER+		"Off" Colo	r		gree	en 👘	-								
> EmBER+ A-stage		"Pre" Colo	or		red		-								
GP Sum		"Post" Col	lor		yello	w	•								
> GPI/O		Aux1			Sum_PG				Hi	de 🗌		Ead	er Enable		
GPI/O Network										de T			er Enable		
Label     Level Control		Aux2			Sum_RE										
> Logic		Aux3			Sum_Au					de 📃			er Enable		
> MF Key		Aux4			Sum_Au	x2.Src			Hi	de 🕅		Fad	er Enable		
> Minimix		Aux5							Hi	de 📃		Fad	er Enable		
> N-1		Aux6							Hie	de 🕅		Fad	er Enable		
> Source		Aux7							Hi	de		Fad	er Enable		
> Sum Bus		Aux8							Hi	de 🗌		Fad	er Enable		
> Surface		Aux9								de 🗍		Fad	er Enable		
<ul> <li>System</li> <li>Definition</li> </ul>		Aux10								de 🗌			er Enable		
> MADI Card Slot 8		Aux11								de 🗍			er Enable		
> Vis Chan		Aux12								de T			er Enable		
										de 🗌			er Enable		
		Aux13													
		Aux14								de 🗌			er Enable		
		Aux15							Hi	de 🕅		Fad	er Enable		
		Aux16							Hie	de 🕅		Fad	er Enable		
		Aux17							Hi	de 📃		Fad	er Enable		
		Aux18							Hie	de 🥅		Fad	er Enable		
		Aux19							Hi	de 🕅		Fad	er Enable		
		Aux20							Hi	de 🕅		Fad	er Enable		

Parameter	Aux – reference name for the element.
Screen Button Text	Defines the text displayed on VisTool "bus assign" buttons. Select <b>Aux Text</b> if you wish to inherit the aux bus Display name.
Aux Mode Sequence	<ul> <li>Defines the order in which bus assignments are made; you can select between:</li> <li>Pre - post -off</li> <li>Post - pre - off</li> </ul>
"Off", "Pre", "Post" Colors	Defines the MF Key colors used for aux assignments. The default colors are Aux Off = green; Aux Pre = red; Aux Post = Yellow.
Aux 1 to 20	Assigns the summing bus defined as "Aux n".
Hide	Tick this box if you do not want the bus to be displayed on the Fader Module OLEDs when in 'Bus Assign' mode. Use this option to prevent operators from adjusting assignments onto a bus (e.g. PGM).
Fader Enable	Assigns the control trigger which will switch the bus send levels onto the faders (globally across the console).



### 3.20.2 Audio = Internal

#### "System -> Definition -> Audio = Internal"

This branch of the 'Tree Definition' defines the frequency switching for the internal LineUp signals and the system-wide talkback sources.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Audio = Internal" options:

OA				Tre	edefinitior	n: / Syster	n / Definit	ion					×
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
> Audio Input		AUXIO							піц				
> Audio Out Only		Aux19							Hid	le 🗌		Fade	er Enable
> Audio Output		Aux20							Hid	le 🗌		Fade	er Enable
Conf Bus													
Connect		Audio			Internal								
EmBER+		LineUp 1	oot f=620										
EmBER+ A-stage													
GP Sum		LineUp 1	set f=400	ΗZ									
> GPI/O		LineUp 1 s	et f=1kHz										
GPI/O Network		LineUp 1	set f=12.5	kHz									
> Label		Sys TB 1											
> Level Control													
Logic		Sys TB 2											
> MF Key		Sys TB 3											
Minimix		Sys TB 4											
N-1		Sys TB 5											
Source		Sys TB 6											
> Sum Bus													
> Surface		Sys TB 7											
<ul> <li>System</li> </ul>		Sys TB 8											
> Definition													

Audio	Internal – reference name for the element.
Line Up set f = n Hz	<ul> <li>Assigns input control signals to set the frequency of the Line Up signal. If no input signal is assigned or true, then the generator defaults to 1kHz.</li> <li>The number of LineUp signals is determined by the product, or for Power Core the active license: <ul> <li>Power Core Edge, SAN and Radio L = 1 LineUp signal</li> <li>Power Core Radio XL = 2 LineUp signals</li> <li>Power Core Max = 4 LineUp signals</li> </ul> </li> </ul>
Sys TB	Assigns the audio signals to be used for system-wide talkback. These can be inserted into a "Minmixer Sys TB" (via the <u>Sys TB</u> tab). On <b>crystal</b> , two signals can be assigned: <b>Sys TB 1</b> and <b>Sys TB 2</b> . On <b>sapphire</b> , <b>sapphire compact</b> and <b>Power Core</b> , up to eight signals can be assigned: <b>Sys TB 1</b> to <b>8</b> . Any two can be used in each Minimixer Sys TB.



### 3.20.3 Parameter = Sync

#### "System -> Definition -> Parameter = Sync"

This branch of the 'Tree Definition' configures the system's sync reference parameters. See Synchronisation for more about the sync reference options and how to use the Web UI to check the sync status.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = Sync" options:

OA	Treedefinition: / System / Defini	tion		×		
Name Value	Audio Logic Madi	OAC Serial	TCP Alarm	EmBER+ Ravenna	Project AccessGrp 1	Matrix AccGrp 1
Audio Input						
Audio Out Only	Sys TB 2					
Audio Output	Sys TB 3					
Conf Bus						
Connect	Sys TB 4					
EmBER +	Sys TB 5					
GP Sum				_		
GPI/O	Sys TB 6					
GPI/O Network	Sys TB 7					
Label						
Level Control	Sys TB 8					
Logic						
MF Key	Parameter	Sync				<b>\</b>
Minimix		▼				
Source	Enable Sync from PTP					
Sum Bus	Enable Sync from Madi					
Surface	Fachle Come Come MICLIC					
4 System	Enable Sync from WCLK					
Definition	Sync Prio	2 PTP-WClk-Madi	-			
MADI Card Slot 8	Enable SampleRate Switch			SampleRate 44.1kHz		
Vis Chan	Enable Samplekate Switch			Samplekate 44. IKHZ		

Parameter	Sync – reference name for the element.
Enable Sync from PTP, MADI, etc.	When no boxes are ticked, the system is synchronised to internal system clock (either 48kHz or 44.1kHz, see <b>Enable Samplerate Switch</b> below.) To sync to an external reference, select the relevant tick boxes.
Sync Prio	If more than one sync source is enabled, then this menu sets the prioritization order.
Enable Samplerate Switch	Select this tick box to enable the 44.1kHz sample rate switch (described below).
Samplerate 44.1kHz	Selects a logic control signal to switch the system sample rate from 48kHz (default) to 44.1kHz. To switch the sample rate you must check the <b>Enable Samplerate Switch</b> box AND apply a logic control signal.

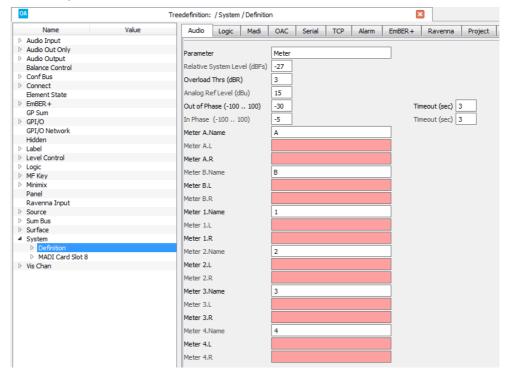


### **3.20.4 Parameter = Meter**

"System -> Definition -> Parameter = Meter"

This branch of the 'Tree Definition' sets the reference levels and metering options for the control surface and VisTool.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = Meter" options:



Parameter	Meter – reference name for the element.
Relative System Level (dBFs)	Sets the relative system level in dBFS, see System Reference Levels.
Overload Thrs (dBR)	Sets the overload metering point. Set the <b>Overload Threshold</b> to 3dB above the working point to encourage good operating practice.
Analog Ref Level (dBu)	Sets the analog reference level in dBu, see System Reference Levels.
Silence Thrs low (dBR)	Enter the level at which the silence detect will become active for crystal meter channels.
Silence Thrs high (dBR)	Enter the level at which the silence detect will become inactive. Use these two values to set a range to avoid flicker.
Silence Timeout low (sec)	Enter the period of time, for which the level must be below the defined threshold to activate the silence detect. Use 0 for immediate signalisation.
Silence Timeout high (sec)	Enter the period of time, for which the level must be above the defined threshold to deactivate the silence detect.

The Meter A, Meter B and Meter 1 to 4 entries define the six stereo meters which can be displayed within VisTool. For each stereo meter you can define:

Meter Name	Enter a reference name for the meter.
Meter L, Meter R	Assign a source to the left and right meter inputs.



### System Reference Levels

	DIN	SMPTE
Relative System Level	- 27	- 38
Analog Reference Level	15	24
Operating Level (analog)	+6 dBu	+ 4 dBu
Operating Level (digital)	- 9 dBFS	-20dBFS

The **Relative System Level** and **Analog Reference Level** are options defined in the configuration. They combine to set the operating levels (analog and digital) for the system.

With **Relative System Level** (dBFS) you define the relative working point internally within the system. This value can be calculated with the formula "RSL = - digital headroom - 18" or "RSL = working point -18dB".

For example, the working point (0 dBr) for the ARD (German Broadcasters' Network) is at -9 dBFS. From this follows a **Relative System Level** (dBFS) of -27. Note that the working point is important as dynamics and limiter modules refer to this value. When the threshold value is set to 0 dB, the absolute level equals the working point.

If required, the **Relative System Level** and **Analog Reference Level** can be edited using the ON-AIR Designer. Start by opening the existing configuration, and then edit the **Relative System Level (dBFS)** and **Analog Ref Level (dBu)** options in the 'Tree Definition' (shown below).

ON-AIR Designer Tree Definition: "System -> Definition -> Parameter = Meter"

OA	Treedefinition:	/ System	/ Definitio	n				Đ	3		
Name Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	T
Audio Input											-
Audio Out Only	Paramete	r		Meter							
Audio Output											
Balance Control	Relative S	System Le	vel (dBFs)	-27							
Conf Bus	Overload	Thrs (dBR	)	3							
Connect											
Element State	Analog Re	et Level (d	Bu)	15					_		
EmBER+	Out of Ph	ase (-100	100)	-30				Tir	neout (sec)	3	
GP Sum	In Phase	( 100 1	00)	-5				T.	neout (sec)		
▷ GPI/O			.00)	-3				'''	neour (sec)	<b></b>	
GPI/O Network	Meter A.N	lame		Α							
Hidden	Meter A.L										
D Label											
Level Control     Logic	Meter A.F	2									
Logic     MF Key	Meter B.N	lame		в							
	Meter B.L										
Panel	Meter D.L										
Ravenna Input	Meter B.R	t -									
Source	Meter 1.N	lame		1							
Sum Bus				-							
Surface	Meter 1.L										
▲ System	Meter 1.R	L L									
Definition	Meter 2.N	lame		2				_			
MADI Card Slot 8				-							
Vis Chan	Meter 2.L										
	Meter 2.R	l.									
	Meter 3.N	lame		3							
	Meter 3.L										
	Meter 3.R	L									
	Meter 4.N	lame		4							
	Meter 4.L										
	Meter 4.R	L									

Then save and transfer the edited configuration to the DSP Core. For more information about the configuration tool, please see the "ON-AIR Designer User Guide". This is available from the **Downloads** area at <u>www.lawo.com</u> (after **Login**).



### **Phase Correlation**

The following control outputs can be found in the 'Tree Selection', under the branch "Logic -> Definition -> Parameter Meter". These can be used to signal when a stereo meter signal is out of phase.

• Treese	lection			? ×
▲ Logic				
	Microphone Sources			
⊳ *F	Player Sources			
⊿ De	finition			
Þ	Audio	Internal		
Þ	Parameter	Alarm		
⊳	Parameter	Aux		
⊳	Parameter	Bus Menu 1		
⊳	Parameter	Central Menu 1		
⊳	Parameter	Extension Menu 1		
$\triangleright$	Parameter	Faders		
⊳	Parameter	Faders 1		
$\triangleright$	Parameter	Logic Snapshots 1		
$\triangleright$	Parameter	Madi		
⊿	Parameter	Meter		
	Meter A.Out of Phase			
	Meter B.Out of Phase			
	Meter 1.Out of Phase			
	Meter 2.Out of Phase			
	Meter 3.Out of Phase			
	Meter 4.Out of Phase			
⊳	Parameter	OnAirControl		
$\triangleright$	Parameter	PFL Mode		
⊳	Parameter	PowerUp		
			ОК	Cancel

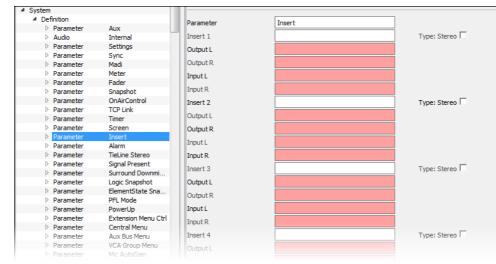


### 3.20.5 Parameter = Insert

#### "System -> Definition -> Parameter = Insert"

This branch of the 'Tree Definition' configures the insert devices. You can use any audio inputs and outputs for the connections to a mono or stereo insert device.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = Insert" options:



Parameter	Insert – reference name for the element.
Insert N	Enter a name for the insert. This is both the reference name and the name which will be displayed on the control surface, so use 6 characters or less.
Type: Stereo	When checked the insert device is treated as a stereo device, and when unchecked a mono device – see the notes above.
Output L Output R	Assign the outputs (sends) to the insert device.
Input L Input R	Assign the inputs (returns) from the insert device.



### 3.20.6 Parameter = TieLine Stereo

#### "System -> Definition -> Parameter = TieLine Stereo"

This branch of the 'Tree Definition' supports 32 Stereo Tie Lines which can be used to dynamically assign signals onto a MADI link between two compatible systems. This is useful if the number of inputs and outputs you wish to share exceeds that of the available MADI links.

To use this feature you must configure the **TCP Link** under "<u>System -> Definition -> Param = TCPLink</u>", and **Stereo Tie Line** options for sending and receiving systems.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = TieLine Stereo" parameters:

OA		Treedefinition:	/ Systen	n / Definitio	on				D	3		
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER +	Ravenna	Project	Acc
Audio Input												_
Audio Out Only		Paramete	r		TieLine	Steren						
Audio Output										_		
Balance Control		Desk Inpu	it 01		M_IN_0	001.Inp			Matrix	Output No.	129	
Conf Bus		Desk Inpu	ut 02		M IN C	03.Inp			Matrix	Output No.	131	
Connect										·	_	
Element State		Desk Inpu	it 03						Matrix	Output No.	)	
EmBER+		Desk Inpu	ut 04						Matrix	Output No.	0	
GP Sum		Desk Inpu	+ 05						Matrix	Output No.		
GPI/O GPI/O Network										·		
Hidden		Desk Inpu	it 06						Matrix	Output No.	)	
Label		Desk Inpu	ut 07						Matrix	Output No.	0	
Level Control		Desk Inpu	it 08						Matrix	Output No.	2	
Logic		Deal Tran	+ 00						Makin			
MF Key		Desk Inpu	IE 09						Matrix	Output No.		
Minimix		Desk Inpu	ıt 10						Matrix	Output No. 0	ו כ	
Panel		Desk Inpu	it 11						Matrix	Output No.	2	
Ravenna Input										·		
Source		Desk Inpu	ıt 12						Matrix	Output No.	)	
Sum Bus		Desk Inpu	it 13						Matrix	Output No.	)	
<ul> <li>Surface</li> <li>System</li> </ul>		Desk Inpu							Mahring	Output No.		
Definition		Desk Inpu	10 14						Maurix			
MADI Card Slot 8		Desk Inpu	ıt 15						Matrix	Output No.	)	
Vis Chan		Desk Inpu	it 16						Matrix	Output No.	0	
		Desk Inpu	ıt 17						Matrix	Output No.	2	

Parameter	TieLine Stereo – reference name for the element.
Desk Input 01 to 32	Enter the physical input used for the incoming Tie Line.
Matrix Output Nr	Enter the matrix address of the output from the external system.
MNOPL	Select this checkbox to enable the MNOPL protocol to use stereo tie lines with a Nova73.



### 3.20.7 Parameter = Signal Present

#### "System -> Definition -> Parameter = Signal Present"

This branch of the 'Tree Definition' defines the signal present indicator on the fader strips.

The fader strip backlight can be configured to show signal present, source color or to run in mix mode for each source configured in the "Source" branch of the 'Tree Definition', see <u>Source Color</u>.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = Signal Present" options:

> Logic         State 3 Thrs (dBR)         -1         Low I         Bink I         Color         Jewar           > MF Key         State 3 Thrs (dBR)         -1         Low I         Bink I         Color         Jewar           P MF Key         State 5 Thrs (dBR)         -3         Low I         Bink I         Color         Jewar           P and         Ravens liput         State 4 Thrs (dBR)         -9         Low I         Bink I         Color         green           > Source         State 3 Thrs (dBR)         -9         Low I         Bink I         Color         green            > Surgace         State 3 Thrs (dBR)         -9         Low I         Bink I         Color         green            > Surgace         State 3 Thrs (dBR)         -9         Low I         Bink I         Color         green            > Surface         State 1 Thrs (dBR)         -30         Low I         Bink I         Color         green            > Definition         State 0 (Default)         Default         Low IV         Bink I         Color         Green            > Vs Chan         Vs Chan         State 0 (Default)         Default         Low IV         Bink I	OA		Treedefinition:	/System	/Definition	on				6	3									
<ul> <li>Add Out Only</li> <li>Add Out Only</li> <li>Desk Input 129</li> <li>Desk Input 129</li> <li>Desk Input 130</li> <li>Matrix Output No. 0</li> <li>Desk Input 31</li> <li>Desk Input 32</li> <li>Matrix Output No. 0</li> <li>Level Control</li> <li>State 3 Thrs (dBR) 6</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>Panel</li> <li>State 5 Thrs (dBR) -3</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>Reventa Input</li> <li>State 3 Thrs (dBR) -15</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>Surface</li> <li>State 3 Thrs (dBR) -30</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>State 3 Thrs (dBR) -30</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>State 3 Thrs (dBR) -30</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>State 3 Thrs (dBR) -30</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color green</li> <li>State 3 Thrs (dBR) -30</li> <li>Low Γ</li> <li>Bink Γ</li> <li>Color gree</li></ul>	Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp	1 Matri	x AccGrp 1	1				
Desk Input 29       Matrix Output No. 0         Balance Control       Desk Input 30         Desk Input 30       Matrix Output No. 0         Desk Input 31       Matrix Output No. 0         Desk Input 32       Matrix Output No. 0         Benert State       Desk Input 32         Desk Input 32       Matrix Output No. 0         P EnBER +       MMOR         GP JAN       Matrix Output No. 0         P EnBER +       MMOR         GP JAN       Formatter         P Idden       Span Present         Holden       State 3 Thrs (BR)         D Label       State 5 Thrs (BR)         D Label       State 5 Thrs (BR)         D Label       State 5 Thrs (BR)         D Mininx       State 5 Thrs (BR)         D Mininx       State 5 Thrs (BR)         D Mininx       State 5 Thrs (BR)         D Source       State 3 Thrs (BR)         D Source       State 0 Thrs (BR)	Audio Input		Desk Inp	it 28		· · · · ·				Matrix	Output No.	0								
Balance Cutrol       Desk Input 30       Matrix Output No. 0         Cornect       Desk Input 31       Matrix Output No. 0         Benerst State       Desk Input 32       Matrix Output No. 0         Benerst State       Desk Input 32       Matrix Output No. 0         Benerst State       Desk Input 32       Matrix Output No. 0         Benerst State       Desk Input 32       Matrix Output No. 0         GP JO       GP JO       F         GP JO Network       F       Bink       Color F desk         GP JO Network       F       State 8 Thrs (dBR) 6       Low Г       Bink Г       Color F desk         I Lebel       State 8 Thrs (dBR) 3       Low Г       Bink Г       Color F desk       Gold F desk         I Logic       State 8 Thrs (dBR) 3       Low Г       Bink Г       Color F desk       Gold F desk         D Logic       State 6 Thrs (dBR) 3       Low Г       Bink Г       Color F desk       Gold F desk         S Surget       State 4 Thrs (dBR) 1.15       Low Γ       Bink Γ       Color F desk       Gold F desk         S Surget       State 4 Thrs (dBR) 3.0       Low Γ       Bink Γ       Color F desk       Gold F desk         S Surget       State 3 Thrs (dBR) 3.0       Low Γ       Bink Γ																				
○ CorrRus       ○ corrRus         ○ CorrRus       ○ corrRus         ○ CorrRus       ○ corrRus         ○ Benent State       ○ corrRus         ○ BenBCx+       ○ corrRus         @ Stan       ○ corrRus         ○ Gr1/O       ○ corrRus         @ Stan       ○         > Gr1/O       ○         @ Stan       ○         > Gr1/O       ○         @ State SThrs (dBR)       6       Low □       Bink □       Color □ red         > Label       ○       State SThrs (dBR)       6       Low □       Bink □       Color □ red         > Lobel       ○       State SThrs (dBR)       3       Low □       Bink □       Color □ red         > Lobel       ○       State SThrs (dBR)       -1       Low □       Bink □       Color □ red         > Minkox       State SThrs (dBR)       -3       Low □       Bink □       Color □ red         > Surface       State SThrs (dBR)       -15       Low □       Bink □       Color □ red         > Surface       State SThrs (dBR)       -15       Low □       Bink □       Color □ red         > Surface       State SThrs (dBR)       -3       Low □       Bink □       Col			Desk Inpi	ut 29						Matrix	Output No.	0								
> Connect     Desk Input 31     Matrix Output No. 0       > Emement State     Desk Input 32     Matrix Output No. 0       > BRBR+1     MMORL     Matrix Output No. 0       @ PLM     O       @ PLM     F       > GPLO     State 3 Thrs (dBR)     6       > Lobel     State 3 Thrs (dBR)     6       > Lobel     State 5 Thrs (dBR)     3       > Lobel     State 5 Thrs (dBR)     -1       > Lobel     State 5 Thrs (dBR)     -3       > Mr Key     State 5 Thrs (dBR)     -1       > Minimx     State 5 Thrs (dBR)     -3       > Marker     Bink C     Color green       Ravenos Input     State 3 Thrs (dBR)     -3       > Surgec     State 3 Thrs (dBR)     -15       > Surgec     State 3 Thrs (dBR)     -20       > Surgec     State 1 Thrs (dBR)     -30       > More Carl State 3 Thrs (dBR)     -30     Low C       > Surgec     State 1 Thrs (dBR)     -30       > Surgec     State 1 Thrs (dBR)     -30       > Motor Carl State     State 0 Default     Default       > Motor State     State 0 Default     Default			Desk Inpu	ut 30						Matrix	Output No.	0								
> Orielt State       Desk Input 32       Matrix Output No. 0         > EmBert State          > GPLO       GPLO         GPLO Hetwork       Farameter         Hidden       State 8 Thrs (dBR)       6         Lobel       State 7 Thrs (dBR)       3         Lobel       State 7 Thrs (dBR)       3         Lobel       State 7 Thrs (dBR)       3         Minitix       Ravena Input       Bink □       Color I yellow         Minitix       State 7 Thrs (dBR)       -1       Low □       Bink □       Color I yellow         Minitix       Ravena Input       State 7 Thrs (dBR)       -3       Low □       Bink □       Color I green         Parameter       State 7 Thrs (dBR)       -3       Low □       Bink □       Color I green         Namix       Ravena Input       State 7 Thrs (dBR)       -3       Low □       Bink □       Color I green         > Surface       State 3 Thrs (dBR)       -15       Low □       Bink □       Color I green         > Surface       State 2 Thrs (dBR)       -20       Low □       Bink □       Color I green         > Surface       State 1 Thrs (dBR)       -30       Low □       Bink □       Color I green <tr< td=""><td></td><td></td><td>Deck Top</td><td>+ 31</td><td></td><td></td><td></td><td></td><td></td><th>Matrix</th><td>Output No</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>			Deck Top	+ 31						Matrix	Output No	0								
Definition       State 3 Thrs (dBR)       -         Definition       State 4 Thrs (dBR)       -         Definition       State 4 Thrs (dBR)       - <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>																				
GP Sum       MORL         GPLO       GPLO         GPLO Network       Parameter         Hidden       State 8 Thrs (dBR)         Label       State 8 Thrs (dBR)         D Loy Control       State 7 Thrs (dBR)         Joing Control       State 7 Thrs (dBR)         Minix       State 6 Thrs (dBR)         Minix       State 6 Thrs (dBR)         Minix       State 6 Thrs (dBR)         Minix       State 7 Thrs (dBR)         Panel       State 7 Thrs (dBR)         State 7 Thrs (dBR)       -3         Low Control       Bink Coolor         State 7 Thrs (dBR)       -3         Low Control       Bink Coolor         State 7 Thrs (dBR)       -3         Low Control       Bink Coolor         State 7 Thrs (dBR)       -3         State 7 Thrs (dBR)       -3         State 7 Thrs (dBR)       -3         Low Control       Bink Coolor         State 7 Thrs (dBR)       -3         State 7 Thrs (dBR)       -3         Low Control       Bink Coolor         State 7 Thrs (dBR)       -3         Low Control       Bink Coolor         State 7 Thrs (dBR)       -3			Desk Inpi	ut 32						Matrix	Output No.	0								
GP Sum       Parameter       Signal Present         Hdden       State 8 Thrs (dBR)       6       Low Г       Bink Г       Color         b Label       State 8 Thrs (dBR)       3       Low Г       Bink Г       Color         b Logic       State 6 Thrs (dBR)       -1       Low Γ       Bink Γ       Color         b Minix       State 5 Thrs (dBR)       -1       Low Γ       Bink Γ       Color         Panel       State 5 Thrs (dBR)       -3       Low Γ       Bink Γ       Color         Panel       State 4 Thrs (dBR)       -3       Low Γ       Bink Γ       Color         S sum Bus       State 4 Thrs (dBR)       -3       Low Γ       Bink Γ       Color         S sum Bus       State 2 Thrs (dBR)       -3       Low Γ       Bink Γ       Color         S sum Bus       State 2 Thrs (dBR)       -3       Low Γ       Bink Γ       Color         S sum Bus       State 2 Thrs (dBR)       -30       Low Γ       Bink Γ       Color         S system       State 1 Thrs (dBR)       -30       Low Γ       Bink Γ       Color         V B Charlos       State 0 Default       Low Γ       Bink Γ <td< td=""><td></td><td></td><td>MNOPL</td><td></td><td></td><td>Г</td><td></td><td></td><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>			MNOPL			Г														
GPT(J) Network       Parameter       Signal Present         Hdden       State 3 Thrs (dBR)       6       Low □       Bink □       Color ■ det         > Label       State 3 Thrs (dBR)       6       Low □       Bink □       Color ■ det         > Lop(C       State 3 Thrs (dBR)       3       Low □       Bink □       Color ■ det         > Lop(C       State 6 Thrs (dBR)       -1       Low □       Bink □       Color ■ gene □         > Mrinkx       State 5 Thrs (dBR)       -3       Low □       Bink □       Color ■ gene □         Panel       State 4 Thrs (dBR)       -3       Low □       Bink □       Color ■ gree □         > Suruce       State 3 Thrs (dBR)       -3       Low □       Bink □       Color ■ gree □         > Suruce       State 3 Thrs (dBR)       -9       Low □       Bink □       Color ■ gree □         > Suruce       State 3 Thrs (dBR)       -9       Low □       Bink □       Color ■ gree □         > Suruce       State 3 Thrs (dBR)       -20       Low □       Bink □       Color ■ gree □         > Surbace       State 1 Thrs (dBR)       -20       Low □       Bink □       Color ■ gree □         > Notificate       State 0 Thrs (dBR)       -30 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><th></th><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>																				
Hdden       State 3 Thrs (dBR)       G       Low       Bink       Color       red         b Label       State 7 Thrs (dBR)       3       Low       Bink       Color       yelow         b Logic       State 7 Thrs (dBR)       3       Low       Bink       Color       yelow         b Logic       State 7 Thrs (dBR)       -1       Low       Bink       Color       yelow         b MF Key       State 5 Thrs (dBR)       -1       Low       Bink       Color       yelow         P Minix       State 5 Thrs (dBR)       -3       Low       Bink       Color       gene         P and       State 3 Thrs (dBR)       -3       Low       Bink       Color       gene         S State 7 Thrs (dBR)       -3       Low       Bink       Color       gene       Gold gene						· ·				-										
> Label         State 3 Thrs (dBR)         6         Low I         Bink I         Color greet           > Label         State 7 Thrs (dBR)         3         Low I         Bink I         Color greet           > Lagic         State 7 Thrs (dBR)         -1         Low I         Bink I         Color greet           > MF Key         State 7 Thrs (dBR)         -3         Low I         Bink I         Color greet           Panel         Ravena Iput         State 7 Thrs (dBR)         -3         Low I         Bink I         Color greet           > Sun Bus         State 3 Thrs (dBR)         -3         Low I         Bink I         Color greet           > Sur Bus         State 3 Thrs (dBR)         -3         Low I         Bink I         Color greet           > Sur Bus         State 3 Thrs (dBR)         -3         Low I         Bink I         Color greet           > Sur Bus         State 3 Thrs (dBR)         -3         Low I         Bink I         Color greet           > Sur Bus         State 1 Thrs (dBR)         -30         Low I         Bink I         Color greet           > State 3 Thrs (dBR)         -30         Low I         Bink I         Color greet         Color greet           > State 1 Thrs (dBR)         -30 </td <td></td> <td></td> <td>Paramete</td> <td>97</td> <td></td> <td>Signal P</td> <td>resent</td> <td></td> <td></td> <th></th> <td></td>			Paramete	97		Signal P	resent													
De Legic         State 7 Thrs (dBR)         3         Low         Bink         Color         yelow           De Legic         State 6 Thrs (dBR)         -1         Low         Bink         Color         yelow           De Merice         State 6 Thrs (dBR)         -1         Low         Bink         Color         yelow           Panel         State 5 Thrs (dBR)         -3         Low         Bink         Color         gener           Panel         State 5 Thrs (dBR)         -3         Low         Bink         Color         gener           Panel         State 7 Thrs (dBR)         -9         Low         Bink         Color         gener           Panel         State 7 Thrs (dBR)         -9         Low         Bink         Color         gener           Panel         State 7 Thrs (dBR)         -9         Low         Bink         Color         gener           P Source         State 2 Thrs (dBR)         -9         Low         Bink         Color         gener           D Surface         State 2 Thrs (dBR)         -20         Low         Bink         Color         gener           > D Surface         State 0 Thrs (dBR)         -20         Low         Bink         Color </td <td></td> <td></td> <td>State 8 T</td> <td>hrs (dBR)</td> <td></td> <td>6</td> <td></td> <td></td> <td></td> <th></th> <td>Low</td> <td></td> <td></td> <td></td> <td></td> <td>Blink 🗐</td> <td></td> <td>Co</td> <td>lor 📕 red</td> <td>-</td>			State 8 T	hrs (dBR)		6					Low					Blink 🗐		Co	lor 📕 red	-
Navena Input     State 4 Thrs (dBR)     -9     Low I     Bink I     Color     green       D Source     State 3 Thrs (dBR)     -15     Low I     Bink I     Color     green       D Source     State 3 Thrs (dBR)     -20     Low I     Bink I     Color     green       D Surface     State 2 Thrs (dBR)     -20     Low I     Bink I     Color     green       > System     State 1 Thrs (dBR)     -30     Low I     Bink I     Color     green       > Definition     State 0 Default     Low IV     Bink I     Color     green       > Vs Chan     State 0 Default     Default     Low IV     Bink I     Color			State 7 T	hrs (dBR)		3					Low					Blink 🗐		Co	lor vellow	v 🔻
State 4 Thrs (dR)     -9     Low I     Bink I     Color     green       > Source     State 3 Thrs (dR)     -15     Low I     Bink I     Color     green       > Sur Bus     State 3 Thrs (dR)     -20     Low I     Bink I     Color     green       > Surface     State 2 Thrs (dR)     -20     Low I     Bink I     Color     green       > System     State 1 Thrs (dR)     -30     Low I     Bink I     Color     green       > befinition     State 0 Thrs (dBR)     -30     Low I     Bink I     Color     green       > befinition     State 0 Thrs (dBR)     -30     Low I     Bink I     Color     green       > Vs Ghan     Vs Ghan     Default     Low IV     Bink I     Color     black											Low	_				Plat				
Navena Input     State 4 Thrs (dBR)     -9     Low I     Bink I     Color     green       D Source     State 3 Thrs (dBR)     -15     Low I     Bink I     Color     green       D Source     State 3 Thrs (dBR)     -20     Low I     Bink I     Color     green       D Surface     State 2 Thrs (dBR)     -20     Low I     Bink I     Color     green       > System     State 1 Thrs (dBR)     -30     Low I     Bink I     Color     green       > Definition     State 0 Default     Low IV     Bink I     Color     green       > Vs Chan     State 0 Default     Default     Low IV     Bink I     Color						<u> </u>														
Navena Input     State 4 Thrs (dBR)     -9     Low I     Bink I     Color     green       D Source     State 3 Thrs (dBR)     -15     Low I     Bink I     Color     green       D Source     State 3 Thrs (dBR)     -20     Low I     Bink I     Color     green       D Surface     State 2 Thrs (dBR)     -20     Low I     Bink I     Color     green       > System     State 1 Thrs (dBR)     -30     Low I     Bink I     Color     green       > Definition     State 0 Default     Low IV     Bink I     Color     green       > Vs Chan     State 0 Default     Default     Low IV     Bink I     Color			State 5 T	hrs (dBR)		-3					Low					Blink 🗐		Co	lor 🔄 green	-
D Sum Rus         State 2 Thrs (dBR)         -20         Low         Bink         Color         green           S Sufface         State 1 Thrs (dBR)         -30         Low         Bink         Color         Green           > b Cefinition         State 1 Thrs (dBR)         -30         Low         Bink         Color         Green           > b Cefinition         State 1 Opefault         Low         Bink         Color         Green           > Vis Chan         Vis Chan         Color         Default         Low         Bink         Color         Bink			State 4 T	hrs (dBR)		-9					Low	_				Blink		Co	lor areen	
> Sum Bus         State 2 Thrs (dBR)         -20         Low Г         Bink Г         Color green           > Surface         State 1 Thrs (dBR)         -30         Low Γ         Bink Γ         Color green           > System         State 1 Thrs (dBR)         -30         Low Γ         Bink Γ         Color green           > Definition         State 0 Default         Low Γ         Bink Γ         Color green           > Vs Chan         State 0 Default         Low Γ         Bink Γ         Color green																				
Surface         State 2 Intrs (dBR)         -20         Low I <sup>-1</sup> Bink I <sup>-</sup> Coor is green           4 System         State 1 Thrs (dBR)         -30         Low I <sup>-</sup> Bink I <sup>-</sup> Color is green           b Definition         State 0 Default         Low I <sup>-</sup> Bink I <sup>-</sup> Color is green           > MADI Card Stot 8         Vis Chan         Vis Chan         Environ         Bink I <sup>-</sup> Color is green			State 31	hrs (dBR)		-15														
System     State 1 Thrs (dBR)     State 0 (Default)     Default     Low      Default     Low      Bink     Color     Bink     Color     Default     Color     Default     Color			State 2 T	hrs (dBR)		-20					Low					Blink 🗌		Co	lor 🚺 green	-
▷ Definition         State 0 (Default)         Default         Low IF         Blink □         Color ■ black           ▷ MADI Card Stot 8         >			State 1 T	hre (dRD)		-30					Low	-				Blink		Co		
MADI Card Slot 8     Vis Chan	<ul> <li>Definition</li> </ul>									-										
b Vis Chan			State 0 (I	Default)		Default					Low	~				Blink I		Co	lor 📕 black	/
Parameter Surround Downmix (db)	P Yor Grider		Paramete	r		Surroun	d Downmix	x (db)												

Parameter	Signal Present – reference name for the element.
State 1 to 8 Thrs	Enter the threshold level (dBR) at which you wish the indicator to illuminate. Please see System Reference Levels to see how the dBr values equate to your system's operating levels.
Low	Tick this box for half lit.
Blink	Tick this box for flashing.
Color	Select the color for the illumination.

In our example, the signal present indicator will illuminate as follows:

- Signals > 6dBR fully-lit red.
- Signals > -1dBR fully-lit yellow.
- Signals > -30dBR fully-lit green.
- Signals < -30dBR half-lit black (off).



### 3.20.8 Parameter = Surround Downmix

#### "System -> Definition -> Parameter = Surround Downmix"

This branch of the 'Tree Definition' defines the downmix parameters to be used when a surround source is routed to a stereo summing bus.

You may set up 5 sets of downmix parameters so that the operator may change the downmix according to their requirements. Once selected, the downmix parameters are applied globally to all surround to stereo assignments.

If a surround source is assigned to a mono bus, then the stereo downmix is converted to mono by subtracting 3dB from, and then summing, the L and R channels.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = Surround Downmix" options:

OA		Treedefinition:	/ System	/ Definitio	'n				(	×			
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
Audio Input									_				
Audio Out Only		Parameter			Surroun	d Downmix	(db)						
Audio Output		1-Lf->L			-3.5					1-Lf->R	-200		
Balance Control									=				
Conf Bus		1 - Rf -> L			-200					1 - Rf -> R	-3.5		
Connect		1-C->L			-6					1 - C -> R	-6		
Element State		1 - LFE ->			-200				=	1 - LFE -> R	200		
EmBER +		I - LFE ->	L		-200					I-LFE->R	-200		
GP Sum		1 - Ls -> L			-7.5					1 - Ls -> R	-200		
▷ GPI/O		1 - Rs -> L			-200				=	1 - Rs -> R	-7 5		
GPI/O Network			-		-200					1-K5-2K	-7.5		
Hidden		Select 1											
Label		2-Lf->L			0					2 - Lf -> R	-200		
Level Control					-				-				
Logic		2 - Rf -> L			-200					2 - Rf -> R	0		
MF Key		2 - C -> L			-3					2 - C -> R	-3		
Minimix					-				=				
Panel		2 - LFE ->	L		-3					2 - LFE -> R	-3		
Ravenna Input Source		2 - Ls -> L			0					2 - Ls -> R	-200		
<ul> <li>Source</li> <li>Sum Bus</li> </ul>		2 - Rs -> L			-200				=	2 - Rs -> R	0		
<ul> <li>Surface</li> </ul>			•		-200					2 - K3 - 2 K	U		
<ul> <li>Surface</li> <li>System</li> </ul>		Select 2											
Definition		3-Lf->L			0					3-Lf->R	0		
MADI Card Slot 8									-				
Vis Chan		3 - Rf -> L			0					3 - Rf -> R	0		
		3 - C -> L			0					3 - C -> R	0		
		3 - LEE - N			0					3 - 1 FE - N D	0		

Parameter	Surround Downmix – reference name for the element.
Lf -> L	This is the amount of signal applied from Left Front to the Stereo Left output. Levels are entered in dB.
Rf -> L	As above for Right Front.
C -> L	As above for Center.
LFE -> L	As above for LFE (Low Frequency Effect/Sub)
Ls -> L	As above for Left Surround.
Rs -> L	As above for Right Surround.
Lf -> R, etc.	Repeat as above but for levels to the Stereo Right output.
Select	Enter a control signal to make the downmix parameters active. If nothing is entered, then the first set of parameters is applied.



### 3.20.9 Parameter = PFL Mode

#### "System -> Definition -> Parameter = PFL Mode"

This branch of the 'Tree Definition' configures the PFL modes for each listen bus. To use PFL 2 to 5, you must first create a user-defined bus for each additional listen bus required. This is done using Sum Buses in the <u>usual</u> manner. Note that PFL 3, 4 and 5 are not supported by **crystal**.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = PFL Mode" options:

AO	Tr	eedefinition:	/ System	/ Definiti	on				E	3			
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
Audio Input		Paramete	r		PFL Mo	de							
Audio Out Only													
Audio Output		PFL 1 Mod	JE SUM										
Balance Control Conf Bus		PFL 1 Mod	de SUM R										
Connect		PFL 1 Mod	de PFL										
Element State		PFL 1 Mod											
EmBER+													
GP Sum		PFL 1 Mod	le PFL A										
▷ GPI/O		PFL 1 Mod	de PFL AR										
GPI/O Network		PFL 1 Mod											
Hidden													
Label     Level Control		PFL 1 Mod	le DJ										
Level Control     Logic		PFL 1 Mode AFL											
<ul> <li>MF Key</li> </ul>													
Minimix		PFL 1 Mode AFL/PFL											
Panel		PFL 1 Off											
Ravenna Input		PFL 2 Sun											
Source		PFL 2 Mode SUM											
Sum Bus													
▷ Surface		PFL 2 Mod	de SUM R										
▲ System ▶ Definition		PFL 2 Mod	de PFL										
MADI Card Slot 8		PFL 2 Mod	e PEL R										
Vis Chan													
, ho chair		PFL 2 Mod	le PFL A										
		DEL 2 May											
Parameter	PFL Mod	e – refei	rence	name	e for th	e elem	nent.						
PFL Mode x	Assigns a	Assigns a control signal to activate the corresponding PFL mode.											
PFL Off	Assigns a	Assigns a control signal to reset any active PFL buttons to off.											
PFL Swap to	Used in c	Used in conjunction with the "Fader Module -> PFL1 Swap parameter" options.											
PFL Sum		Assigns a sum bus to PFL 2 (and PFL 3, 4 & 5 on <b>sapphire</b> , <b>sapphire compact</b> and <b>Power</b>											
	Core).												
No PFL when Hotfader closed	When ch responds											<u>not fader</u> m	ode, PFL



### 3.20.10 Parameter = Mic AutoGain

"System -> Definition -> Parameter = Mic AutoGain"

This branch of the 'Tree Definition' defines the AutoGain target level.

Start by selecting "System -> Definition" in 'Tree Definition' and the Audio tab. Scroll down to access the "Parameter = Mic AutoGain" options:

AO		Treedefinition: / System / Definition	×
Name	Value	Audio Logic Madi OAC Serial TCP Alarm Ei	mBER+ Rav
Audio Input		PFL 4 Off	
Audio Out Only		PFL 5 Sum	
Audio Output		PPL 5 Sum	
Balance Control		PFL 5 Mode SUM	
Conf Bus		PEL 5 Mode SUM R	
Connect			
Element State		PFL 5 Mode PFL	
EmBER+		PFL 5 Mode PFL R	
GP Sum			
GPI/O		PFL 5 Mode PFL A	
GPI/O Network		PFL 5 Mode PFL AR	
Hidden			
Label		PFL 5 Mode PUSH	
Level Control		PFL 5 Mode DJ	
Logic		PFL 5 Mode AFL	
MF Key		PFL 5 Mode AFL	
Minimix Panel		PFL 5 Mode AFL/PFL	
Ravenna Input		PFL 5 Off	
Source			
Sum Bus		No PFL when Hotfader closed	
<ul> <li>Surface</li> </ul>			
4 System		Parameter Mic AutoGain	
Definition			
MADI Card Slot 8		Target Level (dBr) 0	

Parameter	Mic AutoGain – reference name for the element.
Target Level (dBr)	Enter the AutoGain target level in dBr. The default value is 0.



### **3.20.11 Parameter = Settings**

Within the "System -> Definition" branch of the 'Tree Definition', there are two sets of global options: "Parameter = Settings" and "Parameter = Settings 1 (2, 3, 4)", where 2, 3, 4 appear only for Power Core Max.

For a standard System Core, both sets of options are applied globally (as there is only one Access Group). For Power Core Max, the "Parameter = Settings" options are applied globally, while the "Settings x" options apply to a specific Access Group (to allow a different configuration for each surface).

"System -> Definition -> Parameter = Settings"

Select "System -> Definition" in 'Tree Definition' and the Logic tab to access the "Parameter = Settings" options:

OA		Treedefiniti	on: / Syst	tem / Defir	nition				×				
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
Audio Input     Audio Out Only     Audio Out prive     Conf Bus     Connect     EmBER+     EmBER+ A-stage     GPSum     GPI/O Network     Label     Level Control     Logic     MF Key		Paramete Pan/Bal fil Sort by LC NTSC DMS Integ Correction Gain Rese Conf'd Pa Can Bus S VCA enco	rst CD Text gration Mo n Key-LED n Display et Off nels alway speed	rs green	Setting Norma 0 0 V 500K B 0dB	   	•		·				
<ul> <li>Minimix</li> <li>N-1</li> <li>Source</li> <li>Sum Bus</li> <li>Surface</li> <li>System</li> <li>Definition</li> <li>MADI Card Slot 8</li> <li>Vis Chan</li> </ul>		Paramete Use Scale Ref Source Production Show Gro Group Fao Display Ho	+9 dB 0 dB e Fader O n Mode (S up Fader V der Values	ave Value) Values Fallback	Faders 0 V 3	s							

Parameter	Settings – reference name for the element.
Pan/Bal first	This setting defines the default function of the fader strip's rotary encoder. When there is no check in the box, the encoder controls GAIN/MIC settings first. The operator must then tap down on the control to access PAN/BAL. Check the box if you wish to reverse the priority and control PAN/BAL first.
Sort by LCD Text	When checked, sources within the source list are sorted by their <b>Display name</b> . If unchecked, the sources are sorted by their <b>Reference name</b> . The Display and Reference names are defined in <u>Source -&gt; Parm</u> .
NTSC	When checked, Delay times set in the Delay module are calculated using NTSC frames. Unchecked, the system uses PAL frames.
DMS Integration Mode	This setting defines the time constant for all PPM meters within VisTool. The options are : Ultrafast, Fast, Normal or Slow.
Correction Key-LED	Sets an offset for the LED brightness of console keys.
Correction Display	Sets an offset for the OLED brightness.
Gain Reset Off	If an input is used as a matrix input and as an input to a source: Check this box so that the source gain is unaffected if the matrix input is disconnected. Uncheck the box and the source gain is reset to 0dB IF the matrix input disconnects.
Conf'd Panels always green	When this option is off, the Conference MF Key on VisTool changes color to indicate the conference status: red = active; green = off. Turn the option on to override the color-coding so that the conference MF Key always lights in green.
Can Bus Speed	Available when the System Core = <b>Power Core</b> . Defines the CAN bus speed for the surface. This option can also be set from the 'Project' window.
VCA encoder max value	Available when the System Core = <b>Power Core</b> . This setting adjusts the maximum possible value for rotary encoders. The default is 0dB. If you wish to use rotary encoders and faders to adjust the same settings in parallel, then you should change the value to +9dB (so that VCAs have the same maximum value as faders).



### "System -> Definition -> Parameter = Settings 1"

### Select the **AccessGrp 1** tab to adjust the "**Parameter = Settings 1**" options:

AO	Treedefinition: / System / Definition						
Name	Value Audio Logic Madi OAC Serial TCP Alarm EmBER+ Ravenna Project AccessGrp 1 Matrix AccGrp 1						
<ul> <li>&gt; Audio Input</li> <li>&gt; Audio Out Only</li> <li>&gt; Audio Output</li> <li>&gt; Conf Bus</li> <li>&gt; Connect</li> <li>&gt; EmBER +</li> <li>GP Sum</li> <li>&gt; GPI/O</li> <li>GPI/O</li> <li>GPI/O</li> <li>GPI/O Network</li> <li>&gt; Label</li> <li>&gt; Level Control</li> <li>&gt; Logic</li> <li>&gt; MF Key</li> <li>&gt; Minimix</li> <li>&gt; Source</li> <li>&gt; Surface</li> <li>&gt; Surface</li> <li>&gt; Surface</li> <li>&gt; Surface</li> <li>&gt; Surface</li> <li>&gt; Surface</li> <li>&gt; MADI Card Slot 8</li> <li>&gt; Vis Chan</li> </ul>	Parameter Settings 1   Disable Ambient Light Sensor   Disable System Menu   Disable Bus Menu     Parameter   Faders 1   Dim Source Colours   User Labels Off   User Labels Off   User Labels Toggle   Enable Large User Labels   Global Switch to Layer 1   Global Switch to Layer 2   Swap ACCESS keys   Save Channel On/Off						
Parameter	Settings 1 – reference name for the element.						
Disable Ambient Light Sensor	Assigns a control input which will disable the ambient light sensor(s). Assign the TRUE.Out control output from a <u>NOT</u> gate to disable the sensor. Or, assign an M Key to provide operators with an enable/disable button.						
Disable System Menu	Available for <b>ruby</b> , <b>sapphire compact</b> and <b>sapphire</b> . Assigns a control input to disable the <b>SYS</b> button on the Central Module. This prevents operator access to the system options.						
Disable Bus Menu	Available for <b>ruby</b> . Assigns a control input to disable the <b>BUS</b> button on the Central Module. This prevents operator access to bus assign pages.						



### **3.20.12 Parameter = Faders**

Within the "System -> Definition" branch of the 'Tree Definition', there are two sets of options for the console faders: "Parameter = Faders" and "Parameter = Faders 1 (2, 3, 4)", where 2, 3, 4 appear only for Power Core Max.

For a standard System Core, both sets of options are applied globally (as there is only one Access Group). For Power Core Max, the "Parameter = Faders" options are applied globally, while the "Faders x" options apply to a specific Access Group (to allow a different configuration for each surface).

"System -> Definition -> Parameter = Faders"

Select "System -> Definition" in 'Tree Definition' and the Logic tab to access the "Parameter = Faders" options.

OA					Treedef	inition: / S	System /	Definition					×
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp
> Audio Input		Parameter	r		Setting	s							
Audio Out Only		Pan/Bal fir	rst										
> Audio Output		Sort by LC			~								
> Conf Bus			Diex		·								
> Connect		NTSC											
EmBER+		DMS Integ	gration Mod	le	UltraFa	st	•						
EmBER+ ALine		Correction	n Key-LED		0								
> GP Sum		Correction	Display		0								
> GPI/O		Gain Rese											
> GPI/O Network													
> Label		Conf'd Par	nels always	green									
> Level Control		Can Bus S	Speed		500K Bi	it	-						
> Logic		VCA enco	der max va	lue	0dB		•						
> MF Key													
> Minimix		Parameter	-		Faders								
N-1					Fauers								
> Source		Use Scale											
Sum Bus		Use Scale	0 dB										
> Surface		Ref Sourc	e Fader Of	fset									
<ul> <li>System</li> <li>Definition</li> </ul>		Production	n Mode (Sa	ve Value)									
> Vis Chan			up Fader V		<b>V</b>								
			der Values										
			der Value H										
		Group Pac	ler value n	olu Time	(12								

Parameter	Faders – reference name for the element.
Use Scale +9dB Use Scale 0dB	Assigns input control signals to switch between fader scales. The default fader scale, with nothing entered in either box, is to +9dB. To permanently set the console to a fader scale, assign a logic element which will always be true – for example, a <u>NOT gate</u> with no input.
Ref Source Fader Offset	Available when the Surface = <b>ruby</b> or <b>sapphire MK2</b> . When a source is assigned to the control surface, a reference source can be assigned at the same time. This value defines the position at which the reference source will be assigned, as an offset from the current source position. For example, on a control surface with 20 fader strips and 2 layers, if you wish the reference source to be assigned on the alternate layer, you would enter a fader offset of 20.
Production Mode (Save Value)	This option is recommended for production systems, but not for on-air. When ticked, fader levels are recalled by snapshots. When unticked, fader levels are ignored (to avoid accidental reset of an on-air source).
Show Group Fader Values Group Fader Values Fallback Group Fader Value Hold Time (sec)	The next three options are available when the Surface = <b>ruby</b> , <b>sapphire compact</b> or <b>sapphire</b> <b>MK2</b> . Enable the <b>Show Group Fader Values</b> option to show the resulting fader values applied to VCA slaves in the fader strip displays. The value shown is the combined result of the VCA and source fader. If the <b>Group Fader Values Fallback</b> option is also enabled, then the displays will revert to their default mode (e.g. source name) after a certain time period. The time period is set by the <b>Group Fader Value Hold Time</b> (in seconds).



	The next four options are available when the Surface = <b>crystal</b> .
Freeze all Channels	Assigns a control input which will disable controls on the Channel Module. You might activate this mode to dust the console!
Motor Fader Open	Initially sets the " <u>Background fader</u> " to open (after coldstart). The Background fader may be used for RAS control or the <u>Fader Up/Down/Toggle</u> logic. If you do not use any of these, you should set the fader to open (as the fader is always in the signal path).
Manual Fader Open	Initially sets the " <u>Surface fader</u> " to open. If you do not have a surface attached and use logic, RAS or any other protocol for fader control, you may set the fader to open (as the fader is always in the signal path).
Vistool Fader is	Choose the fader which is shown and controlled in Vistool. Motor Fader represents the "Background fader", while Hot Fader represents the "Surface fader". See Fader Status.



### "System -> Definition -> Parameter = Faders 1"

Then select the AccessGrp 1 tab and scroll down to access the "Parameter = Faders 1" options:

Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp
> Audio Input				1 Ididi				7 1021111	Emberer	- reavening	Troject		, addix / ideali
Audio Out Only		Parameter	r		Settings	1							
> Audio Output		Disable An	nbient Lig	ht Sensor									
Conf Bus		Disable Sy											
Connect				u									
> EmBER +		Disable Bu	is Menu										
GP Sum													
> GPI/O		Parameter			Faders 1	1							
GPI/O Network						4			<b>\</b>				
> Label		Dim Sourc	e Colours										
> Level Control		User Labe	ls On										
> Logic													
MFKey		User Labe	Is Off										
Minimix		User Labe	ls Toggle										
> Source > Sum Bus		Enable Lar	ne Heer I	abels									
> Surface			-										
System		Global Swi	tch to Lay	/er 1									
Definition		Global Swi	tch to Lay	/er 2									
MADI Card Slot 8													
Vis Chan		Swap ACC	.ESS Keys		-								
		Save Cha	nnel On/O	off									
		Fader Not	ch (initial)		Off		•						
		Enable Fa	der Notch										
		Disable Fa	der Notch	ı									
		Hot Fader	Mode (ini	itial)	Off		•						
		Enable Ho	t Fader M	lode									
		Disable Ho	t Fader N	1ode									

Parameter	Faders 1 – reference name for the element.
Dim Source Colors	Sets defined source colors to dim.
User Labels On User Labels Off User Labels Toggle	These control inputs switch User Labels on or off, or toggle their state. They can be used to configure how operators view User Labels on the surface.
Enable Large User Labels	This control input switches User Labels on the surface to large display mode.
Global switch to Layer 1	Assigns a control input to switch all Fader Modules enabled for layering to Layer 1.
Global switch to Layer 2	Assigns a control input to switch all Fader Modules enabled for layering to Layer 2.
Swap ACCESS Keys	Swaps the function of the Fader Module <b>ACCESS</b> keys 1 and 2. If <u>Layer 2 is disabled</u> in a Fader Module, then ACCESS 1 and MF 5 are swapped.
Save Channel On/Off	If ticked, the <b>Channel On/Off</b> parameter of sums and sources is stored and recalled by snapshots and memories.
Fader Notch (initial) Enable/Disable Fader Notch	Sets the initial value (active after a cold start) for the SYS menu Fader Notch option. Assigns a control input to enable or disable the Fader Notch.
Hot Fader Mode (initial) Enable/Disable Hot Fader Mode	Sets the initial value (active after a cold start) for the System menu's <u>Hot Fader Mode</u> . Assigns a control input to enable or disable Hot Fader mode.



The following control outputs appear in the 'Tree Selection'. They can be used to signal when a state is active.

🔓 Treesel	ection			? X	
EmBER	+				~
GPI/O					
▲ Logic					
▷ *N	1icrophone Sources				
⊿ De	finition				
⊳	Audio	Internal			
⊳	Parameter	Alarm			
⊳	Parameter	Aux			
⊳	Parameter	Bus Menu 1			
⊳	Parameter	Central Menu 1			
⊳	Parameter	Extension Menu 1			
4	Parameter	Faders			
	Scale +9 dB.active				
	Scale 0 dB.active				
4	Parameter	Faders 1			
	User Labels active				-
	Global Layer 1 active				
	Global Layer 2 active				
	Fader Notch active				
	Fader Notch not active				
	Hot Fader Mode active				
	Hot Fader Mode not active				
⊳	Parameter	Logic Snapshots 1			
⊳	Parameter	Madi			Ŧ
			ОК	Cancel	

Scale +9dB active	True when the +9dB fader scale is active.
Scale 0dB active	True when the 0dB fader scale is active.
User Labels active	True when User Labels are active.
Global Layer 1 active	True when the Global Layer 1 switch is active.
Global Layer 2 active	True when the Global Layer 2 switch is active.
Fader Notch active/not active	True when the Fader Notch is active (or not active).
Hot Fader Mode active/not active	True when <u>Hot Fader Mode</u> is active (or not active).



### **3.20.13 Parameter = Timers**

#### "System -> Definition -> Parameter = Timers"

This branch of the ON-AIR Designer 'Tree Definition' sets the options for the six standard timers included in every configuration. Choose a standard timer if you do not need synchronized operation.

1. Start by selecting "System -> Definition" in 'Tree Definition' and the Logic tab. Scroll down to access the timer parameters.

**ON-AIR Designer Standard Timers** 

#### OA Treedefinition: / System / Definition × Audio Logic Madi OAC Serial TCP Alarm EmBER+ Ravenna show Group Fader Values IV Name Value Audio Input Audio Out Only ☑ Group Fader Values Fallback Audio Output Display Hold Time (sec) 3 Balance Control Conf Bus Connect Element State EmBER+ Parameter Timers Timer 1.Name GP Sum Timer 1. Start Timer 1.Stop GPI/O Network Hidden Timer 1.Reset D Label Level Control Timer 1. Restart Logic MF Key Minimix Timer 2. Name Timer 2. Start Panel Timer 2. Stop Ravenna Input Timer2.Reset Source Sum Bus Timer2.Restart Surface Timer 3. Name ▲ System Timer3.Start MADI Card Slot 8 Timer 3. Stop Vis Chan Timer 3. Reset

The fields can be used to name each timer and define how it is triggered:

Parameter	Timer – reference name for the element.		
Time N Name	Enter a reference name for the timer.		
Timer N Start	Assigns a control signal to start the timer. The timer will start from its current position. If you want a key to always start the timer from 00:00:00:00, assign the same key to both the <b>Timer N Start</b> and <b>Timer N Reset</b> functions.		
Timer NStop	Assigns a control signal to stop the timer.		
Timer N Reset	Assigns a control input signal to reset the timer to 00:00:00:00.		
Timer N Restart	Assigns a control input signal to restart the timer from its current position.		

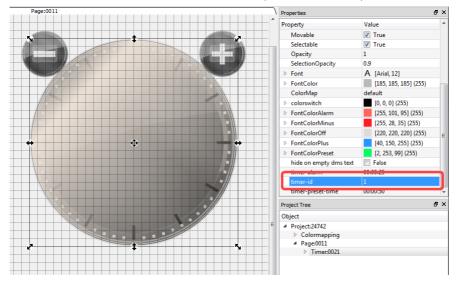
In the 'Tree Selection' window, the following outputs appear under "Logic -> Definition -> Parameter Timer". These can be used to illuminate the trigger keys and/or signal the timer alarm status:

Timer N Run	Active when the timer is running. Can be used to illuminate the MF Key controlling the timer.
Timer N Alarm	Active when the timer alarm is active.



2. Then open VisTool Editor and insert a **Timer** element in the usual manner.

Edit the **Timer ID** in the 'Properties' panel to link the element to an ON-AIR Designer timer. For standard timers, the ID numbers are fixed: Timer 1 = ID 1; Timer 2 = ID 2; and so on.



VisTool Editor Standard Timer (linked to Timer 1)

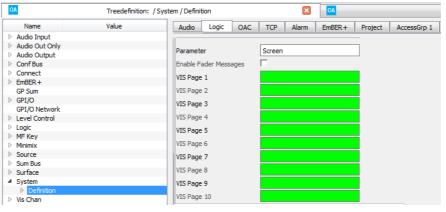


### 3.20.14 Parameter = Screen

#### "System -> Definition -> Parameter = Screen"

This branch of the 'Tree Definition' defines general settings for VisTool functions. The options apply globally to all VisTool instances.

Start by selecting "System -> Definition" in 'Tree Definition' and the Logic tab. Scroll down to access the "Parameter = Screen" options:



Parameter	Screen – reference name for the element.
Enable Fader Messages	When ticked, messages concerning fader levels are exchanged via DMS. When unticked, fader messages via DMS are disabled. The option must be ticked in order to exchange fader values with VisTool (e.g. to/from VisTool Fader elements). When enabled, there will be an increase in the amount of network traffic. If fader messages are not required (to/from other DMS devices), then the option should be disabled to reduce the volume of network traffic.
VisPage 1 to 10	Available for <b>crystal</b> , <b>sapphire</b> and <b>sapphire compact</b> . Assigns a control signal (for example, an MF Key) to switch VisTool to a particular page. You can configure switching for the first 10 VisTool pages – page index 1 to 10. Pages are switched across all VisTool instances. Thus, if you are connecting more than one VisTool and wish to configure independent page switching, please use the "Logic -> VispageSwitch" element instead.
ASSIGN State Key Pressed Transition	Available for <b>ruby</b> . Defines whether the console ASSIGN state triggers ACCESS functions in VisTool. There are two possible states: ASSIGN triggers ACCESS or ASSIGN triggers the normal state.



### 3.20.15 Parameter = PowerUp

### "System -> Definition -> Parameter = PowerUp"

This element has no parameters in the 'Tree Definition' but adds some logical states to the 'Tree Selection' window. The states can be used to action other functions – for example, to load a default snapshot on power-up.

The control outputs appear in the 'Tree Selection' window under "Logic -> Definition -> Parameter PowerUp":

ColdStart Active for one second after a cold start.			
WarmStart Active for one second after a warm start.			
Audio to Backplane	This output is true if the associated master board is active. If the master board is not active, the logic signal is false.		
M1 or M2 active	These outputs are true if the master card in Slot 1 or Slot 2 is active. They can be used in sapphire systems to trigger functions when the redundant master card becomes active.		

In the example below, the state "WarmStart" has been configured to Load Snapshot 1:

Name	Value	Audio Logic Madi	OAC TCP Alarm Extens	ion > * Off Air Record Bus Assignment	
> * Visualisation		Global Switch to Layer 1	MF_LAYER LKey	> * Off Air Record Conference	
Matrix Control Module 2 (Adr. 2)		Global Switch to Layer 2	MF_LAYER 2.Key	> * Redlight	
> Matrix 128*128 Control Module	3 (Adr. 3)			> * Special Functions	
> Screen Src Assign Module 14 (Ad	dr. E)	Swap ACCESS keys	1	> * Split Mode	
MF Key		Save Channel On/Off	Г	> * Studio	
Minimix				> * Talkback	
Panel		Fader Notch (initial)	Off 👻	> * Tone	
Source		Hot Fader Mode (initial)	Off 👻	> * User Configuration	
Sum Bus		noer daer Hode (maar)	UNI	> * Visualisation	
Surface				> DMS 1	
System		Parameter	Snapshot		
✓ Definition		in the state		✓ Definition	
> Parameter	Aux	Load Snapshot 1	MF_PANIC.Key	Sav > Audio	Internal
	Internal	Load Snapshot 2	PowerUp.WarmStart	Sav > Parameter	Alarm
> Audio		and the second		> Parameter	Aux
> Parameter	Settings	Load Snapshot 3		Sav > Parameter	Aux Bus Menu
> Parameter	Sync	Load Snapshot 4		Sav > Parameter	Central Menu
> Parameter	Madi			> Parameter	Extension Menu Ctrl
Parameter	Meter	Load Snapshot 5		> Parameter	Fader
> Parameter	Fader	Load Src Clipboard	GT_UNLOCK SECTION: Out A.1	> Parameter	Logic Snapshot
> Parameter	Snapshot	Load Sic Cipboard	GI_ONEORK SECTION: OUT A.1	> Parameter	Madi
> Parameter	OnAirControl	Save Src Clipboard	GT_UNLOCK SECTION.Out A.2	> Parameter	Meter
> Parameter	TCP Link	Balan Guideland	CT IN CONCEPTION OF LAS	> Parameter	OnAirControl
> Parameter	Timer	Delete Src Clipboard	GT_UNLOCK SECTION. Out A.3	Parameter	PFL Mode
> Parameter	Screen	Reset Channel Parameters	GT_UNLOCK SECTION. Out A.4	Parameter	PowerUp
> Parameter	Insert			ColdStart	Powerop
> Parameter	Alarm	Save Snap Unlock			
> Parameter	TieLine Stereo	Load Snap Unlock		WarmStart	
> Parameter	Signal Present	Lood on op on out		Audio to Backplane	
> Parameter	Surround Downmix (db)		-	M1 active	
		Parameter	Timer	M2 active	
> Parameter	Logic Snapshot	Timer 1.Name		> Parameter	Snapshot
> Parameter	ElementState Snapshot	Timer 1.Name		> Parameter	Surround Downmix (db)
> Parameter	PFL Mode	Timer 1. Start	MF_TIMER_START.Key	> Parameter	Sync
> Parameter	PowerUp			> Parameter	Timer
> Parameter	Extension Menu Ctrl	Timer 1.Stop	MF_TIMER STOP.Key	> Parameter	VCA Group Menu
> Parameter	Central Menu	Timer 1. Reset	MF TIMER RESET.Key	> Protools	Auto Enable
> Parameter	Aux Bus Menu			> Protools	Auto Mode
> Parameter	VCA Group Menu	Timer 1. Restart		> Protools	Edit
> Parameter	Mic AutoGain	Timer 2. Name		> Protools	Functionkeys
> Protools	V-Pot Assign			> Protools	Global
> Protools	Global	Timer2.Start		> Protools	Kevb, Shortcuts
> Protools	Auto Enable	Timer 2. Stop		> Protools	
> Protools	Auto Mode	niner 2.5 up		> Protools	Status/Group
> Protools	Window	Timer2.Reset			Transport
> Protools	Keyb, Shortcuts	-		> Protools	V-Pot Assign
		Timer2.Restart		> Protools	Window
> Protools	Functionkeys	Timer3.Name		Fader Module (full) 955/10 01 (Ad	
> Protools	Status/Group			Fader Module (full) 955/10 02 (Ad	
> Protools	Edit	Timer3.Start		> Fader Module (full) 955/10 03 (Ad	
> Protools	Transport	Timer 3. Stop		> Fader Module (full) 955/10 04 (Ad	dr. 04)
> Parameter	Matrix Snapshot	and an		> GT 1	
> Parameter	Matrix EmBER +	Timer3.Reset			
> Parameter	Local Consumers	Timer 3. Restart			OK Car
> Parameter	Local Providers	nmer3.Restart			
> Parameter	Description	Timer4.Name			
> DB Alarm Act 1	1000-2000 BALLINE		- Income and the second s		

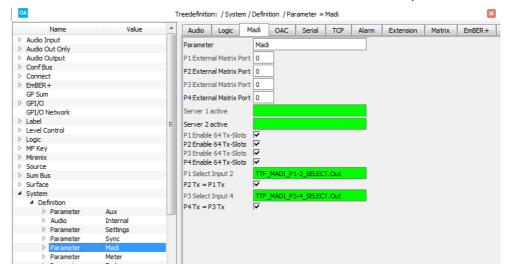


### 3.20.16 Parameter = Madi

#### "System -> Definition -> Parameter = Madi"

This branch of the 'Tree Definition' defines parameters for the MADI ports.

Select "System -> Definition" in 'Tree Definition' and the Madi tab to access the options:



Parameter	Madi – reference name for the element.
P1, 2, 3, 4 External Matrix Port	This is a project-specific feature.
Server 1 active Server 2 active	These options support a redundant matrix server. Assign a control signal to switch to server 1 or server 2.
P1 Enable 64 Tx Slots	When this checkbox is selected, the MADI port transmits 64 slots as opposed to 56. Note that the receiver automatically detects whether 56 or 64 slots are supplied. If the port is configured to transmit 64 slots and only 56 are received, then the last 8 slots are muted. The option can be selected for each individual MADI port.
P1 Select Input 2	Click to assign a control signal to switch the MADI port from P1 to P2. Note that if <u>Sync from MADI</u> is enabled, then this will also switch the MADI sync source. The option can be selected for each odd/even pair of MADI ports.
P2 Tx = P1 Tx	When this checkbox is selected, MADI port P2 transmits the same data as port P1. The option can be used to configure redundant MADI outputs. The option exists for each odd/even pair of MADI ports.

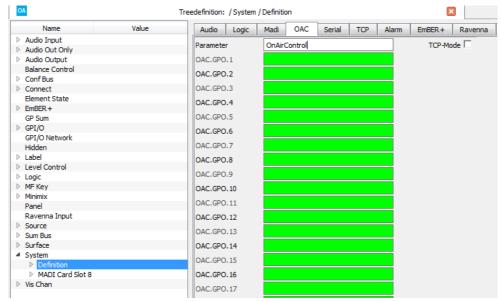


### 3.20.17 Parameter = OnAirControl

"System -> Definition -> Parameter = OnAirControl"

This branch of the 'Tree Definition' provides 64 inputs and outputs to control or respond to functions within an external Radio Automation System (RAS).

Select "System -> Definition" in 'Tree Definition' and the OAC tab to access the options:



Parameter	OnAirControl – reference name for the element.						
TCP-Mode	Check this box to enable RAS (Radio Automation System) control over TCP/IP.						
OAC GPO 1 to 64 Assign a control signal (e.g. MF Key) to each of the OAC GPOs. This allows functions within the system to remotely control functions within the Radio Automation System.							
Aux No. Musik	Enter the aux bus number dedicated to the Music signal (for RAS control).						
Aux No. Speech Enter the aux bus number dedicated to the Speech signal (for RAS control).							
The following control	autouto appear in the 'Tree Colection' under "Logic - Definition - Deremote						

The following control outputs appear in the 'Tree Selection', under "Logic -> Definition -> Parameter OnAirControl". They can be used to signal when a RAS function is active.

OAC GPI 1 to 64	Active when the allocated RAS function is active.
-----------------	---



### 3.20.18 Parameter = TCP Link

#### "System -> Definition -> Parameter = TCP Link"

This branch of the 'Tree Definition' defines the TCP/IP connections to other systems within the control network. To establish communication, you must enter the IP address of each connected system. Then assign a TCP/IP link mode to manage the network traffic. The following data exchange modes are supported:

- GNET for <u>GPI/O Network</u> data only.
- KPF for matrix control data only (via a <u>Matrix Connect</u> or <u>Matrix Query</u>).
- GKPF allows both GPI/O Network and matrix control data.
- DKPF for use with an external matrix server. This is a project-specific feature.
- GLOC for a GNET Local connection (used with Mic Arbitration).
- AIF1, AIF2 for use with the Alarm Log Server and Line Schedulers.

Start by selecting "System -> Definition" in 'Tree Definition' and the TCP tab to access the parameters:

Name	Value	^	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	Extension	Ma	atrix	EmBER+	Ravenna	Project	
System			Parameter	r	-	CP Link		-								
4 Definition					H						ſ					_
Parameter	Aux		Active TC	P Connect	ion 1	172.16.23	.5			M	lode (	GKPF				Send Context 🔽
Audio	Internal		Active TC	P Connect	ion 2	172.16.23	11			м	lode (	GNET				Send Context
Parameter	Settings										L L					
Parameter	Sync		Active TC	P Connect	on 3	172.16.23	21			M	lode	GNET				Send Context 🔽
Parameter	Madi		Active TC	P Connect	ion 4	127.0.0.1				м	lode	GLOC				Send Context
Parameter	Meter				H						L L				_	
Parameter	Fader		Active TC	P Connect	on 5					м	lode					Send Context
Parameter	Snapshot		Active TC	P Connect	on 6					M	lode					Send Context
Parameter	OnAirControl		Active TC								lode					Send Context
Parameter	TCP Link		Acuve IC	Connect						M	ioge [					
Parameter	Timer		Active TC	P Connect	on 8					M	lode					Send Context 🗌
Parameter	Screen		Active TC	D Connect	000					м	lode (					Send Context
Parameter	Insert														_	
Parameter	Alarm	=	Active TC	P Connect	ion 10					M	lode					Send Context
Parameter	TieLine Stereo		Active TC	P Connect	on 11					м	lode (					Send Context
Parameter	Signal Present Surround Down															
<ul> <li>Parameter</li> <li>Parameter</li> </ul>	Logic Snapshot		Active TC	P Connect	on 12					м	lode					Send Context
Parameter	ElementState S		Active TC	P Connect	on 13					м	lode					Send Context
Parameter	PFL Mode		Active TC	Connect							lode					Send Context
Parameter	PowerUp				-						-					
Parameter	Extension Menu		Active TC	P Connect	ion 15					M	lode					Send Context
Parameter	Central Menu		Active TC	P Connect	on 16					M	lode					Send Context
Parameter	Aux Bus Menu										L.					Sena contexe (
Parameter	VCA Group Menu		External R	louter 1	L						Map					
Parameter	Mic AutoGain		External R	louter 2												
Parameter	Matrix Snapshot		MNOPL Se		i i	-										
Parameter	Matrix EmBER +		LS Double		i i											
Parameter	Local Consumers		Surface of		ŕ											
Parameter	Local Providers		Canade of		,											

Parameter	TCP Link – reference name for the element.
Active TCP Connection	Enter the TCP/IP address for each connected system.
Mode	Then enter the <b>Mode</b> using the syntax listed above. From each system, only one link can be <b>KPF</b> or <b>GKPF</b> , except for connections to a main and redundant Master Board (sapphire).
Send Context	Tick the <b>Send Context</b> option to send the mode to the receiver. For some functions like Intercom Clients, this option must be activated.
External Router 1, 2 Map	These options are used with a Nova73. Start by entering the TCP/IP address of the Nova 73 control system into the <b>External Router 1</b> field. This enables communication via the MNOPL protocol. <b>External Router 2</b> should be used if there is a redundant connection to the Nova 73. Then enter the number of the Nova73 mapping table into the <b>Map</b> field (from 1 to 16).
MNOPL Server	Tick this option to enable the remote MNOPL server when interfacing to a z4 system.
LS Doublestar	This is a project-specific feature.
Surface over TCP	Tick this option to enable "surface" messages to be transmitted via Ethernet (KS-ETH). This affects the transmission of "surface" messages to/from key panels using the firmware KS16. It can be used to prevent CAN bus buffer overflows.



### 3.20.19 Parameter = Alarm

### "System -> Definition -> Parameter = Alarm"

This branch of the 'Tree Definition' defines the options for the Global Alarm.

Select "System -> Definition" in 'Tree Definition' and the Alarm tab to access the options:

C	A	Tree	edefinition: /System	/ Definiti	on				×
	Name	Value	Audio Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+ R
	Audio Input		Parameter	Alarm					
	Audio Out Only		T 1 101		1				
₽	Audio Output Balance Control		Temp. Level Ok	67					
- N	Conf Bus		Temp. Level Max	71					
	Connect				-				
L V	Element State		DB Alarm Act 1						
Þ	EmBER +		DD Aldriff ACU 1					_	
1	GP Sum		DB Alarm Act 2						
⊳	GPI/O		DB Alarm Act 3						
	GPI/O Network		DB Alarm Act 4					_	
	Hidden		DB Alarm Act 4					_	
⊳	Label		DB Alarm Act 5						
⊳	Level Control		DB Alarm Act 6						
⊳	Logic							_	
	MF Key		DB Alarm Act 7						
⊳	Minimix		DB Alarm Act 8						
	Panel		DB Alarm Act 9					_	
L	Ravenna Input		DB Alarm Act 9						
	Source		DB Alarm Act 10						
	Sum Bus		DB Alarm Act 11						
	Surface							_	
1	System ▷ Definition		DB Alarm Act 12						
	<ul> <li>Definition</li> <li>MADI Card Slot 8</li> </ul>		DB Alarm Act 13						
Þ	Vis Chan		DB Alarm Act 14					_	
1	Via Criditi		DB Alarm Act 14						

Parameter	Alarm – reference name for the element.
Alarm Contact	This field is supported by DALLIS only. It assigns a control signal to activate the <b>Global Alarm</b> contact. Note that when this signal is active, no other error need be active to trigger the alarm.
Temp Level OK	The value entered here sets the temperature in ° C at which the Global Alarm is reset after it has been active.
Temp Level Max	The value entered here sets the temperature in ° C at which the Global Alarm will be activated. Note that the maximum temperature varies depending on the product. If you attempt to enter a value outside of the permitted temperature range, then the entry box turns red.
DB Alarm Act x	These fields can be used to display the alarm states (active and inactive) of an external Alarm Log Server.

The following control outputs appear in the "Logic -> Definition -> Parameter Alarm" branch of the 'Tree Selection' window:

Pwr Supply OK	Active when the power supply is operating correctly.
Pwr Supply Failed	Active when the power supply has failed.
Temperature OK	Active when the temperature is below the value set under <b>Temp Level OK</b> in the 'Tree Definition'.
	Active when the temperature exceeds either the value set under <b>Max Temp Level</b> in the 'Tree Definition', or the critical system temperature.





### 3.20.20 Protools

The Mackie-HUI<sup>™</sup> protocol offers many central control functions such as transport control, automation modes, etc. These can be assigned to MF Keys or other control signals. Please see <u>MACKIE HUI Parameters</u> for a full list of elements and their assignable functions.

### Assigning DAW Parameters

#### "System -> Definition -> Protools"

Each function is listed as a separate element within the "System -> Definition" branch of the 'Tree Definition'. To assign a function to an MF Key:

- 1. Start by selecting "System -> Definition" in 'Tree Definition' and the Protools tab.
- 2. Select the function you wish to configure for example, ProTools = V Pot Assign:

Name	Value	Audio L	.ogic Mad	OAC	TCP	Alarm	Extension	Protoc	ols N	latrix	EmBER+	Project	
> * Visualisation		Protools	N/ D	ot Assign			_						
Matrix Control Module 2 (Adr. 2)		Protoois	VER	JT ASSIGN									
> Matrix 128*128 Control Module :	3 (Adr. 3)	Input											
Screen Src Assign Module 14 (Ad	dr. E)	Output											
MF Key													
Minimix		Pan											
Panel		Send A											
Source													
Sum Bus		Send B											
Surface		Send C											
System		and the second											
✓ Definition		Send D											
> Parameter	Aux	Send E											
> Audio	Internal	Seria											
> Parameter	Settings												
> Parameter	Sync	Protools	Glob	al									
> Parameter	Madi	Column			_								
> Parameter	Meter	Color scheme	e deta	BUIT	•								
> Parameter	Fader	Channel <											
> Parameter	Snapshot	d l											
> Parameter	OnAirControl	Channel >											
> Parameter	TCP Link	Bank <											
> Parameter	Timer	_											
> Parameter	Screen	Bank >											
> Parameter	Insert	Assign											
	Alarm												
> Parameter		Default											
> Parameter	TieLine Stereo	Suspend											
> Parameter	Signal Present	2010/02/2011											
> Parameter	Surround Downmix (db)	Flip											
> Parameter	Logic Snapshot	Mute											
> Parameter	ElementState Snapshot												
> Parameter	PFL Mode	Bypass											
> Parameter	PowerUp	Rec/Rdy											
> Parameter	Extension Menu Ctrl												
> Parameter	Central Menu												
> Parameter	Aux Bus Menu	Protools	Aut	o Enable									
> Parameter	VCA Group Menu	Plug-In											
> Parameter	Mic AutoGain												
Protools	V-Pot Assign	Pan											
> Protools	Global	Fader											
> Protools	Auto Enable	and the second											
Protools	Auto Mode	Send Mute											
> Protools	Window	Send											
> Protools	Keyb. Shortcuts												
> Protools	Functionkeys	Mute											
> Protools	Status/Group												
> Protools	Edit	Protools	A+	o Mode									
> Protools	Transport		Aut	o Houe									
> Parameter	Matrix Snapshot	Trim											
> Parameter	Matrix EmBER +	Latch											
> Parameter	Local Consumers												
> Parameter	Local Providers	Read											
> Parameter	Description	Off											
> DB Alarm Act 1		OII											
> DB Alarm Act 2		Write											

3. Double-click in a parameter box to assign the MF Key.

The corresponding control output can be found under the "Logic" branch of the 'Tree Selection' window. This can be used to light the MF Key.



### 3.20.21 Parameter = Local Consumers

#### "System -> Definition -> Parameter = Local Consumers"

An Ember+ Consumer can control, or respond to, parameters published by an Ember+ providing device.

Up to 15 Ember+ consumers can be defined in the "System -> Definition -> Parameter = Local Consumers" branch of the 'Tree Definition' window. The Consumer number (1 to 15) will be referenced by other elements. For example, from an <u>Ember+ GPIO</u>.

# Select "System -> Definition" in 'Tree Definition' and the Ember+ tab to access the "Local Consumers" options:

OA			Treedefinitio	on: / System /	/ Definit	ion							×	
Name	Value	Audio Log	ic Madi OAC	Serial	тср	Alarm	EmBER+	Rave	nna	Project	AccessG	rp 1	Matrix	AccGrp :
> Audio Input		Parameter		Local Consu	mers									
> Audio Out Only		Consumer 01	Remote IP Address	127.0.0.1		Remote Port	Number	9001		Task	Priorities n	ormal	-	
> Audio Output		Consumer 02	Remote IP Address	127.0.0.1		Remote Port	Number	0003		Tack	Priorities n	ormal	-	
Balance Control		Consumer 02				1	-	9002					•	
> Conf Bus > Connect		Consumer 03	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
Element State		Consumer 04	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
EmBER+		Consumer 05	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
EmBER+ A-stage		Consumer 06	Remote IP Address	;		Remote Port	Number			Task	Priorities n	ormal	•	
GP Sum > GPI/O		Consumer 07	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
GPI/O Network		Consumer 08	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
Hidden		Consumer 09	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
> Label		Consumer 10	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	-	
> Level Control								_						
> Logic		Consumer 11	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
MF Key		Consumer 12	Remote IP Address	1		Remote Port	Number			Task	Priorities n	ormal	-	
> Minimix Panel		Consumer 13	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	•	
Ravenna Input		Consumer 14	Remote IP Address	;		Remote Port	Number			Task	Priorities n	ormal	-	
Source		Consumer 15	Remote IP Address			Remote Port	Number			Task	Priorities n	ormal	-	
> Sum Bus						]								
> Surface						1								
<ul> <li>System</li> </ul>		Parameter		Local Provid	ers	]								
> Definition		Provider 1	Local Port Number	9001		Task I	Priorities	normal 🔻	Enable	e Subscript	t Reports 🗹			
> MADI Card Slot 8		Provider 2	Local Port Number	9002		Task	Priorities	normal 🔻	Enable	Subscript	t Reports 🔽	-		
> Vis Chan											t Reports 🔽			
		Provider 3	Local Port Number	9003		l ask l	riorities	normal 🔻	Enable	Subscript	t Reports			

Parameter	Local Consumers – reference name for the element.
Remote IP Address	Enter the TCP/IP Address of the Ember+ providing device. You can enter either "127.0.0.1" or "localhost" to configure the local host.
Remote Port Number	<ul> <li>Enter a port number. This must match the Port Number of the Ember+ provider:</li> <li>If the provider is configured using the ON-AIR Designer, then enter the Local Port Number defined in the provider's configuration.</li> <li>If the providing device is another system type (A_stage, V_pro8, Orban, etc.), then you will need to find out the Ember+ control port number from the relevant documentation.</li> </ul>
Task Priorities	This option can be used to raise the priority of the Ember+ Provider, when compared to DMS and network communications (such as GNET). The default setting of <b>normal</b> is recommended, as changing the priorities may affect the overall system performance. The options are:
	<ul> <li>normal = the Ember+ provider has low priority. Interference of different functions is minimal. When executed, Ember+ functions may be delayed.</li> <li>high = the Ember+ provider is prioritised above DMS. Ember+ functions are executed faster. There may be delays to DMS functions like VisTool metering updates or VisTool control.</li> </ul>
	<ul> <li>highest = the Ember+ provider is prioritised above DMS and TCP/IP link communication: AIF, KPF, GNET, etc. In addition to the effects described above (for high), the setting of crosspoints via GNET may be delayed.</li> </ul>



### **3.20.22 Parameter = Local Providers**

#### "System -> Definition -> Parameter = Local Providers"

An Ember+ Provider publishes parameters so that they may be controlled by an external consuming device.

Up to five Ember+ providers can be defined in the "System -> Definition -> Parameter = Local Providers" branch of the 'Tree Definition' window. The Provider number (1 to 5) will be referenced by other elements. For example, from an <u>Ember+ GPIO</u> or Source element. This allows you to change what can be accessed from each external device.

Select "System -> Definition" in 'Tree Definition' and the Ember+ tab to access the "Local Providers" options:

OA	Treedefinition: / System / Definition				×									
Name	Value	Audio	Logic	Madi	OAC	Serial	тср	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1	
> Audio Input														~
> Audio Out Only		Parameter				Local Provid	ers							
> Audio Output		Provider 1		al Port N		9001		Teel		rmal 🔻 Ena	his Culturation			
Conf Bus														
Connect		Provider 2		al Port N		9002				rmal 🔻 Ena				
EmBER+		Provider 3	Loc	al Port N	lumber	9003		Task	Priorities no	rmal 🔻 Ena	able Subscript	t Reports 🗹		
EmBER+ A-stage		Provider 4	Loc	al Port N	lumber	9004		Task	Priorities no	rmal 🔻 Ena	able Subscript	t Reports 🗹		
GP Sum		Provider 5	Loc	al Port N	lumber	9005		Task	Priorities no	rmal 🔻 Ena	able Subscript	t Reports 🗹		
> GPI/O														
GPI/O Network		Parameter				Provider Clie	nte Whi							
> Label > Level Control		Client 01				192.168.101								
							.111							
Logic MF Key		Client 02				ruby-112								
Minimix		Client 03	IP Addre	SS										
Source		Client 04	IP Addre	SS										
> Sum Bus		Client 05	IP Addre	ss										
> Surface		Client 06	IP Addre	99										
✓ System			IP Addre			<u> </u>								
> Definition			IP Addre											
			IP Addre											
		Client 10	IP Addre	SS										
		Client 11	IP Addre	SS										
		Client 12	IP Addre	SS										
		Client 13	IP Addre	ss										
		Client 14	IP Addre	ss										
		Client 15	IP Addre	99										
		Client 16												
		Cheffe 10	IF Addres	55										
		Parameter				Matrix								
							_							
		Internal Ma		Local Pro	ovider Ni		•							
		EmBER+ N	ame			System Mat	rix							
		Parameter				Settings								
		Sources/Su	ums Namir	ng		by LCD Text	/ Ali 🔻							$\sim$

Parameter	Local Providers – reference name for the element.
Local Port Number	<ul> <li>Enter a port number. This must match the Port Number of the Ember+ consumer:</li> <li>If the consumer is configured using the ON-AIR Designer, then enter the <u>Remote Port</u> <u>Number</u> defined in the consumer's configuration.</li> <li>If the consuming device is another system type (V_pro8, Orban, etc.), then you will need to find out the Ember+ control port number from the relevant documentation.</li> </ul>
Task Priorities	<ul> <li>This option can be used to raise the priority of the Ember+ Provider, when compared to DMS and network communications (such as GNET). The default setting of normal is recommended, as changing the priorities may affect the overall system performance. The options are:</li> <li>normal = the Ember+ provider has low priority. Interference of different functions is minimal. When executed, Ember+ functions may be delayed.</li> <li>high = the Ember+ provider is prioritised above DMS. Ember+ functions are executed faster. There may be delays to DMS functions like VisTool metering updates or VisTool control.</li> <li>highest = the Ember+ provider is prioritised above DMS and TCP/IP link communication: AIF, KPF, GNET, etc. In addition to the effects described above (for high), the setting of crosspoints via GNET may be delayed.</li> </ul>
Enable Subscript Reports	This option determines whether the Ember+ Provider will announce value changes to connected consumers. When ticked, values are announced (required for bi-idirectional <u>Ember+ Source Replication</u> ). When not ticked, values are not announced; this can be used to reduce the volume of network traffic.



In addition, the following options affect all Ember+ providers.

#### **Available for All Products**

Parameter	Matrix – reference name for the element.
Internal Matrix	This field is used to publish the device's internal matrix to an Ember+ provider - enter the provider number from 1 to 5, or select None if you do not wish to publish the matrix.
Ember+ Name	The matrix name appears in the Ember+ tree. It is good idea to edit the name if you are publishing matrices from multiple devices.

### **Available for Power Core**

Parameter	Providers Client Whitelist – reference name for the element.						
Client xx IP Address	This list can be used to restrict the access to the Ember+ providers so that only devices with a defined IP can talk to Power Core (via Ember+). Up to 16 IP addresses (or host names) can be configured. If at least one IP address / host name is entered, then the whitelist becomes active. If all fields are empty, then the whitelist is disabled and access is permitted from consumers with any IP address.						
	For convenience, the whitelist can be temporarily disabled from the Power Core Web UI (via the System -> Control tab).						
Parameter	Settings – reference name for the element.						
Sources/Sums Naming	This option determines whether sources are published using their <b>Display</b> name (System name) or <b>Alias</b> name. In either case, the name must be unique to ensure correct operation.						

# 3.20.23 Parameter = Stream Announcement, PTP Settings, etc.

Please see Global RAVENNA Settings.

# 3.20.24 Parameter = Description

#### "System -> Definition -> Parameter = Description"

This branch of the 'Tree Definition' allows you to define text fields which are displayed in the Web UI (to describe the project and system).

Parameter	Description - reference name for the element.
Project Name	Free text (up to 21 characters).
Version	Free text (up to 21 characters).
Project Description 1 to 4	Free text (up to 21 characters).

## 3.20.25 Parameter = Settings 1

See Parameter = Settings.

#### 3.20.26 Parameter = Faders 1

See <u>Parameter = Faders</u>.



### **3.20.27 Parameter = Snapshots**

#### "System -> Definition -> Parameter = Snapshots"

This branch of the 'Tree Definition' configures the global options for snapshots. The same parameters are repeated four times in a Power Core Max system (to allow a different configuration for each Access Group).

Select "System -> Definition" in 'Tree Definition' and the AccessGrp tab. Scroll down to access the "Parameter = Snapshots" options:

OA		Tre	Treedefinition: / System / Definition							×			
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
> Audio Input													
> Audio Out Only		Paramete			Snapsho	ts 1					· · · · ·		
> Audio Output		Load: ma	x. Fader No	).									
Conf Bus		Load Audi	o always										
> Connect		Enable Lo	ad Groups	logic	E								
> EmBER+		Load Sna		9				Save Sna	achot 1				
EmBER+ A_Line													
> GP Sum		Load Sna	pshot 2					Save Sna	pshot 2				
> GPI/O		Load Sna	oshot 3					Save Sna	pshot 3				
> GPI/O Network		Load Sna	oshot 4					Save Sna	oshot 4				
> Label		Load Sna	nshot 5					Save Sna	ashot 5				
> Level Control													
> Logic		Load Src	1 C C					Save Src Cli	pboard				
> MF Key		Delete Sr	c Clipboard										
> Minimix		Reset Cha	nnel Paran	neters									
> N-1		Unlock Sa	ve						Enable				
> Source		Unlock Lo							Enable		<b>/</b>		
> Sum Bus		UNIOCK LO	au						cildule j				
> Surface													
✓ System		Paramete	r		Logic Sn	apshots 1							
> Definition		State 1											
> MADI Card Slot 8		State 2											
> Vis Chan		State 3											
		I STATE 3											

Parameter	Snapshots – reference name for the element.
Load max. Fader No.	Enter the maximum fader number which will be reset by a snapshot load. Any fader above this number will not be affected. Leave the field blank to apply snapshot loads to all faders. This option applies to both the internal snapshot memories and VisTool snapshots.
Load Audio always	If ticked, audio-related parameters are loaded for all faders regardless of the <b>Load max. Fader No</b> . You can use this option to load audio-related parameters to all faders, while loading fader strip assignments up to the <b>Load max. Fader No</b> . Audio-related parameters include User Labels, DSP Settings, Fader level (if <u>Production Mode</u> is enabled) and Bus assignments. This option applies to both the internal snapshot memories and VisTool snapshots.
Enable Load Groups Logic	Available when the System Core = <b>Power Core</b> . If ticked, a number of additional logic inputs become available - <b>FC: Disable</b> and <b>FO: Enable</b> The inputs can be used to change which source parameters load depending on the fader status. See <u>Selective Loading of Source Parameters</u> . If unticked, the default behaviour applies: all parameters load if source faders are closed, and do not load if source faders are open. This option applies to both the internal snapshot memories and VisTool snapshots.
Load Snapshot 1 to 5	Assigns input control signals which will load internal snapshot memories 1 to 5 when supplied with a rising edge. For example, you may wish to program an MF Key which will 'zero' the desk from the press of a button.
Save Snapshot 1 to 5	Assigns input control signals which will save internal snapshot memories 1 to 5 when supplied with a rising edge.
Load Src Clipboard	When activated, this control signal loads DSP parameters in the internal clipboard to the source "in access".
Save Src Clipboard	When activated, this control signal saves DSP parameters from the source "in access" to the internal clipboard.
Delete Src Clipboard	When activated, this control signal clears the internal clipboard.



Reset Channel Parameters	When activated, this control signal resets DSP parameters for the source "in access" to their default values.
	Use these options to protect the SAVE and LOAD buttons on the Central Module. When nothing is assigned, or the <b>Enable</b> box is unticked, the function is always available to the operator. To protect the function, assign an input control signal and tick the <b>Enable</b> checkbox.

The following control outputs appear in the 'Tree Selection' window under "Logic -> Definition -> Parameter = Snapshots":

	Active when data is stored to the internal snapshot memory. This can be used to signal to the operator which memories contain settings and which memories are empty.
Snapx.load	This output is pulsed when the snapshot is loaded.
Src Clipboard.set	Active when data is stored to the internal clipboard.
Glb Snap loaded pulse	This output is pulsed when a <b>Full</b> snapshot is loaded.
Src Snap loaded pulse	This output is pulsed when a <b>Src</b> snapshot is loaded.

# 3.20.28 Parameter = Logic Snapshots

#### "System -> Definition -> Parameter = Logic Snapshots"

This branch of the 'Tree Definition' can be used to save and recall up to 32 logical states with every snapshot. The same parameters are repeated four times in a Power Core Max system (to allow a different configuration for each Access Group).

Select "System -> Definition" in 'Tree Definition' and the AccessGrp tab. Scroll down to access the "Parameter = Logic Snapshots" options:

AO	Treedefinition: / System / Definition								×				
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
Audio Input					[						<u>.</u>		
Audio Out Only		Parameter	r		Logic Sn	apshots 1							
Audio Output		State 1											
Balance Control													
Conf Bus		State 2											
Connect		State 3											
Element State		State 4											
EmBER+		State 4											
GP Sum		State 5											
▷ GPI/O		State 6											
GPI/O Network		State 6											
Hidden		State 7											
Label		State 8											
Level Control													
Logic		State 9											
MF Key		State 10											
Minimix													
Panel		State 11											
Ravenna Input		State 12											
Source													
Sum Bus		State 13											
Surface		State 14											
▲ System													
Definition		State 15											
MADI Card Slot 8		State 16											
Vis Chan													
		State 17											
		State 18											
		:											

Parameter	Logical Snapshots – reference name for the element.
State 1	Enter the first logical state you wish to save.
State 2	Enter the second logical state you wish to save.
etc.	Continue as above. You can enter up to 32 logical states.



## **3.20.29 Parameter = Element States Snapshots**

#### "System -> Definition -> Parameter = Element State Snapshots"

This branch of the 'Tree Definition' can be used to save and recall up to eight element states with every snapshot. The same parameters are repeated four times in a Power Core Max system (to allow a different configuration for each Access Group).

Elements which support this functionality include the <u>Connect -> TConn64</u>, <u>Logic -> Button16</u> and <u>Logic -> Button64</u>.

Select "System -> Definition" in 'Tree Definition' and the AccessGrp tab. Scroll down to access the "Parameter = Element States Snapshot" options.

OA		Treedefinition: / System / Definition							×					
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1	
<ul> <li>Audio Input</li> <li>Audio Out Only</li> </ul>		Paramete			Flement	States Sn	anshot 1						L	
Audio Output		Element S			Cicilicite	States on								
Balance Control ▷ Conf Bus		Element S												
Connect		Element S	tate 3											
Element State ▷ EmBER+		Element S	itate 4											
GP Sum GPI/O		Element S	tate 5											
GPI/O Network		Element S	tate 6											
Hidden Label		Element S												
<ul> <li>Level Control</li> <li>Logic</li> </ul>		Element S												
MF Key		Element S												
Minimix Panel		Element S												
Ravenna Input		Element S	tate 12											
<ul> <li>Source</li> <li>Sum Bus</li> </ul>		Element S	tate 13											
<ul> <li>Surface</li> <li>System</li> </ul>		Element S	tate 14											
Definition		Element S	tate 15											
<ul> <li>MADI Card Slot 8</li> <li>Vis Chan</li> </ul>		Element S	tate 16											

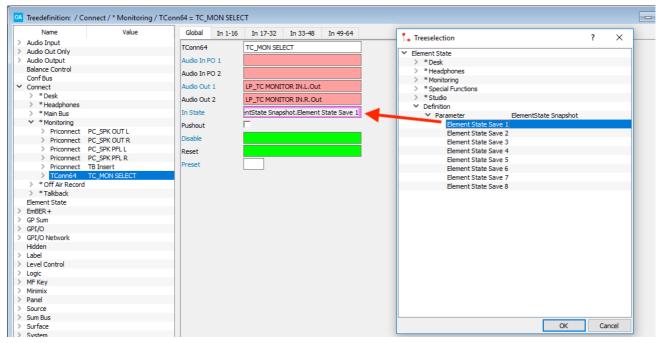
Parameter	Element States Snapshot – reference name for the element.
Element State 1	Enter the first element <b>Out State</b> you wish to save.
Element State 2	Enter the second element <b>Out State</b> you wish to save.
etc.	Continue as above. You can enter up to 8 element <b>Out States</b> .

To determine which elements will be saved, enter the element's **Out State** control signal into the **Element State** field as shown below:

State 22							
State 23		I F	Treese	lection		?	×
State 24		~	' Element	t State			
State 25			✓ *D				
State 26				Button 16	GPIO-Button		
State 27			*	Button 16	MON PRE-SELECT		
			>	TConn64	MON MAIN CLfe		
State 28				TConn64	MON MAIN LR		
State 29				TConn64	MON MAIN LfRf		
State 30				TConn64	MON MAIN LsRs		
State 31				eadphones Ionitoring			
				pecial Function	s		
State 32				tudio			
			> Def	inition			
Parameter	ElementState Snapshot						
Element State 1	MON PRE-SELECT.Out State						
Element State 2							
Element State 3							
Element State 4							
Element State 5							
Element State 6							
Element State 7							
Element State 8							



Then enter the corresponding **Element State Save** control signal into an element's **In State** field to define the element for snapshot recall. In our example, the **Out State** from the Button16 will switch the **In State** of a TConn64 element:





# 3.20.30 Parameter = Central Menu

#### "System -> Definition -> Parameter = Central Menu"

This branch provides external control of the Central Module's DSP pages: INP, DYN, EQ, etc.

Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenr	a Project	AccessGrp 1
Audio Input												
Audio Out Only									1			
Audio Output		Paramete	er		Central	Menu 1						
Conf Bus		ACCESS/	ACCESS/ASSIGN Reset									
Connect												
EmBER+									1			
GP Sum		Paramete	er		Bus Me	nu 1						
GPI/O		Select Me	enu Page	1								
GPI/O Network		Colorta										
Label		Select Me	Select Menu Page 2									
Level Control		Select Me	Select Menu Page 3									
> Logic		E oloct Ma	enu Page ·	4					i			
MF Key			-									
Minimix		Select Me	enu Page	5								
Source		Reset										
Sum Bus		- Coct										
Surface									-			
System		Paramete	er		VCA Gr	oup Menu	1					
Definition		Select Me	enu Page	1								
MADI Card Slot 8			-									
Vis Chan		Select Me	enu Page 1	2								

Parameter	Central Menu – reference name for the element.
	Assign an input control signal to reset any active <b>ACCESS</b> buttons to off. This will cancel any open menus: INP, DYN, EQ, etc.

The following control outputs appear in the 'Tree Selection'. They can be used to signal when a menu or state is active.

- Treese	ection			? X
EmBER	+			
GPI/O				
4 Logic				
▷ *	licrophone Sources			
⊿ De	finition			
⊳	Audio	Internal		
⊳	Parameter	Alarm		
$\triangleright$	Parameter	Aux		
⊳	Parameter	Bus Menu 1		
4	Parameter	Central Menu 1		
	No Menu active			
	INP Menu active			
	DYN Menu active			
	LIM Menu active			
	DLY Menu active			
	EQ Menu active			
	BUS Menu active			
	INS Menu active			
	SYS Menu active			
	ASSIGN active			
	ACCESS active			
	Parameter			
		Faders		
Þ	Parameter	Faders 1		
			ок	Cancel

During a fader strip assignment a source may be in access. Thus, it is possible for both the ACCESS active and ASSIGN active outputs to be true at the same time.



## 3.20.31 Parameter = Bus Menu

#### "System -> Definition -> Parameter = Bus Menu"

This branch provides external control of the BUS assign pages 1 to 5 (known as the Aux Bus menus).

Parameter         Bus Menu – reference name for the element.					
Select Menu Page n	Assign an input control signal to select an aux bus menu.				
Reset	Assign an input control signal to reset (cancel out of) the aux bus menus.				

The corresponding control outputs appear in the 'Tree Selection'. They can be used to signal when a menu is active.

# 3.20.32 Parameter = VCA Group Menu

"System -> Definition -> Parameter = VCA Group Menu"

This branch provides external control of the VCA Group assign pages 1 and 2.

Parameter	VCA Group Menu – reference name for the element.
Select Menu Page n	Assign an input control signal to select VCA Group assign page n.

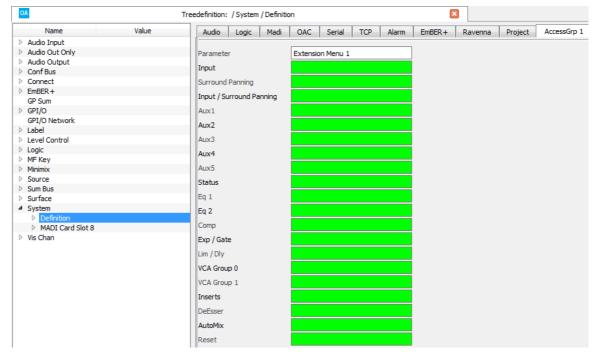
The corresponding control outputs appear in the 'Tree Selection'. They can be used to signal when a menu is active.



# 3.20.33 Parameter = Extension Menu

#### "System -> Definition -> Parameter = Extension Menu"

This branch of the 'Tree Definition' provides external control of the page buttons on a Key Extension panel (optional on **sapphire** and **ruby**).



Parameter Extension Menu – reference name for the element.					
Menu	Assign an input control signal to select a page: Input, Surround Panning, etc.				
Reset	Assign an input control signal to reset (cancel) the Key Extension page.				

An "Out" control signal for each menu appears in the 'Tree Selection'. They can be used to signal when a menu is active.



# 3.20.34 Parameter = Matrix Snapshot

#### "System -> Definition -> Parameter = Matrix Snapshot"

This branch of the 'Tree Definition' can be used to save and load up to 128 matrix connections with every snapshot. The same parameters are repeated four times in a Power Core Max system (to allow snapshots to be handled separately for each Access Group).

Each channel of a stereo or multi-channel output has to be defined individually.

Start by selecting "System -> Definition" in 'Tree Definition' and the Matrix AccGrp tab. Scroll down to access the "Parameter = Matrix Snapshot" options

AO	Treedefinition: / System / Definition															
Name	Value	Audio	Madi	OAC Serial TCP Alarm		m i	EmBER+		venna	Project		AccessGrp 1	1 Matrix AccGrp 1			
Audio Input		Parameter		Matrix	Matrix Snapshot 1											
Audio Out Only						-										
Audio Output		Entries 1.	.8	0					0	0	0	0	0	0	0	
Balance Control		Entries 9.	16	0	]			[	0	0	0	0	0	0	0	
Conf Bus					] ]			l						1		
Connect		Entries 17	24	0					0	0	0	0	0	0	0	
Element State		Entries 25	32	0	]				0	0	0	0	0	0	0	
EmBER+					]			ľ								
GP Sum		Entries 33	40	0					0	0	0	0	0	0	0	
GPI/O		Entries 41	48	0					0	0	0	0	0	0	0	
GPI/O Network					1			ĺ			-					
Hidden		Entries 49	56	0	]			ļ	0	0	0	0	0	0		
Label		Entries 57	64	0					0	0	0	0	0	0	0	
Level Control		Entries 65	70	0	]			ĺ	0	0	0	0	0	10		
Logic		Entries 65	/2	<u> </u>	]			ļ	U	<u> </u>	<u> </u>	<u> </u>				
MF Key		Entries 73	80	0					0	0	0	0	0	0	0	
Minimix		Entries 81	00	0	ĺ			ĺ	0	0	0	0	0	10		
Panel		Enules of	00	<u> </u>	]			ļ	•	Ľ	Ľ_	Ľ		l –		
Ravenna Input		Entries 89	96	0					0	0	0	0	0	0	0	
Source		Entries 97	104	0	j			j	0	0	0	0	0	0	0	
Sum Bus					1			l						1		
Surface		Entries 10	5112	0					0	0	0	0	0	0	0	
▲ System		Entries 11	3., 120	0	1			[	0	0	0	0	0	0	0	
Definition					]			l		H		-				
MADI Card Slot 8		Entries 12	1128	0					0	0	0	0	0	0	0	
Vis Chan																

Parameter         Matrix Snapshot 1 – reference name for the element.					
Entries 18	Enter the matrix numbers for the first 8 outputs whose connections you wish to save.				
etc.	Continue as above. You can define up to 128 matrix connections.				





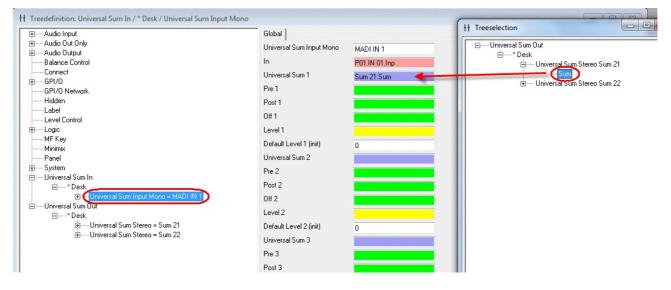
# 3.21 Universal Sums

The Universal Sum In and Universal Sum Out elements can be used to sum signals within a Nova29 system.

# 3.21.1 Universal Sum In

Up to 128 mono (or 64 stereo) Universal Sum Ins may be defined, each with its own audio input. Each **Universal Sum In** is then routed to any or all **Universal Sum Outs** (up to a maximum of 7, mono or stereo, at a time). Control signals can be configured to provide on/off, pre/post and variable level control for each summing point.

First, insert and name the elements in the usual manner. Then define the summing parameters from the 'Tree Definition'.



Universal Sum Input	Reference name for the element.
In	Selects the audio input for the Universal Sum In.
Universal Sum 1	Assigns the input to a summing output. You can choose any named <u>Universal Sum Out</u> (mono or stereo) element. Note: if you have not named your <b>Universal Sum Out</b> , then you will not see it as an option in the 'Treeselection'.
Pre 1	Assigns a control signal to switch the summing input send to pre VCA level.
Post 1	Assigns a control signal to switch the summing input send to post VCA level.
Off 1	Assigns a control signal to switch the summing input send to off.
Level 1	Assigns a level control to adjust the summing input send level.
Default Level 1 (init)	This level is applied when nothing is assigned to the Level x function.
etc.	The Universal Sum, Pre, Post, Off, Level and Default Level parameters are repeated seven times, allowing you to assign each Universal Sum In to up to 7 Universal Sum Outs.



# 3.21.2 Universal Sum Out

Up to 14 mono or 7 stereo Universal Sum Outs may be defined. Each **Universal Sum In** can then route to a maximum of 7 **Universal Sum Outs** (mono or stereo) at a time.

This branch of the 'Tree Definition' names the Universal Sum Out elements.

Audio Input	General	
<ul> <li>← Audio Dut Duly</li> <li>← Audio Dutput</li> <li>← Balance Control</li> <li>← Connect</li> <li>● GPI/0 Network</li> <li>← Hidden</li> <li>← Label</li> <li>← Level Control</li> <li>● Logic</li> <li>← MF Key</li> <li>← Minimix</li> <li>← Panel</li> <li>● System</li> <li>● Universal Sum In</li> <li>● Universal Sum Stereo = Sum 21</li> <li>● Universal Sum Stereo = Sum 22</li> </ul>	Universal Sum Stereo	Sum 21
iversal Sum Out Reference name for the eleme	nt.	





# 3.22 VisChan

The "<u>Vis Chan</u>" branch of the ON-AIR Designer's 'Tree Definition' names the physical controls on Fader/Channel Modules so that they can be mapped to VisTool elements. This allows physical MF Keys and displays such as signal present to be mirrored on a VisTool runtime GUI.

You must enter a unique reference name for each control you wish to access. Then save the configuration, and link it to VisTool Editor (using the Project Properties). Within VisTool Editor, you will find all named functions under the corresponding drop-down menus when you define an element's function - for example, named MF Keys appear under the **MF Key** branch when defining a VisTool Button or Box element.

The following controls can be named in the 'Tree Definition'. Note that you will need to repeat the procedure for each Fader/Channel Module you wish to access.

#### VisChan Parameters

Treedefinition: / Vis Chan / Fader Module (full	) 955/10 01 (Adr. 01)	1									
Name         > Audio Input         > Audio Out Only         > Audio Output         Balance Control         Connect         Element State         > EmBER +         > GP Sum         > GPI/O         > Mininix         > Panel         V Source         V * #AES Sources         > Source Stereo         > Souroures         > * Hybrids </th <th>955/10 01 (Adr. 01) Value SRC_AES SRC_AES SRC_AES SRC_AES SRC_AES SRC_AES SRC_AES</th> <th>Source MF 1.1a MF 1.1b MF 1.2a MF 1.2b MF 1.3 MF 1.4 MF 1.5 SigP 1 Access 1 Access 1 Access 1 LayerSelec LCD-Text 1 Label 1.1 Label 1.2 MicGain 1 BackGain 1</th> <th>t 1</th> <th>t Module Fader 1MF 1a Fader 1MF 2b Fader 1LAWO</th> <th>PFL1Swap</th> <th>Channel Mapping</th> <th>Snapshots</th> <th>MF Key Mapping</th> <th>VisChan1</th> <th>VisChan2</th> <th>VisChan3</th>	955/10 01 (Adr. 01) Value SRC_AES SRC_AES SRC_AES SRC_AES SRC_AES SRC_AES SRC_AES	Source MF 1.1a MF 1.1b MF 1.2a MF 1.2b MF 1.3 MF 1.4 MF 1.5 SigP 1 Access 1 Access 1 Access 1 LayerSelec LCD-Text 1 Label 1.1 Label 1.2 MicGain 1 BackGain 1	t 1	t Module Fader 1MF 1a Fader 1MF 2b Fader 1LAWO	PFL1Swap	Channel Mapping	Snapshots	MF Key Mapping	VisChan1	VisChan2	VisChan3
<ul> <li>Surface</li> <li>System</li> <li>Vis Chan</li> <li>Fader Module (full) 955/10 01 (Adr. 01)</li> <li>Fader Module (full) 955/10 02 (Adr. 02)</li> </ul>											
MF 1.1a, MF 1.1b, etc.	Reference	name f	or Fad	er 1 MF	Key 1a,	1b, and so	on.				
SigP 1	Reference	name f	or Fad	er 1 Sigi	nal Prese	ent indicato	r.				
Access 1	Reference	name f	or Fad	er 1 AC	CESS ke	y (to put th	e source	into access	s).		
Assign 1	Reference	name f	or Fad	er 1 AC	CESS ke	y (to activa	te fader s	strip assign)	).		
LayerSelect 1	Reference the ACCES						te layer s	witching an	d provic	le acces	ss to
LCD-Text 1	Reference	name f	or Fad	er 1 Dis	olay Nam	ne.					
Label 1.1	Reference	name f	or Fad	er 1 Use	er Label L	ine 1.					
Label 1.2	Reference	name f	or Fad	er 1 Use	er Label L	ine 2.					
MicGain 1	Reference	name f	or Fad	er 1 mic	gain (an	alog input (	gain).				
Gain 1	Reference	name f	or Fad	er 1 gair	n (channe	el DSP gair	n).				
BackGain 1	Reference	name f	or Fad	er 1 <u>Bac</u>	kGain.						



# 4. Configuring Audio-over-IP

This chapter describes the options for Audio-over-IP.

The RAVENNA setup varies depending on the type of System Core. For **Power Core**, all of the configuration is handled by the ON-AIR Designer. For the **Compact Engine**, two different tools are required: the ON-AIR Designer and RAVENNA Web UI. This document describes the ON-AIR Designer parameters.

All streams are fully compatible with the SMPTE ST2110-30/31, AES67 and RAVENNA standards. To achieve redundant streaming, compatible with SMPTE ST2022-7, you must use both interfaces: primary and secondary.



# 4.1 RAVENNA in Power Core

# 4.1.1 RAVENNA Out

Audio is streamed from **Power Core** to the network according to the RAVENNA audio output settings defined in the system configuration. This means that once a suitable configuration is loaded to the system, audio will be streamed automatically whenever Power Core is connected to the network and powered.

To prepare some output streams, edit the system configuration as follows:

1. Open the "Audio Output" branch of the 'Tree Definition', and select one of the **RAVENNA Out** tabs.

Note that the number of channels available is dependent on the Power Core license. At maximum capacity, up to 256 channels of audio can be broadcast on 128 streams.

Note that streams can be transmitted from either or both front panel ports (ra0 and ra1).

붜 Outputs		Tre	edefinition	×	System (	Core	×	# Treedefinition: / Audio Output / RAVENNA Port 1 / Output 001 = R16:01s.L 🗵
Name	Value	<b>^</b>	RAVENNA I	In 1-64 RAVENN	A Out 1-64 RAVENNA	In 65-128 RAV	ENNA	A Out 65-128
Audio Input			Output 001	R 16:01s.I	Type: Stereo 🔻	Din Offset Gain	n	Matrix enable ON V Transparent Default Audio RAVENNA: Stream Size 2 V Codec L24 SampPerF
<ul> <li>Audio Out Only</li> <li>Audio Output</li> </ul>			Output 002	D46.04-D		Dig Offset Gain	_	Matrix enable ON Transparent Default Audio
Audio Output AES3 I/O Card Slot 2					_			
Definition			Output 003	R16:03s.L	Type: Stereo 🗹	Dig Offset Gain	0	Matrix enable ON 🔻 Transparent 🗌 Default Audio RAVENNA: Stream Size 2 💌 Codec L24 💌 SampPerF
Line Out Card Slot 3			Output 004			Dig Offset Gain	D	Matrix enable ON  Transparent  Default Audio
MADI Card Slot 8			Output 005	R 16:05e I	Type: Stereo	Dig Offset Gain	n	Matrix enable ON  Transparent  Default Audio RAVENNA: Stream Size 2 Codec L24 SampPerF
MADI Port 1					Type: Dereo Ital			
MADI Port 2			Output 006			Dig Offset Gain		Matrix enable ON  Transparent  Default Audio
<ul> <li>MADI Port 3</li> <li>MADI Port 4</li> </ul>			Output 007	R16:07s.L	Type: Stereo 🔽	Dig Offset Gain	0	Matrix enable ON  Transparent  Default Audio RAVENNA: Stream Size 2 Codec L24 SampPerF
A RAVENNA Port 1		1	Output 008	R16:07s.R		Dig Offset Gain	D	Matrix enable ON  Transparent  Default Audio
	16:01s.L		Output 009	R 16:09s I	Type: Stereo 🔻	Dig Offset Gain	n	Matrix enable ON  Transparent Default Audio RAVENNA: Stream Size 2 Codec L24 SampPerF
	16:01s.R				Type: Dures		_	
	16:03s.L		Output 010	R16:09s.R		Dig Offset Gain	_	Matrix enable ON Transparent Default Audio
	16:03s.R	_	Output 011	R16:11s.L	Type: Stereo 🔽	Dig Offset Gain	0	Matrix enable ON  Transparent  Default Audio RAVENNA: Stream Size 2 Codec L24 SampPerF
	16:05s.L 16:05s.R		Output 012	R16:11s.R		Dig Offset Gain	D	Matrix enable ON  Transparent  Default Audio
	16:07s.L		Output 013	D16-12-1	Type: Stereo 🔽	Dig Offset Gain		Matrix enable ON 🔻 Transparent 🗍 Default Audio RAVENNA: Stream Size 2 💌 Codec L24 🔍 SampPerF 🗏
	16:07s.R				Type: Stereo is		_	
	116:09s.L	- 41	Output 014	R16:13s.R		Dig Offset Gain	0	Matrix enable ON  Transparent  Default Audio
	16:09s.R		Output 015	R16:15s.L	Type: Stereo 🔽	Dig Offset Gain	D	Matrix enable ON V Transparent Default Audio RAVENNA: Stream Size 2 V Codec L24 V SampPerF
	16:11s.L		Output 016	R 16:15s.R		Dig Offset Gain	n	Matrix enable ON Transparent Default Audio
	16:11s.R 16:13s.L	- 11			-		-	Matrix enable OFF  Transparent  Default Audio SUM PGM 1.Out.L RAVENNA: Stream Size 2  Codec L24  SampPerF
	16:13s.R		Output 017		Type: Stereo 🔻			
	16:15s.L		Output 018	R16:PGM.R		Dig Offset Gain	0	Matrix enable OFF  Transparent  Default Audio SUM_PGM 1.Out.R
	116:15s.R		Output 019	R 16:REC.L	Type: Stereo 🔽	Dig Offset Gain	D	Matrix enable OFF Transparent Default Audio SUM_REC.Out.L RAVENINA: Stream Size 2 Codec L24 T SampPerF
	16:PGM.L		Output 020	R 16:REC.R		Dig Offset Gain	n	Matrix enable OFF Transparent Default Audio SUM REC.Out.R
	16:PGM.R	_		RIUMEEN				
	16:REC.L		Output 021		Type: Stereo 🗌	Dig Offset Gain	-	Matrix enable OFF Transparent Default Audio RAVENINA: Stream Size 2 Codec L24 SampPerF
	16:REC.R		Output 022			Dig Offset Gain	D	Matrix enable OFF  Transparent  Default Audio
Output 021								

#### 'Tree Definition': Audio Output -> RAVENNA 1-64

2. All outputs that have a name entered into the **Name** field will be transmitted automatically as streams, while the other parameters configure the output's audio options and stream setup.

The first few fields: Name, Type, Dig Offset Gain, Matrix enable, Transparent and Default Audio are handled in an identical manner to other outputs. See <u>MADI IO</u> for details.

The RAVENNA parameters: Stream Size, Codec, SampPerFrm, Devices, IP Addresses, mDNS, SAP, TTL, etc. define the stream setup.

The important fields are:

- Name a name *must* be entered in order to publish the output stream to the network. The maximum length is 8 characters. If the stream is to be displayed on another ruby surface in a channel list, then the stream name must use the format [GroupName]:[SignalName], where each label field is a maximum of 8 characters. See <u>RAVENNA Pool Sources</u> for details.
- Type defines the format of the output: mono, stereo, etc. This should match the Stream Size.
- Matrix enable by turning ON the Matrix Enable option, the output can be controlled by a matrix.
- **Default Audio** alternatively, if **Matrix Enable** is **OFF**, a permanent audio source can be assigned to the output. Note that the **Default Audio** setting is ignored when **Matrix Enable** is **ON**.
- Stream Size defines the number of audio channels used by the stream. This should match the audio output format (Type).
- Codec selects the type of codec used for the stream: Linear 16, 24 or 32 bits; or AM824 (a packetized AES signal that includes all user and status bits).
- **SampPerFrm** sets the number of samples included in each Ethernet Frame. A frame is the payload being carried over the Ethernet link. This is typically set to 32.
- Devices selects which port to send the stream out on: ra0, ra1 or both ra0 + ra1 (Hitless Merge SMTPE 2022-7).



- IP Address 0, 1 enter the multicast address for the streams being transmitted on ra0 and ra1. Note that if this field is left blank, then a default multicast address is assigned. These fields provide your network architect with the ability to implement a specific IP multicast schema for your facility.
- UDP Port No. reserved for Unicast.
- mDNS multicast DNS is a way to enable stream discovery on a Layer 2 network. Up to four mDNS "Announcement Rings" can be established per Power Core. These can be used to shape the stream availability between Power Core and other RAVENNA devices.
- SAP Session Announcement Protocol, is a variant on mDNS and expands the Announcement Ring capability to eight.
- **TTL** Time To Live defines how many hops the stream may navigate. Each time a stream traverses a switch, the TTL is reduced by one.
- Enable / Disable ability via Logic to control whether a stream is to be transmitted or not.

In our example, the network will receive 10 stereo streams (named **R1601s**, **R1603s**, etc): the first 8 are controlled by an external matrix, while the last two have been assigned some **Default Audio** (from the Program and Record sums).

3. Repeat these steps to configure the remaining RAVENNA output streams as needed.

Once the configuration has been transferred to the system, you can use the Web UI RAVENNA -> Inputs page to check the streaming setup.



# 4.1.2 RAVENNA In

Audio from streams on the network can be connected to **Power Core** either statically (by assigning a source from a RAVENNA streaming input) or dynamically (by configuring RAVENNA Pool Sources).

In both cases, you will need to define the streaming inputs as follows:

1. Open the "Audio Input" branch of the 'Tree Definition', and select one of the **RAVENNA In** tabs.

Note that the number of channels available is dependent on the Power Core license. At maximum capacity, up to 256 channels of audio can be received via 128 streams.

Note that streams are received on either or both front panel ports (ra0 and ra1) depending on the external network topology.

밖 c	lutputs	× #	т	reedefinition	ı X		System Core	×	計 Tre	edefinitio	on: / Audio Inpu	it / RAVENNA	Port 1 / Input 001 = PLAY1.L 🔀			
Name		Value	^	RAVENNA	In 1-64 RAVEN	INA Out 1-64 R/	AVENNA In 65-128 RJ	AVENNA Out	t 65-128							
<ul> <li>Audio Input</li> <li>AES3 I/O Card S</li> </ul>				Input 001	PLAY1.L	Type: Ste	reo 🔻 Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	RAVENNA:	Stream Size 2 VDP Port No.	0 Default Stream	R 16PC:PLAY1	Matrix N
DMS 1	slot 2			Input 002	DLAV1 D		Dig Offset Gain	0	riv anabla (	-	Transparent	-				
DMS 1						_	-		5							
DMS 2				Input 003	PLAY2.L	Type: Stereo 🔽	Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	RAVENNA:	Stream Size 2 VDP Port No.	0 Default Stream	n R16PC:PLAY2	Matrix
DMS 4				Input 004			Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	1				
Line In Card Slo	t 1			Input 005	CADTI	Type: Stereo 🗹	Dig Offset Gain	0	riu anabla (	-	Transmerent C	DAVENNA.	Stream Size 2 UDP Port No.	Default Stress	DISDOUCADT	Matrix
MADI Card Slot	8					Type: Stereo IV	-		2		<u>.</u>		Stream Size 2 ODP Port No.	Default Stream	K10PC/CART	Maurix
MADI Port 1				Input 006	CART.R		Dig Offset Gain	0 Mat	rix enable	ON T	Transparent					
MADI Port 2			-	Input 007	RAV1.7/8.L	Type: Stereo	Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	RAVENNA:	Stream Size 2 VDP Port No.	0 Default Stream	n	Matrix
MADI Port 3			-	T	RAV1.7/8.R		Dig Offset Gain	0	riv analyla (	-	Transparent	1				
MADI Port 4									2							
Mic / Line Card S A RAVENNA Port 1				Input 009	AMIX1	Type: Mor	no 🔻 Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	RAVENNA:	Stream Size 8 VDP Port No.	0 Default Stream	CRYPC:AUTOMIX	Matrix
Input 001	PLAY1.L		_	Input 010	AMEX2		Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	1				
Input 002	PLAY1.R			Input 011	AMIV2	Type: Stereo	Dig Offset Gain	0 Mate	riv opabla		Transparent	1				
Input 003	PLAY2.L					Type. Stereo I	-		2		( · _					
Input 004	PLAY2.R			Input 012	AMIX4		Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent					
Input 005	CART.L			Input 013	AMIX5	Type: Stereo	Dig Offset Gain	0 Mate	rix enable	ON 🔻	Transparent	1				
Input 006	CART.R			Input 014	AMIVE	1	Dig Offset Gain	0 Mate	riv anabla		Transparent	1				
Input 007	RAV1.7/8.L						-		-							
Input 008	RAV1.7/8.R AMIX1			Input 015	RAV1.15/16.L	Type: Stereo 🗹	Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent					
<ul> <li>Input 009</li> <li>Input 010</li> </ul>	AMIX1 AMIX2			Input 016			Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	1				
Input 010	AMIX3			Input 017	RAV1.17/18.L	Type: Ste	reo 🔻 Dig Offset Gain	0 Mate	riv enable		Transparent [		Stream Size 2 UDP Port No.	0 Default Stream		Matrix
Input 012	AMIX4					1900.000	-		2		( ·			berdare berdare berdare		HOUR
Input 013	AMIX5			Input 018	RAV1.17/18.R		Dig Offset Gain				Transparent					
Input 014	AMIX6			Input 019	RAV1.19/20.L	Type: Stereo 🗹	Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	RAVENNA:	Stream Size 2 VDP Port No.	0 Default Stream	n	Matrix
Input 015	RAV1.15/16.L			Input 020	RAV1.19/20.R		Dig Offset Gain	0 Matr	rix enable	ON -	Transparent	1				
Input 016	RAV1.15/16.R						-									
Input 017	RAV1.17/18.L			Input 021	RAV1.21/22.L	Type: Stereo 🔽	Dig Offset Gain	0 Mat	rix enable	ON •	Transparent I	RAVENNA:	Stream Size 2 VDP Port No.	0 Default Stream	n	Matrix
Input 018	RAV1.17/18.R			Input 022			Dig Offset Gain	0 Mat	rix enable	ON 🔻	Transparent	1				
Input 019	RAV1.19/20.L															

#### 'Tree Definition': Audio Input -> RAVENNA 1-64

2. All inputs which are named can be used by other elements within the configuration; for example, as the audio input to a source. The other parameters configure the input's audio options and stream setup.

The first few fields: **Name**, **Type**, **Dig Offset Gain**, **Matrix enable** and **Transparent** are handled in an identical manner to other audio inputs. See MADI Signal Parameters for details.

The RAVENNA parameters: Stream Size, UDP Port No, etc. define the stream setup.

The important fields are:

- **Name** a name *must* be entered in order to use the input.
- Type defines the format of the input: mono, stereo, etc. This should match the Stream Size.
- Matrix enable by turning ON the Matrix Enable option, the input can be controlled by a matrix.
- Stream Size defines the number of audio channels used from the stream. This should match the audio input format (Type) to maintain conformity. However, this is not a requirement. If the stream size does not match the type, then the audio inputs will still be assigned when a stream is subscribed to, with consecutive channels being allocated on a one-to-one basis.
- UDP Port No. reserved for Unicast operation.
- Default Stream (optional) defines the name of the stream you wish subscribe to. It can be used to
  permanently link the receiver to a stream. You can enter a stream name of up to 28 characters. The
  console will then search the network using mDNS or SAP announcement protocols. If a matching stream
  name is found, the receiver will automatically subscribe to it. If a Default Stream name is not entered,
  then an automatic subscription will not occur. In this instance, a stream subscription can be established
  by selecting a pool source on the surface, with internal logic or via Ember+.
- Matrix No. when the system is used in conjunction with an external routing controller, such as Matrix Server, this number corresponds to the entry in the Matrix Server configuration.
- 3. Repeat these steps to configure the inputs for each RAVENNA stream.



# 4.1.3 Global RAVENNA Settings

The following branches of the 'Tree Definition' define the global RAVENNA settings.

Start by selecting "System -> Definition" in 'Tree Definition' and the Ravenna tab. Scroll down to access the parameter sets.

# Stream Announcement

"System -> Definition -> Parameter = Stream Announcement"

These parameters define the mDNS and SAP channels used for stream announcement:

- mDNS channels use the multicast Domain Name System defined in IETF RFC 6762.
- SAP channels use the Session Announcement Protocol defined in IETC RFC 2974.

OA					Treedefi	nition: / Sy	stem / De	finition					×
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
> Audio Input		Paramete	r			Stream A	nnouncer	nent					
<ul> <li>Audio Out Only</li> <li>Audio Output</li> </ul>		mDNS Ch	annel 1:	IP Add	ress	224.0.0.2	51			Port Number	5353	TTL 5	Enable 🔽
Conf Bus		mDNS Ch	annel 2:	IP Add	ress					Port Number	5354	TTL 5	Enable
Connect		mDNS Ch	annel 3:	IP Add	ress					Port Number	5355	TTL 5	Enable
EmBER+ EmBER+ A-stage		mDNS Ch	annel 4:	IP Add	ress					Port Number	5356	TTL 5	Enable
GP Sum		SAP Chan	inel 1:	IP Add	ress	239.255.	255.255			Port Number	9875	TTL 255	Enable
> GPI/O		SAP Chan	nel 2:	IP Add	ress					Port Number	9876	TTL 255	Enable
GPI/O Network Label		SAP Chan	inel 3:	IP Add	ress					Port Number	9877	TTL 255	Enable
> Level Control		SAP Chan	inel 4:	IP Add	ress					Port Number	9878	TTL 255	Enable
> MF Key Minimix		Paramete	r			PTP Setti	ngs						
Source		Domain				0							
> Sum Bus		Prio 1				128							
> Surface		Prio 2				128							
<ul> <li>System</li> <li>Definition</li> </ul>		Master Ar	nounce In	terval		1 -> 2s		•					
		Master Sy	nc Interva			-2 -> 0,2	5s 🔹	•					

For each channel, enter the multicast **IP Address**, **Port Number** and **TTL** value (in seconds). Use the **Enable** checkbox to enable or disable the channel.

For convenience, temporary changes to the channel settings can be made from the Power Core Web UI (via the RAVENNA -> Global tab).



## **PTP Settings**

"System -> Definition -> Parameter = PTP Settings"

These parameters define the PTP settings for Power Core.

Two global PTP modes are supported: slave only and master-slave.

If **Slave Only** is enabled, then Power Core is forced to operate as a PTP slave at all times. In this mode, the device looks for an incoming PTP signal from an external GrandMaster (GM). The other PTP settings must be the same as the PTP GM so as to sync successfully.

If **Slave Only** is disabled, then Power Core will operate in PTP master-slave mode. In this mode, the PTP priorities set within the device itself and all other streaming nodes determine the current PTP master (as described below).

Parameter	PTP Settings
Domain	0
Prio 1	128
Prio 2	128
Master Announce Interval	1 -> 2s 🔹
Master Sync Interval	-1 -> 0,5s 🔹 💌
Master TTL	10
Slave Only	
Slave Only Delay Requests	
DSCP	56
Slave WAN Mode	

Parameter	PTP Settings - reference name for the element.
Slave Only	Defines the global PTP mode: slave only or master-slave.
Prio 1, Prio 2	<ul> <li>Set the PTP priorities for Power Core.</li> <li>If Power Core is operating in master-slave mode, all master-capable devices on the network elect the PTP master according to a common algorithm known as the "Best Master Clock Algorithm". The algorithm compares the following parameters in turn:</li> <li>Prio 1 - the lower the number, the higher the priority of the device.</li> <li>Clock Class</li> <li>Prio 2 - as for Prio 1.</li> <li>MAC Address</li> <li>Note that the Clock Class is not available in Power Core but may be used by a third-party GrandMaster if one is installed.</li> </ul>
DSCP	This field assigns a DSCP value to the PTP clock stream. The default value is 56.
Domain	The remaining settings vary depending on the network architecture and PTP profile in use. Please
Master Announce Interval	refer to the <u>Lawo IP Networking Guide</u> . The default values are shown above.
Master Sync Interval	
Master TTL	
Slave WAN Mode	

For convenience, temporary changes to the PTP settings can be made from the Power Core Web UI (via the RAVENNA -> PTP tab).



# **Control Settings**

"System -> Definition -> Parameter = Control Settings"

#### These parameters define the control settings applicable to RAVENNA.

Parameter	Control Settings
Matrix Offset	0 * Factor 128 *
EmBER+ Local Provider	1 •
mDNS/SAP Startup Delay after Join [s]	2
mDNS Redundant Queries Respond Behaviour	respond each ins 💌
SDP Announcing via mDNS enabled	
Nodes List TTLs [s]	300
Streams List TTLs [s]	300

Parameter	Control Settings - reference name for the element.
Matrix Offset	Applies a global offset to any matrix-enabled inputs and outputs defined in the " <u>Audio Input -&gt;</u> <u>RAVENNA</u> " and " <u>Audio Output -&gt; RAVENNA</u> " branches of the 'Tree Definition'.
EmBER+ Local Provider	This field can be used to publish all available RAVENNA parameters to an Ember+ provider - enter the provider number from <b>1</b> to <b>5</b> , or select <b>None</b> to disable publishing via Ember+.
	The next three options affect what happens when streams are announced to the network.
mDNS/SAP Startup Delay After Join	Delays mDNS/SAP announcements (in seconds).
mDNS Redundant Queries Respond Behaviour	<ul> <li>Defines how Power Core responds to mDNS queries. There are two possibilities:</li> <li>respond each instantly (default) - every query is answered immediately. If there are many enquirers and many streams, this can lead to a large flood of announcements.</li> <li>collect and respond once (optimized operation) - after receiving a query, Power Core waits 10 seconds before a response is sent. If queries are received within this period, the timer is reset (to 10 seconds). The responses are sent either once the timer has expired or after 45 seconds (whichever is the soonest). In this way, several enquiries are answered collectively and a flood of announcements is avoided. There are separate timers for general queries and per stream.</li> <li>Please note: Collect and respond is recommended for SDP announments in mDNS. To use it, make sure that all Power Cores in your network are using version 6.6_PL-002 (ON-AIR Designer 6.6.0.20) or higher.</li> </ul>
SDP Announcing via mDNS enabled	Enable this option to include the SDP in mDNS announcements.
Nodes List TTLs	This value is applied if the "Update: Data + TTL" option is enabled in the RAVENNA -> Nodes tab of the Power Core Web UI. The default value is 300 (seconds). Possible values are 60 to 3600.
Streams List TTLs	As above, but applies to the RAVENNA -> Streams tab.



# **Stream Settings**

#### "System -> Definition -> Parameter = Stream Settings"

#### These parameters define the global settings for transmit (Tx) and receive (Rx) streams.

Parameter	Stream Settings
TX RTP Payload Type	98
TX DSCP	46
SSM Enable (IGMP v3 only)	
IGMP v1/2 Disable	
IGMP Router Alert option	
IGMP Legacy Suppression	
EmBER+ SDP Stream Names with Suffix	
RX Make-before-Break Enable	
RX Syntonous Mode Enable	
RX Re-Tuning Disable	
RX Re-Tuning only on both Channels fail	
RX Time-Offset Base Margin	5

Parameter	Stream Settings - reference name for the element.
Tx RTP Payload Type	This field defines the RTP payload for TX streams. The default value is 98.
Tx DSCP	This field assigns a DSCP value to TX streams. The default value is 46.
SSM Enable (IGMP v3 only)	Select this checkbox to enable IGMP v3.
IGMP v1/2 Disable	Select this checkbox to disable IGMP v1/2. The possible combinations with <b>SSM Enable</b> are described later.
IGMP Router Alert option IGMP Legacy Suppression	The next two options can be used to configure the IGMP behaviour (described <u>later</u> ). If in doubt, leave both options enabled.
EmBER+ SDP Stream Names with Suffix	Select this checkbox to automatically apply a suffix to Ember+ Stream Names. The suffix is required if the same stream name is used by different senders. The suffix must be deactivated when streams are sent both by logic elements and by Ember+.
RX Make-before- Break Enable	Select this checkbox to enable make-before-break in the receiver.
RX Syntonous Mode Enable	Select this checkbox to enable syntonous mode in the receiver.
RX Re-Tuning Disable	Select this checkbox to disable the automatic retuning of streams by permanent late packets. If enabled, the tuning of streams must be triggered manually, via the Web UI, if this is desired. See Retuning Streams. There is one exception which is when a new stream is connected and there is no Time Offset value stored in NVRAM. In this case, an automatic tuning of the stream is performed.
RX Re-Tuning only on both Channels fail	Select this checkbox to change the automatic tuning of redundant streams in the receiver. When enabled, re-tuning only occurs if both channels fail.
RX Time-Offset Base Margin	Sets the Time Offset Base Margin (in samples). The value contributes to the overall Time Offset applied during stream tuning. The default value is 5.



#### IGMP

The Internet Group Management Protocol (IGMP) is used in IPv4 networks to establish multicast group memberships.

There are three versions of IGMP: v2 improves upon v1 by adding the ability for a host to leave a multicast group; v3 improves upon v2 by supporting Source Specific Multicast (SSM). SSM is a method of delivering multicast packets in which the only packets delivered to a receiver originate from a specific source address. Thus, SSM reduces demands on the network and improves security.

#### Setting the IGMP Scheme

The **SSM Enable (IGMP v3 only)** and **IGMP v1/2 Disable** options determine how IGMP Joins are transmitted. There are two possibilities: Any Source Multicast (ASM) or Source Specific Multicast (SSM). The table below describes what happens when the options are combined.

IGMP v1/2 Disable	SSM Enable (IGMP v3 only)	Result
OFF	OFF	IGMP Joins are sent as IGMP v2 (Any Source Multicast).
OFF	ON	IGMP Joins are sent, by default, as IGMP v3 (Source Specific Multicast). If Power Core receives queries in v2, it reverts to v2 and keeps sending in v2.
ON	OFF	IGMP Joins are sent as IGMP v2 (Any Source Multicast).
ON	ON	IGMP Joins are sent as IGMP v3 (Source Specific Multicast). There is no fallback to v2 and so Power Core keeps sending IGMP v3 only.

#### > Configuring the IGMP Behavior

The following options are active by default and can be deactivated as required. This is sometimes necessary, depending on the type of network switch in use. If in doubt, leave both options enabled.

• **IGMP Legacy Suppression** (sysctl: net.inet.igmp.legacysupp)

If this variable is non-zero, then IGMP v1 and v2 membership reports received on a link are allowed to suppress the IGMP v3 state-change reports which would otherwise be issued.

• **IGMP Router Alert option** (sysctl: net.inet.igmp.sendra)

If this variable is non-zero, then IGMP v2 and v3 reports contain the IP Router Alert option.

#### > Receiving single streams as ASM in a SSM environment

It is also possible to connect individual streams as ASM in a SSM environment if:

- The SDP received via Ember+ has the source IP address omitted from the source-filter field.
- A RAVENNA Static Stream is configured where the multicast source IP address field is left blank.

#### Example SDP (with source IP Address omitted)



#### Jitter Classes

"System -> Definition -> Parameter = Jitter Classes"

These parameters define the five Jitter Classes supported by Power Core, and their Time Offset Additions which are applied during stream tuning.

In each case, you should enter a **Jitter Max** value (to define the Jitter Classes) and a corresponding **Time Offset Addition** (applied when streams are tuned). Stream tuning occurs automatically when you first connect a stream to a RAVENNA receiver. It can also be performed manually from the Power Core Web UI (via the RAVENNA -> Stream Destinations tab).

The 'Tree Definition' parameters are as follows:

Parameter	Jitter Classes	
Class 1: Jitter Max	2	
Class 2: Jitter Max	5	Time Offset Addition 50
Class 3: Jitter Max	10	Time Offset Addition 100
Class 4: Jitter Max	20	Time Offset Addition 200
Class 5: Jitter Max	512	Time Offset Addition 400
Jitter Class Select Mode	Peak Jitter 👻	

Parameter	Jitter Classes - reference name for the element.
Jitter Max	These fields define the maximum value for each jitter class (in samples). The default values are shown above.
Time Offset Addition	These fields define the Time Offset Addition applied to each Jitter Class (in samples). The default values are shown above.
Jitter Class Select Mode	This option defines which measurement is used to place streams in a particular Jitter Class. There are two possibilities: <b>Peak Jitter</b> (the default) or <b>Jitter StdDev</b> (the standard deviation). Since peak jitter is usually greater than the standard deviation, this mode will result in higher Time Offset values. Thus, to keep latency to a minimum, you should switch to the standard deviation ( <b>Jitter StdDev</b> ) mode.

#### Path Delay Classes

#### "System -> Definition -> Parameter = Path Delay Classes"

These parameters define the five Path Delay Classes supported by Power Core, and their Time Offset Additions which are applied during stream tuning.

In each case, you should enter a **Path Delay Max** value (to define the Path Delay Classes) and a corresponding **Time Offset Addition** (applied when streams are tuned). Stream tuning occurs automatically when you first connect a stream to a RAVENNA receiver. It can also be performed manually from the Power Core Web UI (via the RAVENNA -> Stream Destinations tab).

The 'Tree Definition' parameters are as follows:

Parameter	PathDelay Classes	
Class 1: PathDelay Max	10	
Class 2: PathDelay Max	30	Time Offset Addition 15
Class 3: PathDelay Max	100	Time Offset Addition 30
Class 4: PathDelay Max	300	Time Offset Addition 45
Class 5: PathDelay Max	1000	Time Offset Addition 60

Parameter	Path Delay Classes - reference name for the element.
Path Delay Max	These fields define the maximum value for each path delay class (in samples). The default values are shown above.
Time Offset Addition	These fields define the Time Offset Addition applied to each Path Delay Class (in samples). The default values are shown above.



# 4.2 **RAVENNA** in the Compact Engine

Audio can be streamed to and from the **Compact Engine** if a RAVENNA IO card is fitted to one of the front expansion slots. Only the left-hand slot can support the internal MADI bridge option and be used as a master clock source.

On its own, the IO card provides 8 inputs and 8 outputs from the RAVENNA streaming port to and from the system (via the TDM backplane). However, the RAVENNA interface itself is capable of streaming 64 bidirectional channels. You can gain access to the additional channels by utilising the spare internal MADI port (which exists on systems fitted with either 0 or 2 external MADI ports). To support this option, an internal MADI bridge connector must be fitted. Note that a Compact Engine fitted with 4 external MADI ports cannot support this feature (as there is no spare internal MADI port).

The ON-AIR Designer defines whether the internal MADI to RAVENNA bridge option is enabled and the name, label and other parameters for each RAVENNA input and output. Once the configuration is in place, the RAVENNA Web UI must be used to map the RAVENNA signals to the Tx and Rx streams.

# 4.2.1 Enable MADI over RAVENNA

To use the RAVENNA IO card as a 64-channel interface, the internal MADI to RAVENNA bridge option must be enabled.

**1.** Start by checking that the System Core is configured with either a 0-port or 2-port MADI card and a RAVENNA IO card (in expansion slot 1):



**2.** Then open the "Audio Input" branch of the 'Tree Definition', select the Compact Engine Madi card and the **RAVENNA** tab:

OA	System	n Core	×	OA		Parame	ter: Compact Engine 2xMadi	Madi	×	OA	Tree	defir
Name	Value	Madi 1 (RAVENNA intern) Input	Madi	3 Input	Madi 4 Input	Madi 1	(RAVENNA intern) Output	Madi 3 Output	Madi 4 O	utput	RAVENNA	
✓ Audio Input		Enable MADI1 over RAVENNA On	-	RAVENNA	Element No. non	e •						
Compact Engine BaseUnit												
> Compact Engine 2xMadi Madi		Enable MADI3 over RAVENNA Off	•									
> Definition		Enable MADI4 over RAVENNA Off	-									
> Ravenna Card PlugIn Slot 1												
> Audio Output												
> Conf Bus												

3. The Enable MADI over RAVENNA options should be set to On for MADI 1 and Off for all other ports.



# 4.2.2 RAVENNA IO Parameters

Once the **Enable MADI over RAVENNA** option is turned on, you can edit the name and other parameters for the 64 signals.

1. Use the Madi 1 (RAVENNA intern) Input and Output tabs to access the parameters.

#### Madi 1 (RAVENNA intern) Outputs

OA Treedefinition: / Audi	o Input /	Compact Engine 2xMadi Madi	× 04		System Core		× 0A		Parameter: Compact Engine 2xMadi Madi	×
Name	Value	Madi 1 (RAVENNA intern) Input	Madi 3 Input	Madi 4 Input	Madi 1 (RAVENNA intern) Output	Madi 3 Output	Madi 4 Output	RAVENNA		
<ul> <li>Audio Input</li> </ul>		P1.Output 1 M_OUT001.	L		Type: Stereo 🔻					
> Compact Engine BaseUnit		Default Audio		Mat	rix enable OFF -					
Compact Engine 2xMadi Madi Definition		Transparent								
> Ravenna Card PlugIn Slot 1		Mono Alias								
> Audio Output		RAVENNA Stream Size 2	-							
> Conf Bus										
> Connect		P1.Output 2 M_OUT001.	R							
EmBER+ GP Sum		Default Audio		Mat	rix enable OFF -					
> GPI/O		Transparent								
GPI/O Network		Mono Alias								
> Level Control										

#### Madi 1 (RAVENNA intern) Inputs

OA Treedefinition: / Audi	o Input /	Compact Engine 2xMadi Madi	×	OA		System C	ore		×	OA		Parameter: Compact Engine 2xMadi Madi	×
Name	Value	Madi 1 (RAVENNA intern) Input	Madi 3	Input	Madi 4 Input	Madi 1 (RAVENNA inte	rn) Output	Madi 3 Output	Madi 4 O	utput	RAVENNA		
Audio Input     Compact Engine BaseUnit     Compact Engine 2xMadi Madi     Definition		P1.Input 1 M_IN001.L Transparent Mono Alias		Default I		Type: Stereo	•						
Ravenna Card PlugIn Slot 1     Audio Output     Conf Bus     Connect     EmBER+		P1.Input 2 M_IN001.R Transparent Mono Alias		Default I	Matrix e RAVENNA Source	nable OFF	•						

Note that the MADI ports are numbered from right to left in the configuration. Therefore, MADI 4 and MADI 3 relate to the two external MADI ports (on a 2-port MADI card), while MADI 2 and MADI 1 are the spare internal ports. MADI 1 is always reserved internally for RAVENNA.

Most of the parameters are handled in an identical manner to other signals. See MADI IO for details.

When defining the names, every input can generate a RAVENNA Destination label, and every output a RAVENNA Source Label. The labels can be used to define a default source stream for a RAVENNA input or group of inputs. To implement this feature, the **Name** field must use the format [GroupName]:[SignalName], where each label field is a maximum of 8 characters. Every label must be unique within the system network.

#### **Output Parameters**

- Name defines the signal name. Use the format [GroupName]:[SignalName] to generate a RAVENNA Source Label.
- Type defines the format of the output: mono, stereo, etc. This should match the Stream Size.
- Matrix enable by turning ON the Matrix Enable option, the output can be controlled by a matrix.
- **Default Audio** alternatively, if **Matrix Enable** is **OFF**, a permanent audio source can be assigned to the output. Note that the **Default Audio** setting is ignored when **Matrix Enable** is **ON**.
- **Transparent** select this checkbox to set the output to be "transparent".
- **RAVENNA Stream Size** defines the number of audio channels used by the stream. This should match the audio output format (**Type**).

#### Input Parameters

- Name defines the signal name. Use the format [GroupName]:[SignalName] to generate a RAVENNA Destination Label.
- Type defines the format of the input: mono, stereo, etc. This should match the Stream Size.
- Matrix enable by turning ON the Matrix Enable option, the input can be controlled by a matrix.
- Transparent select this checkbox to set the output to be "transparent".
- **Default RAVENNA Source Label** (optional) defines the stream you wish subscribe to by entering its RAVENNA Source Label. This option can be used to permanently link the receiver to a stream. To use this feature, you must follow the [GroupName]:[SignalName] labeling convention described above.



# 5. Intercom

This chapter describes the InterCom system.



# 5.1 Introduction

Intercom elements are supported by crystal, sapphire, sapphire compact, Nova29 and ruby / Power Core. They provide easy programing for communications setups, and work in conjunction with the separate software application called InterCom.

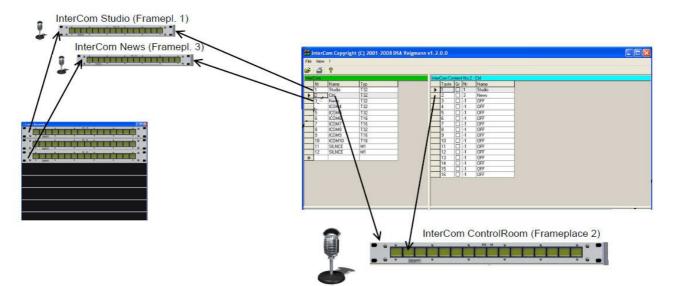
Within the system configuration, an InterCom element is defined for each communications station (e.g. Studio 1, Studio 2, Announcer's Booth, etc.) The element defines the talkback send and return, and the call and response buttons. The talkback buttons can be console MF Keys, external key panels, VisTool touch-screens or external control signals.

Each InterCom element uses a summing bus resource. This means that the limit on InterCom elements varies depending on the product.

The **InterCom** software is then used to program the talkback buttons for each communications station. Each button can talk to a single InterCom station, answer an incoming call or talk to a group of stations. At any time, you can transfer the Intercom configuration to any system within your studio network, where it is stored separately from the system configuration and loads on boot up.

You can transfer a new InterCom configuration without restarting the system. This allows you to modify InterCom functions while the system is running online.

The InterCom configuration is referenced to elements within the system configuration. Thus, InterCom functions can only be executed when loaded to a console with the corresponding system configuration.





# 5.2 InterCom Local vs InterCom Net

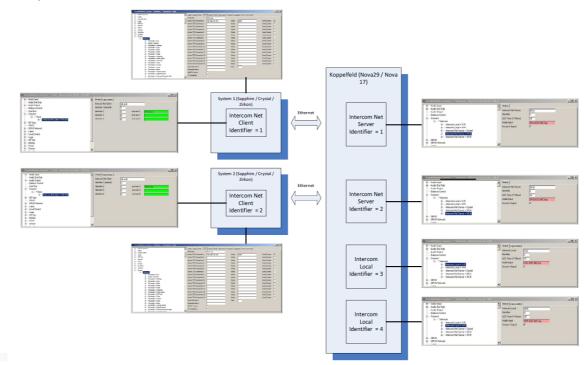
Within the system configuration (defined by the ON-AIR Designer), three different elements are supported: Intercom Local, Intercom Net Server and Intercom Net Client.

**Intercom Local** elements should be used when the Intercom Stations are connected to a single Lawo system (e.g. MF Keys, key panels and/or VisTools connected to a Nova29 router).

The **Intercom Net Server** and **Intercom Net Client** elements allow you to create a single intercom system using Intercom Stations connected to different Lawo systems. This reduces the need for separate cabling, as the CAN bus is used for data transfer and MADI tielines can be used to transfer audio signals. With this type of setup, the basic intercom configuration is done on the server, while clients can connect to the server for control signals. Key assignments are also configured on the client side.

Note that every Intercom station needs an Intercom Net Client element on the local unit, and an Intercom Net Server element on the remote server unit.

crystal and sapphire compact systems support Intercom Net Client elements only. This means that they can communicate with an Intercom Net Server system, but cannot "host" a stand-alone Intercom system.



Our example below shows how all three elements can be combined:

Once the elements have been configured on all of the participating systems, you can then use the <u>Intercom</u> <u>Software</u> to transfer an InterCom configuration to the server.



# 5.3 System Configuration

Before you can use the **InterCom** software, you must program and transfer a a system configuration using the ON-AIR Designer software.

For our example, eight steps are required:

- 1. Name the audio inputs where each talkback microphone is connected
- 2. Add an Intercom element for each communications station.
- 3. Define the Intercom global parameters to name the element, assign the talkback audio input, and so on.
- 4. Configure the talkback outputs name and set the default audio path for each talkback return.

**5.** Define the control signals you wish to use as talkback buttons for each communications station (in our example, we are using MF Keys).

6. Define the Intercom key events - to reference the MF Keys defined in step 5.

7. Configure the MF Key Lamps and Labels - to define how the talkback buttons will respond to incoming calls and how they light when pressed.

8. Save and transfer the system configuration.

# 5.3.1 Naming the Talkback Inputs

Start by naming the audio inputs where each talkback microphone is connected – in our example, we have three mics connected to different MADI inputs of a Nova29 router:

• Treedefinition: / Aud	lio Input / MADI Port 01							- • •
Name	Value	Madi Input	Madi Output RAVENNA					
<ul> <li>Audio Input</li> <li>DMS</li> </ul>		Input 01	ICOM_ST1_MIC	Type: Mono 🔻	Dig Offset Gain 0	Matrix enable ON	• •	Transparent 🗖 🔺
> Loopback Port 01		Input 02	P01.111 02		Dig Offset Gain 0	Matrix enable ON	<del>ب</del> ا	Transparent
Loopback Port 02 Loopback Port 03		Input 03	P01.IN 03	Type: Stereo 🗔	Dig Offset Gain 0	Matrix enable ON	• •	Transparent
Loopback Port 04		Input 04	P01.IN 04		Dig Offset Gain 0	Matrix enable ON	<del>ب</del> ا	Transparent 🗖
> MADI Port 01 > MADI Port 02		Input 05	P01.IN 05	Type: Stereo	Dig Offset Gain 0	Matrix enable ON	4 👻	Transparent

• Treedefinition: / Aud	io Input / MADI Port 02							- • ×
Name	Value	Madi Input	Madi Output PAVENNA					
<ul> <li>Audio Input</li> <li>DMS</li> </ul>		Input 01	ICOM_ST2_MIC	🕨 Type: Mono 🔻	Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗌 🔺
> Loopback Port 01		Input 02	P02.1N U2		Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗖
<ul> <li>Loopback Port 02</li> <li>Loopback Port 03</li> </ul>		Input 03	P02.IN 03	Type: Stereo	Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗆
> Loopback Port 04		Input 04	P02.IN 04	]	Dig Offset Gain 0	Matrix enable ON	-	Transparent 🗖
> MADI Port 01 > MADI Port 02		Input 05	P02.IN 05	Type: Stereo	Dig Offset Gain 0	Matrix enable ON	-	Transparent 🗔
> MADI Port 03		Input 06	P02.IN 06		Dig Offset Gain 0	Matrix enable ON	-	Transparent 🗖

OA Treedefinition: / Audio	nput / MADI Port 03							
Name	Value	Madi Input	Madi Output PAVENNA					
<ul> <li>Audio Input</li> <li>DMS</li> </ul>		Input 01	ICOM_ST3_MIC	Type: Mono 🔻	Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗌 🔺
<ul> <li>Loopback Port 01</li> </ul>		Input 02	P03.1N 02	]	Dig Offset Gain 0	Matrix enable ON	•	Transparent
> Loopback Port 02 > Loopback Port 03		Input 03	P03.IN 03	Type: Stereo	Dig Offset Gain 0	Matrix enable ON	-	Transparent 🗖
> Loopback Port 03		Input 04	P03.IN 04		Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗖
> MADI Port 01 > MADI Port 02		Input 05	P03.IN 05	Type: Stereo	Dig Offset Gain 0	Matrix enable ON	-	Transparent 🗔
> MADI Port 02 > MADI Port 03		Input 06	P03.IN 06	]	Dig Offset Gain 0	Matrix enable ON	•	Transparent 🗖



# 5.3.2 Adding the Intercom Elements

Add an **Intercom Local** element for each communications station to the "**Connect**" branch of the 'Tree Definition':

+		
io Input io Out Only io Out Only ince Control nect * Desk tent State IER+ IO IO No Network Iden IO IO No Network Iden IO IO IO IO IO IO IO IO IO IO	Connect Desk Intercom Local Intercom Net Client Intercom Net Server Matrix Connect Matrix Query Priconnect TConn64	
	Delete New Re	ename

Or, to create an Intercom system using more than one console/router, add an Intercom Net Server element to the server and Intercom Net Client element to the client.



# 5.3.3 Defining the Intercom Global Parameters

Select each Intercom element to define its Global parameters.

#### Intercom Local

Treedefinition: / Connect / * Desk / Intercon	n Local = Intercom	Le Treeselection	? ×	
Name     Value       Audio Linput        Audio Output        Balance Control        Connect     >       > Intercom Local ICOM_ST1     >       > Intercom Local ICOM_ST3       Element State       EmBER +        GPI/O        GPI/O Network        Hidden        Label        Level Control        Logic     MF Key       Minimix     Panel       System        Universal Sum In        Universal Sum Out	Global Key Events Intercom Local ICOM_ST3 Identifier LED Time (1/10sec) 30 Audio Input ICOM_ST3_MIC.Inp Group In Signal	✓ Audio Input	Cancel	
Intercom	Enter a unique reference name.			
Identifier	Enter a unique reference numbe	er. This number is used to identif	v the elemer	nt within the

Intercom	Enter a unique reference name.
ldentifier	Enter a unique reference number. This number is used to identify the element within the InterCom software, see <u>Adding an InterCom station</u> . The nova29 support an Identifier range up to 96. The Identifier range for sapphire and crystal is limited to 48; these systems will ignore numbers higher than 48.
LED Time (1/10sec)	Enter the timeout for the signalisation of an incoming call. The button lamp/LED will stop blinking after this time.
Audio Input	Assign the audio input to be used as the talkback source. For our example, this should be the talkback mic named <u>earlier</u> .
Group In Signal	Select this checkbox to enable group key blinking. When enabled, and the group is active, all group keys to which the caller is assigned blink.



#### **Intercom Net Server**

	Name	Value	Global	
>	Audio Input		Intercom Net Server	Intercom
>	Audio Out Only		Intercommet server	Intercom
>	Audio Output		Identifier	4
	Balance Control		LED Time (1/10sec)	30
~	Connect		LED TIME (1/103CC)	
	✓ * Desk		Audio Input	ICOM_ST1_MIC.Inp
	> Intercom Local	ICOM_ST1	Group In Signal	
	> Intercom Local	ICOM_ST2		
	> Intercom Local	ICOM_ST3	IP Addr[3]	101
	> Intercom Net Server	Intercom	IP Addr [4]	75
	Element State		a riddi [ ij	
	EmBER +			

As for Intercom Local, but with the following exceptions and additions:

Identifier	This number will identify the element within the <u>InterCom software</u> AND within the <b>Intercom</b> <b>Net Client</b> .
IP Addr[3] IP Addr[4]	Enter the third and fourth byte of the Intercom Net Client's IP address. This is used to identify the client to the server, in conjunction with the Identifier number.

#### Intercom Net Client

• Treedefinition: / Connect / * Desk / Int	tercom Net Client = Intercom	ı			×
Name	Value	^	Global	Key Events	
> Audio Input			Intercom Net	et Client IntercomClient	
> Audio Out Only					
> Audio Output			Identifier 1 (	(default) 4	
Balance Control			Identifier 2	0 activate 2	
Conf Bus			ruenuner 2		
✓ Connect			Identifier 3	0 activate 3	
✓ * Desk			Identifier 4	0 activate 4	
Intercom Net Client	IntercomClient		Identifier 4		
> Priconnect	LSP Lf				
· · · ·					

As for Intercom Local, but with the following exceptions and additions:

Identifier 1 to 4	Enter the same Identifier number as configured on the Intercom Net Server.
	You can enter up to four different Identifiers (Identifiers 2, 3 and 4 are enabled by the activate control signals). This allows the client to connect and work with different Intercom Net Server elements (these may be on different systems).



# 5.3.4 Configuring the Talkback Outputs

Next, name and set the default audio path for each talkback return – in our example, we have three talkback speakers connected to different MADI outputs of the Nova29 router. The **Default Audio** field is set to the output of the InterCom elements we defined earlier:

• Treedefinition: / Audi	o Output / MADI Port 01						- • ×
Name	Value	Madi Input Madi Output R/	VENNA	L. Treeselection	?	Х	
> Audio Input							
> Audio Out Only		Output 01 ICOM_ST1_SPKR	Type:	✓ Audio Input		^	It Audio COM_ST1.Out
<ul> <li>Audio Output</li> </ul>		Output 02 P01.OUT 02		✓ *Desk			It Audio
> MADI Port 01			Trans Obarra	<ul> <li>Intercom Local ICOM_ST1</li> </ul>			la Auda
> MADI Port 02		Output 03 P01.OUT 03	Type: Stereo	Out			ilt Audio
> MADI Port 03		Output 04 P01.OUT 04		> Intercom Local ICOM_ST2			It Audio
> MADI Port 04				> Intercom Local ICOM_ST3			11 A
> MADI Port 05		Output 05 P01.OUT 05	Type: Stereo	> DMS			It Audio
> MADI Port 06		Output 06 P01.OUT 06		> Definition			It Audio
> MADI Port 07		Output 07 P01.OUT 07	Type: Stereo	> GT 01			It Audio

Name	Value	Madi Input Madi Output	AVENNA	L. Treeselection	?	×	
Audio Input		Output 01 ICOM ST2 SPKR	Type:	V Audio Input			It Audie TCOM_ST2.Out
Audio Out Only Audio Output		Output 02 P02-OUT 02		<ul> <li>Addio input</li> <li>* Desk</li> </ul>			It Audio
> MADI Port 01		Output 03 P02.OUT 03	Type: Stereo I	> Intercom Local ICOM_ST1 ✓ Intercom Local ICOM_ST2			It Audio
MADI Port 02 MADI Port 03		Output 04 P02.OUT 04		Out			It Audio
> MADI Port 04 > MADI Port 05		Output 05 P02.OUT 05	Type: Stereo I	<ul> <li>Intercom Local ICOM_ST3</li> <li>DMS</li> </ul>			It Audio
> MADI Port 06		Output 06 P02.OUT 06		> Definition			It Audio
> MADI Port 07 > MADI Port 08		Output 07 P02.OUT 07	Type: Stereo I	> GT 01 > GT 02			It Audio

• Treedefinition: / Audio	Output / MADI Port 03							
Name	Value	Madi Inpu	ut Madi Output RAVE	INNA	L. Treeselection	?	×	
> Audio Input		0.00	TOOM OT 2 COVD	Trees				
> Audio Out Only		Outputor	ICOM_ST3_SPKR	Type:	✓ Audio Input		^	It Audio COM_ST3.Out
<ul> <li>Audio Output</li> </ul>		Output 02	P03-OUT 02		✓ * Desk			It Audio
> MADI Port 01		0.100	P03.OUT 03	Type: Stereo	> Intercom Local ICOM_ST1			It Audio
> MADI Port 02		Output 03	P03.001 03	Type: Stereo	/ Intercom Local ICOM_ST2			
> MADI Port 03		Output 04	P03.OUT 04		✓ Intercom Local ICOM_ST3			It Audio
> MADI Port 04		Output 05	P03.OUT 05	Type: Stereo	Out			It Audio
> MADI Port 05		Output 05	P03.001 03	Type: Stereo	7 DMS			
> MADI Port 06		Output 06	P03.OUT 06		> Definition			It Audio
> MADI Port 07		Output 07	P03.OUT 07	Type: Stereo	> GT 01			It Audio
> MADI Port 08		Gaipur 07	103.00107	Trype, stereo i	> GT 02			



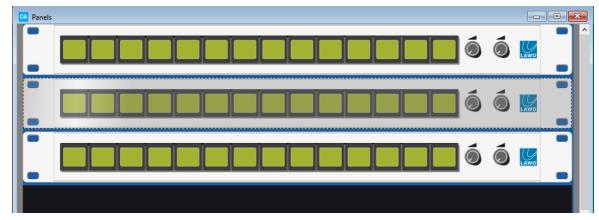
# 5.3.5 Defining the MF Keys

Next, name the control signals you wish to use as talkback buttons for each communications station.

You may use any type of control signal. This includes console MF Keys, MF Keys on an external key panel, VisTool screen buttons or external control signals.

In our example, we have a KSC-LCD14P2 panel for each of the 3 studios.

1. Add the key panels to the **Frames** -> **Panels** configuration:



2. Double-click to open the key panel parameters, and name each MF Key:

Page 1	Page 2	Page 3	Page 4	VCA	Module
Page 1LCD	1	MF1_ST1			
Red					
Yellow					
Green					
Blink					
Name Line 1	L	ST1			
Name Line 2	2	KEY1			
Label ID					
		[			
Page 1LCD	2	MF2_ST1			
Red					
Yellow					
Green					
Blink					
Name Line 1		ST1			
Name Line 2	2	KEY2			_
Label ID					
Page 1LCD	3	MF3_ST1			
Red		1.0_011			
Yellow					
Green					
Blink					
Name Line 1	L	ST1			
Name Line 2		KEY3			
Label ID					
Page 1LCD	4	MF1_ST4			

Name Line 1 and 2 are only supported by key panels with self-labeling buttons.



# 5.3.6 Defining the Intercom Element Key Events

Now return to each Intercom element to define the **Key Events** parameters. For our example, assign each of the MF Keys defined <u>earlier</u> to a key number.

• Treedefinition: / Connect / * Desk / Intercom I	.ocal = ICOM_ST1	
Name Value	Global Key Events	Treeselection ? X
> Audio Input	Key 1 MF1_ST1.Key	EmBER+
Audio Out Only     Audio Output	Disable 1	> GPI/O
✓ Connect		> Logic
✓ *Desk		✓ MF Key
> Intercom Local ICOM ST1	Key 2 MF2_ST1.Key	✓ KSC-LCD14P2 Module 1 (Adr. 1)
> Intercom Local ICOM ST2	Disable 2	Page 1LCD 1 MF1_ST1
> Intercom Local ICOM ST3		Кеу
EmBER+		> Page 1LCD 2 MF2_ST1
> GPI/O	Key 3 MF3_ST1.Key	> Page 1LCD 3 MF3_ST1
GPI/O Network	Disable 3	> Page 1LCD 4 MF1_ST4
> Level Control		> KSC-LCD 14P2 Module 2 (Adr. 2)
> Logic	Key 4 MF1_ST4.Key	> KSC-LCD14P2 Module 3 (Adr. 3)
> MF Key	Key 4 MF1_ST4.Key	> Panel
Minimix	Disable 4	
> Panel		
> System	Key 5	
Universal Sum In		
Universal Sum Out	Disable 5	
	Key 6	
	Disable 6	
		OK Cancel
Key 1 to n		n Key. The Keys are referenced within the InterCom ations. Note that a Key cannot talk to its own Intercom
		on the product. If both the Intercom Client and Server up to 48 Keys (per InterCom element). In all other d.
Disable 1 to n	Assigns a control signal to disable the	Key. For example, to override the InterCom system.

Repeat this process for each Intercom element in the configuration.



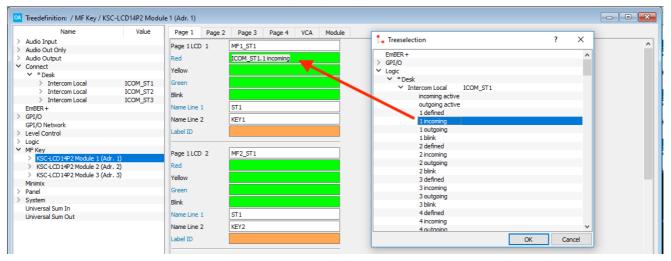
# 5.3.7 Configuring the MF Key Lamps and Labels

You can now define how your talkback buttons will respond to incoming calls and how they light when you press them. The example below shows the definition of the MF Key lamps and labels for a KSC-LCD14P2 panel. If you are using a VisTool touch-screen button or an external control signal, then you will need to define their signaling parameters accordingly.

Each Intercom element provides the following logic control signals:

incoming active	Active if any incoming call button is active.
outgoing active	Active if any outgoing call button is active.
n defined	Active when the specified button is configured within the InterCom software.
n incoming	Active when the specified incoming call button is active.
n outgoing	Active when the specified outgoing call button is active.
n blink	Active when the specified incoming call button is active (Alias of incoming).
n Label	The Name given to the InterCom station within the InterCom software.

#### MF Key Lamp configuration





#### MF Key Label configuration

Y * Desk         Yellow         ICCM_ST 1: I durgong         11abel           > Intercom Local         ICOM_ST 2         Green         ICOM_ST 1: I defined         2 Label           > Intercom Local         ICOM_ST 2         Bink         ICOM_ST 1: I bink         4 Label           Bink         ICOM_ST 1: I bink         4 Label         4 Label           GPI/O         GPI/O         ST 1         5 Label           > Level Control         Level Control         Label ID         ICOM_ST 1: I Label	? X
Audio Output         Red         ICOM_ST1.1 incoming <ul> <li>Audio Output</li> <li>Audio Output</li> <li>Connect</li> <li>Plosk</li> <li>Intercom Local</li> <li>ICOM_ST1</li> <li>Intercom Local</li> <li>ICOM_ST3</li> <li>Bink</li> <li>ICOM_ST1.1 bink</li> <li>Itabel</li> <li>Itabel</li></ul>	
✓ Connect     Yellow     ICOM_ST1.1 outgoing     ✓ Intercom Local       ✓ * Desk     ✓ Fellow     ICOM_ST1.1 outgoing     ✓ Intercom Local       ✓ Intercom Local     ICOM_ST1     Green     ICOM_ST1.1 defined     3 Label       > Intercom Local     ICOM_ST3     Blink     ICOM_ST1.1 defined     3 Label       > Intercom Local     ICOM_ST3     Name Line 1     ST1     5 Label       > GPI/O     GPI/O     KEY1     6 Label       GPI/O     Level Control     Label ID     ICOM_ST1.1 Label     8 Label       > Inscruptione     Yellow     MF2_ST1     11 Label     9 Label       > KSC4_CD14P2 Module 2 (Adr. 2)     Ked     13 Label     13 Label       > KSC4_CD14P2 Module 3 (Adr. 3)     Yellow     13 Label     14 Label	^
* * Desk         Yellow         ICCM_ST1.1 outgong         Itabel           > Intercom Local         ICOM_ST2         Green         ICOM_ST1.1 defined         2 Label           > Intercom Local         ICOM_ST3         Blink         ICOM_ST1.1 lefined         2 Label           > Intercom Local         ICOM_ST3         Blink         ICOM_ST1.1 lefined         2 Label           > Intercom Local         ICOM_ST3         Blink         ICOM_ST1.1 lefined         4 Label           > GPL/O         Stabel         Stabel         6 Label         6 Label         6 Label           > Level Control         Level Control         Label ID         ICOM_ST1.1 Label         8 Label           > KSC-LCD14P2 Module 1 (Adr. 1)         MF2_ST1         11 Label         9 Label           > KSC-LCD14P2 Module 2 (Adr. 2)         Red         13 Label         13 Label           > KSC-LCD14P2 Module 3 (Adr. 3)         Yellow         13 Label         14 Label	
V         Desk         Intercon Local         ICOM_STI         Icom_ST2         Itercon Local         ICOM_ST2           >         Intercon Local         ICOM_ST2         Bink         ICOM_ST1.1 blnk         3 label         3 label           >         Intercon Local         ICOM_ST2         Bink         ICOM_ST1.1 blnk         4 Label         3 label           >         Intercon Local         ICOM_ST3         Bink         ICOM_ST1.1 blnk         4 Label         3 label           >         GPI/O         Mame Line 1         ST1         5 Label         6 Label         6 Label         6 Label         7 Llabel         8 Label         9 Label         10 Label         12 Label         12 Label         12 Label         13 Label         13 Label         13 Label         14 Label <td>JM_ST1</td>	JM_ST1
> Intercon Local         ICOM_ST2           > Intercon Local         ICOM_ST3           Bink         ICOM_ST1.1bink           > GPI/O         ST1           GPI/O         ST1           GPI/O         ST1           SetUp	
b Intercon Local         ICOM_ST3         Blink         ICOM_ST1.1 blink         4 Label           EmBER+         GPI/O         ST1         St1         Stabel         Stabel           GPI/O         GPI/O         Name Line 1         ST1         Stabel         Stabel           J Level Control         Lobel ID         ICOM_ST1.1 Label         Stabel         Stabel         Stabel           V MF Key         SSC4CD14P2 Module 1 (Adr. 1)         MF2_ST1         11 Label         Stabel         Stabel           > KSC4CD14P2 Module 2 (Adr. 2)         Red         12 Label         Stabel         13 Label           > Minimix         Tellow         14 Label         Stabel         14 Label	
> Intercon Local         ICOM_ST3         Name Line 1         ST1         SLabel           > GPI/0         GPI/0         Name Line 1         ST1         SLabel         SLabel           > Level Control         Level Control         Label ID         ICOM_ST1.LLabel         SLabel         SLabel           > MRK Key         Jabel ID         ICOM_ST1.LLabel         SLabel         SLabel         SLabel           > KSC4.CD14P2 Module 2 (Adr. 2)         KE2         MF2_ST1         11Label         SLabel           > KSC4.CD14P2 Module 3 (Adr. 3)         Yellow         I3Label         I3Label         I3Label	
> GPI/O         September	
GPI/O Network         Name Line 2         KEY1         7 Label           > Level Control         Label ID         ICOM ST1.1 Label         8 Label         9 Label           > MF2_ST1         MF2_ST1         10 Label         9 Label         9 Label         9 Label         10 Label         11 Label         10 Label         11 Label         10 Label         12 Label         12 Label         12 Label         12 Label         13 Label         13 Label         14 Label	
GP1/0 Network         7 Label           > Level Control         IcoM_ST1.1Label         8 Label           > Logic         9 Label         9 Label           > MF Key         10 Label         9 Label           > KSC4_CD14P2 Module 2 (Adr. 2)         Red         12 Label           > KSC4_CD14P2 Module 3 (Adr. 3)         Yellow         13 Label	
> Logic         9 Label           ✓ MF Key         101 abel           > KSC-LCD14P2 Module 1 (Adr. 1)         Page 1 LCD 2         MF2_ST1         101 abel           > KSC-LCD14P2 Module 2 (Adr. 2)         Red         121 abel         121 abel           > KSC-LCD14P2 Module 3 (Adr. 3)         Yellow         131 label         131 label	
V MF Key         Page 1LCD 2         MF2_ST1         10 Label           > KSC4_CD14P2 Module 1 (Adr. 1)         Red         11 Label         12 Label           > KSC4_CD14P2 Module 3 (Adr. 2)         Red         13 Label         13 Label           Minimix         Yellow         14 Label         14 Label	
KSC-LCD14P2 Module 1 (Adr. 1)         Page 1LCD 2         MF2_ST1         11Label           > KSC-LCD14P2 Module 2 (Adr. 2)         Red         12Label         13Label           > KSC-LCD14P2 Module 3 (Adr. 3)         Yellow         13Label         13Label	
> KSC4CD14P2 Module 1 (Adr. 1)         111 Label           > KSC4CD14P2 Module 2 (Adr. 2)         Red         121 Label           > KSC4CD14P2 Module 3 (Adr. 3)         Yellow         131 Label           Minimix         141 Label         141 Label	
> KSCLCD14P2 Module 3 (Adr. 3)     Yellow     13 Label       Minimix     14 Label	
Minimix 14 Label	
Minimix 14 Label	
Danel Green 15 Label	
> System Blink 16 Label	
Universal Sum In 17 Label	
Universal Sum Out Name Line 1 ST1 18 Label	
Name Line 2 KEY2 19 Label	

# 5.3.8 Saving and Transferring the System Configuration

Having completed the configuration, you should now save and transfer your configuration to the system.

You must transfer the Intercom elements to the system before you can access the features of the <u>InterCom</u> <u>software</u>.



## 5.4 InterCom Software

The **InterCom** software is used to program the talkback buttons and then transfer the InterCom configuration to each system. Four steps are required:

- **1.** Create a new configuration.
- 2. Add the InterCom stations. This step names each station and defines the number of talkback buttons.

**3.** Define the InterCom content. Each button can call another InterCom station, answer any incoming call, call a group of InterCom stations or perform no function.

4. Save and transfer the InterCom configuration to the system.

**crystal** and **sapphire compact** systems support **Intercom Net Client** elements only. This means that they do not require a separate InterCom configuration; the InterCom configuration must be stored on the server's system.

## 5.4.1 System Requirements

### InterCom PC

To install and run InterCom, your computer MUST meet or exceed the following requirements:

- Operating System: Windows XP Professional SP3 or Windows 7 Ultimate. Note that Windows 10 LTSB (Long Term Servicing Branch) for Enterprise installations is not supported.
- Processor: Intel<sup>™</sup> Core i3 530 (or higher equivalent processor).
- Random access memory (RAM): 2GB
- Ethernet interface: 100MBit/s
- CAN over Ethernet service running (see Checking the CAN service).

### Lawo OnAir System

The Lawo OnAir system *MUST* be running OS Version 3.2 software or higher.

You can check the OS version using the Web UI.

If the OS-Version is lower than 3.2, please contact your local Lawo representative or email <u>support@lawo.com</u>.

crystal and sapphire compact systems support Intercom Net Client elements only and therefore do not require a separate InterCom configuration.

#### Network

You should connect the **InterCom** PC to the Master Board's Ethernet port either directly or via a network switch. *Do NOT* use an Ethernet hub as this will interrupt the data stream. See Wiring: CONTROL Network.



## 5.4.2 Installing the Software

The **DSA InterCom.exe** setup application, included with your system, performs an automatic install of the InterCom software.

- 1. Copy the **DSA InterCom.exe** application onto your computer.
- 2. Double click on the DSA InterCom.exe application icon:

Name 🔺	Size	Туре	Date Modified
BDSA InterCom 1.2.0.5	6,345 KB	Application	13/04/2010 17:49
NovaConnect 6.1.0.16_tcp	2,000 KB	Application	13/04/2010 17:49
VisTool 3.1.0.9	14,719 KB	Application	11/06/2010 00:00
Zirkon 3.2.0.2	14,054 KB	Application	15/06/2010 13:19
Zirkon Macros 2.7.2a	1,949 KB	Application	08/11/2007 14:30

This starts the 'Setup Wizard':

🕼 Setup - DSA InterCom	
LAWO	Welcome to the DSA InterCom Setup Wizard
Networking Audio Systems	This will install DSA InterCom 1.2.0.5 on your computer.
	It is recommended that you close all other applications before continuing.
poreced by DSA Vugnam	Click Next to continue, or Cancel to exit Setup.
	Next > Cancel

- 3. Follow the Wizard's instructions accepting the default options provided.
- 4. When you reach the 'Summary' window, check the options and click Install.

The software is installed onto your computer; this may take a few minutes. By default, files are installed in the location: 'C:\Program Files\Lawo'.

- 5. When the installation is complete, a confirmation window appears.
- 6. Click on **Finish** to exit the 'Setup Wizard'.

If you have any problems with the software installation, please contact your local Lawo representative or email <a href="mailto:support@lawo.com">support@lawo.com</a>.



## 5.4.3 Checking the CAN Service

The **InterCom** software talks to the system by running a CAN service over the Ethernet connection. To check or enable this service, use the **MtxConAdmin** application as follows.

MtxCon (also known as NovaConnect) is the software used to control a Nova17 or Nova29 stand alone matrix. You can download and install this software from <u>www.lawo.com</u>.

Having installed MtxCon:

1. Open the MtxConAdmin application on your computer:



2. Enter the IP address of the system and select **Next**:

關 MtxCon A	MtxCon Admin 6.1.16				
	CAN TCP/IP Settings If you use Can over TCP, change the addresses to your own desire.				
redundand	cy use only.	ect to the whole system. The second addre	ess is for		
Addresses		Port:			
	192.168.101.240	18500			
	192.168.101.241	18500			
		< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel		

If you have a redundant Master Board, you should also tick the second entry box and enter the IP address of the redundant board.



3. Next select the ports you wish to use for the CAN service:

MtxCon Admin 6.1.16	X
CAN PCI Settings If you have a Can PCI card installed, select the ports you wish to use.	MTX INST
If you plan to use different ports for different applications, you can specify here, which ports are used by MtxCon. Ports (Write): I I I I I I I I I I I I I I I I I I I	ı
< <u>B</u> ack <u>Next</u> >	<u>C</u> ancel

4. Select the configuration database for **MtxCon**; the default location is shown below:

🗰 MtxCon Admin 6.1.16	×
<b>Database</b> You need to set the configuration database for MtxCon	MTX INST
Please be carefull. This will take affect to all users.	
Database:	
C:\Program Files\Lawo\NovaConnect\database\kpf.mdb	
	_
< <u>B</u> ack <u>N</u> ext >	<u>C</u> ancel



If the CAN service is already running, then you will see the following window.

MtxCon Admin 6.1.16	×
Windows Service To take affect of your changings, the Windows Service needs to be restarted.	MTX INST
The Windows Service does not need to be restarted.	
Windows Service: ☞ Restant	
< <u>B</u> ack <u>F</u> inish	<u>C</u> ancel

5. Tick the **Restart** box and click **Finish** if you wish to restart the service.

Once the CAN service is running, you will see the following confirmation box:

MtxCon Admin 6.1.16	×
Windows Service To take affect of your changings, the Windows Service needs to be restarted.	MTX
The Windows Service does not need to be restarted.          Windows Service:       MtxCon Admin         Restart       Windows service restarted successfully.         OK	
< <u>B</u> ack <u>F</u> inish	<u>C</u> ancel

6. Click **OK** and **Cancel** to exit the MtxConAdmin application.

Running CAN over Ethernet can affect the performance of your PC. Therefore, you should cancel the service once you have finished running the **InterCom** software.

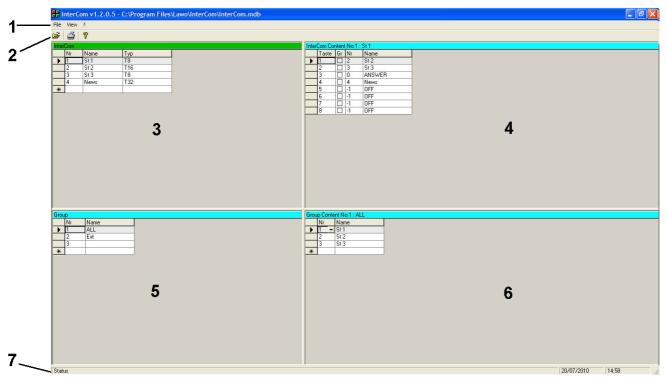


## 5.4.4 Operating Principles

1. Start the InterCom software, by selecting **START** -> **Program Files** -> **Zirkon** -> **InterCom**.

If this is the first time you have run the software, then you will be asked for the location of the InterCom database file. The default location is in the C:\Program Files\InterCom folder. If you have already been using the InterCom software, then the last file you saved from the software is automatically opened for you.

In either case, the InterCom operating window appears. It is divided into the following areas:



### 1 Menus

File, View and Help main menus.

### 2 Toolbar

Quick access to common functions such as **Open**, **Print** and **Help**.

### 3 InterCom

This area defines each InterCom station. Each entry is given a number (Nr), a Name (up to 6 characters) and Type.

The **Nr** must match the InterCom <u>Identifier</u> set within the system configuration. The **Typ** defines how many keys are available at the station.

### 4 InterCom Content

Double-click on an entry from the InterCom list (3) and the InterCom Content (4) updates to show the button definitions for the station.

Each button can call another InterCom station, ANSWER any call or perform no function (OFF). Having set the functions from the **Nr** field, the **Name** automatically updates.

If you check the **Gr** box, then the button can talk to a group of stations as defined below.

### 5 Group

In this area you can define a group of InterCom stations. For example, if you group all InterCom stations together, then a single button can talk to All.

Each group is given a unique number (Nr) and a Name (up to 6 characters).



### 6 Group Content

Double-click on an entry from the Group list (5) and the Group Content (6) updates to show the group definitions. Each group can contain any number of InterCom stations from the InterCom list (3).

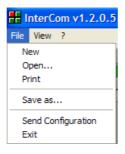
Having defined a group, return to the InterCom Content area (4), tick the Gr checkbox, and then select the group number from the Nr field.

7 Status Bar

Status messages appear here.

### 5.4.5 The Main Menus

### File



- New creates a new InterCom configuration.
- Open... opens an existing InterCom configuration. This file is saved as a .mdb file.
- **Print** prints a list of the InterCom setup.
- Save as.. use this option to save the database under a different file name.
- Send Configuration transfers the InterCom configuration to an online system.
- **Exit** quits the InterCom application.

### View

From the View menu, you can select to display, or not display, the toolbar and/or status bar.

### Help

The Help menu provides information about the InterCom software release, and your computer (System-Info).



## 5.4.6 Creating a New Configuration

1. Select File -> New from the main menus to create a new configuration.

You are asked to choose a location for the InterCom database file:

File new	Sector 2018	K
Save in:	🔁 Configs_Used_for_Manuals 💽 🗢 🖻 📸 -	
My Recent Documents Desktop My Documents My Computer	<ul> <li>kpf</li> <li>trc</li> <li>Configuration_nova29_ICOM_example.mdb</li> <li>Configuration_nova29_ICOM_example_with_3_KSC_Panels.mdb</li> <li>grystal_4fader_Edit_before_convert.mdb</li> <li>grystal_4fader_Edit_before_convert.mdb</li> <li>InterCom_nova29_example.mdb</li> <li>Nova29 Configuration.mdb</li> <li>VisToolExample.mdb</li> <li>Zirkon Std Configuration.mdb</li> <li>Zirkon Std Configuration_before_convert.mdb</li> <li>Zirkon_Z_7_Net_Assign.mdb</li> <li>ZirkonXLConfigExample_before_convert.mdb</li> </ul>	
My Network Places	File name: intercom Save	ן
	Save as type: Microsoft Access Database (*.mdb)	

2. Enter a file name and select **Save**.

The database is saved and a blank operating window appears:

ee Ir	nterCo	Com v1.2.0.5 - C:\Program Files\Lawo\InterCom\InterCom.mdb			_ @ 🛛
File					
inter	4	9			
Inter	iom i		InterCom Content No:0:		
	Nr	Name Typ	InterCom Content No:0:           Taste         Gr           Nr         Name		
*					
Group	)		Group Content No:0 :		
	Nr	Name	Nr Name		
*			*		
Statu	·			23/06/2010	11:28



## 5.4.7 Adding the InterCom Stations

1. In the InterCom area (top left), double-click on the first empty **Nr** field to enter a new InterCom station - the cursor flashes.

2. Enter a number.

The **Nr** must match the unique <u>Identifier</u> which you defined earlier within the system configuration for the InterCom element. In our example, 1 is Studio 1, 2 is Studio 2 and so on.

3. Then click on the **Name** field and type in a name for the InterCom station.

This name is used within the other areas of the InterCom operating window to help identify the InterCom station. You can enter up to 6 characters:

InterCom				
	Nr	Name	Тур	
I	1	St 1		
*				

4. Next click on the **Typ** field and make a selection from the drop-down menu:

InterCom				
	Nr	Name	Тур	
I	1	St1		
*			Name	
			no keys	
			Silence Detect	
			16 Keys	
			32 Keys	
			8 Keys	

This selection determines how many buttons can be defined within the InterCom Content area. The options are predefined by the software. If both the Intercom Client and Server are a Power Core, then you can have up to 48 Keys. In all other instances, up to 32 Keys are supported.

5. Repeat steps 1 to 4 for each InterCom station:

InterCom				
	Nr	Name	Тур	
	1	St1	T8	
$\mathbf{F}$	2	St 2	T16	
	3	St 3	T8	
*				



### 5.4.8 Defining the InterCom Content

1. Double-click on an InterCom station (top left) to view its button definitions (top right).

The name of the selected station is shown at the top of the InterCom Content area (in green). The number of buttons which may be defined is governed by the **Typ** which you selected earlier – in our example, **T16**:

nterC	om			Inter	Com Content	No:2 : St 2		
	Nr		Тур		Taste	Gruppe	Nr	Name
	1	St1	T8		1		[ 1 📃	OFF
	2	St 2	T16		2		-1	OFF
	3	St 3	T8		3		-1	OFF
¥					4		-1	OFF
					5		-1	OFF
					6		-1	OFF
					7		-1	OFF
					8		-1	OFF
					9		-1	OFF
					10			OFF
					11		-1	OFF
					12		-1	OFF
					13			OFF
					14			OFF
					15			OFF
					16		-1	OFF

Each button can call another InterCom station, answer any incoming call, call a group of InterCom stations or perform no function. First let's define a button to call a specific station. See <u>Using Groups</u>, for more details on groups.

2. Click on the Nr field for the button you wish to define, and select a function from the drop-down menu - the options are:

- -1 (OFF) performs no function.
- 0 (ANSWER) answers any incoming call.
- 1, 2, 3, etc. calls another InterCom station.

Inter	Com Content	No:2 : St 2				
	Taste	Gruppe	Nr		Name	
I	1		[-1	-	OFF	
	2		ID	Name		
	3		-1	OFF		
	4		0	ANSWER		
	5		1	St 1		
	6		2	St 2		
	7		3	St 3		
	8					
	9					
	10					
	11					
	12					
	13					
	14					
	15		-1		OFF	
	16		-1		OFF	

Once selected, the Name field updates automatically.

You can also drag and drop an InterCom station (from the left tab) onto a button (on the right tab).



3. Repeat for each button of each InterCom station – for example:

Define St 1:

lr	erCom		
	Nr	Name	Тур
	• 1	St1	T8
	2	St 2	T16
	3	St 3	T8
1	÷		



Inte	Com			Inter	Com Content	No:2 : St 2		
	Nr	Name	Тур		Taste	Gruppe	Nr	Name
	1	St 1	T8	$\mathbf{F}$	1		1	St 1
►	2	St 2	]T16		2		3	St 3
	3	St 3	T8		3		0	ANSWER
*					4		-1	OFF
					5		-1	OFF
					6		-1	OFF
					7		-1	OFF
					8		-1	OFF
					9		-1	OFF
					10		-1	OFF
					11		-1	OFF
					12		-1	OFF
					13		-1	OFF
					14		-1	OFF
					15		-1	OFF
					16		-1	OFF
							•	· · · · · · · · · · · · · · · · · · ·

Define St 3:

In							InterCom Content No:3 : St 3					
	Nr	Name	Тур			Taste	Gruppe	Nr	Name			
	1	St1	T8			1		1	St1			
	2	St 2	T16			2		2	St 2			
	3	St 3	]T8			3		0	ANSWER			
)	÷					4			OFF			
						5		-1	OFF			
						6		-1	OFF			
						7			OFF			
						8		-1	OFF			

## 5.4.9 Saving and Transferring the InterCom Configuration

The InterCom configuration is automatically saved into the file path you entered earlier when you close the application. If you wish to create different InterCom setups, you can use **File** -> **Save As** to save the database under a different file name.

To make the InterCom configuration active, it must be transferred to the system via TCP/IP. The configuration is then stored on the control system and loaded whenever the system powers on.

You can transfer a new InterCom configuration without restarting the system. This allows you to modify InterCom functions while the system is running online.

1. First make sure that your **InterCom** PC is connected and communicating with the system you wish to transfer to.

- 2. Then check that you have <u>transferred</u> the system configuration which supports your InterCom setup.
- 3. Select File -> Send Configuration to transfer the current InterCom configuration to the system.
- 4. Once the transfer is complete, test your InterCom setup.



## 5.4.10 Using Groups

Any number of InterCom stations can be grouped together, allowing a single button to call more than one station.

#### > To Create a Group

1. In the Group area (bottom left), double-click on the first empty **Nr** field to enter a new Group number - the cursor flashes.

2. Enter a unique number.

This number will be used to reference the group within the InterCom operating window.

3. Then click on the **Name** field and type in a name for the InterCom station.

You can enter up to 6 characters.

#### > Defining the Group

- 1. Double-click on the Group (bottom left) to view its definition (bottom right).
- 2. Click on the first empty **Nr** field and select the first InterCom station you wish to group:

	ârou	P				Grou	p Content	No:1 : ALL		
		Nr	Name				Nr	Name		
		1	ALL	]		$\mathbf{F}$	h.	🛨 ST 1	_	
	*						ID	Name		
1							-1	OFF		
II.						*		ANSWER		
II.								ST 1		
II.								ST 2		
н							3	ST 3		
н										
н										
н										
н										
н										
н										
н										

Once selected, the Name field updates automatically.

3. Repeat to select all the stations for the group. Our example shows a group named ALL which contains Studio 1, Studio 2 and Studio 3.

Grou	IP		Group Content No:1 : ALL					
	Nr	Name		Nr	Name			
	1	ALL		1 🚽	ST 1			
*					ST 2			
				3	ST 3			
			*					



### > Configuring the Group Button

1. Return to the InterCom Content area and tick the **Gr** checkbox beside the button you wish to use to call the group.

2. Click on the Nr field, and the drop-down menu now lists all available groups – select the group (e.g. ALL) from the list:

Inte	rCom Content	No:1 : ST 1					
	Taste	Gruppe	Nr		Na	me	
	1		2		ST	2	
	2		3		ST	3	
J	3		[h	-	ALI	L	
	4		ID	Name		3WER	
	5		1	ALL			
	6					-	
	7						
	8						
			1				
				1		1	
					•		

The group definition is now complete. In our example, we have modified the Studio 1 InterCom station so that it has 4 active buttons:

- **1** call Studio 1.
- **2** call Studio 2.
- ALL call the group ALL (Studios 1, 2 and 3).
- **ANSWER** answers any incoming call.

Inter	Com			Inter	Com Content	No:1 : ST 1			
	INL	Name	Тур		Taste			Name	
$\mathbf{F}$		ST 1	T8		1			ST 2	]
		ST 2	T8		2			ST 3	
	3	ST 3	T8	J	3			ALL	
*					4			ANSWER	
					5			OFF	
					6			OFF	
					7			OFF	
					8		-1	OFF	
Grou	p				p Content No				
*	Nr 1	Name ALL		•	1 – 2	Name ST 1 ST 2 ST 3	_		
				*	5	51.5			

**3.** Transfer the InterCom configuration to the system using <u>File -> Send Configuration</u> to make the groups active.



# 6. Macros

This chapter describes the Macros system.



## 6.1 Introduction

Macros are supported by **sapphire MK2** and **Power Core** systems. They can be used to action a series of complex functions, or to interchange functions between systems.

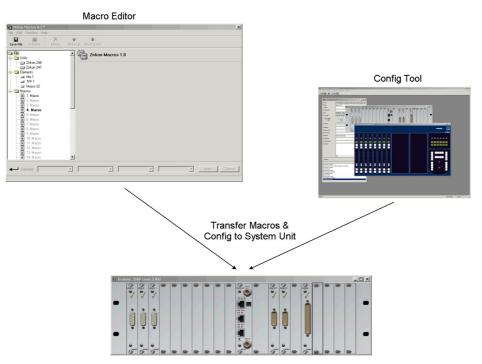
Each macro can operate any element defined within the system configuration; up to 32 macros may be operated from each console at any one time. To trigger a macro, it is assigned to a logic element such as an MF Key, GPI, etc. Thus, it is possible to execute multiple operations at the push of a button.

Macros are assembled using the **Macro Editor**. The program allows you to define "macro sets", each consisting of 32 macro definitions. You may create different macro sets for different types of work - for example On Air, Recording, etc. At any time, you can transfer a macro set to any system within your studio network, where it is stored separately from the system configuration and loads on boot up.

In **sapphire MK2** systems with a redundant Master Board, then the macro definitions must be transferred to both Master Boards.

You can transfer a new macro set without restarting the system. This allows you to modify macros while the system is running online.

The **Macro Editor** serves exclusively for the definition of macros; it does not provide the actual functions. Each macro is referenced to elements within the system configuration. Thus, macros can only be executed when loaded to a console with the corresponding system configuration.





## 6.2 System Configuration

Before you can use the **Macro Editor** software, you must edit the system's configuration. There are two parts to the configuration. First, define a **Macro** element to assign the triggering logic for the 32 macros. Then, configure the functions which will be assembled into each macro.

## 6.2.1 Defining the Macro Logic

Each system supports a single Macro element which must be added to the "Logic" branch of the 'Tree Definition'.

For each of the 32 macros, you can assign two control inputs: one for the rising and one for the falling edge. The control inputs can be any logical signal – for example, an MF Key on the control surface, an MF Key within VisTool, a GPI, etc.

			🛛			
🔨 General						
Macro	Macro 32		-			
1 Rising Edge	indoite de	1 Falling Edge				
2 Rising Edge		2 Falling Edge				
Contraction To the Test						
24 Rising Edge		24 Falling Edge				
me for the ele	ment.					
ntrol input whi	ch will trigger	the macro's rising edge.				
ontrol input which will trigger the macro's falling edge.						
	Macro 1 Rising Edge 2 Rising Edge 3 Rising Edge 4 Rising Edge 5 Rising Edge 5 Rising Edge 7 Rising Edge 10 Rising Edge 10 Rising Edge 11 Rising Edge 12 Rising Edge 13 Rising Edge 14 Rising Edge 15 Rising Edge 17 Rising Edge 18 Rising Edge 19 Rising Edge 20 Rising Edge 21 Rising Edge 22 Rising Edge 23 Rising Edge 23 Rising Edge 24 Rising Edge 24 Rising Edge 24 Rising Edge 25 Rising Edge 26 Rising Edge 27 Rising Edge 27 Rising Edge 28 Rising Edge 29 Rising Edge 20 Rising Edge 20 Rising Edge 20 Rising Edge 20 Rising Edge 21 Rising Edge 22 Rising Edge 23 Rising Edge 24 Rising Edge 24 Rising Edge 25 Rising Edge 26 Rising Edge 26 Rising Edge 27 Rising Edge 28 Rising Edge 29 Rising Edge 20 Rising Edge	Macro       Macro 32         1 Rising Edge       1         2 Rising Edge       1         3 Rising Edge       1         4 Rising Edge       1         5 Rising Edge       1         9 Rising Edge       1         10 Rising Edge       1         11 Rising Edge       1         12 Rising Edge       1         13 Rising Edge       1         14 Rising Edge       1         15 Rising Edge       1         16 Rising Edge       1         17 Rising Edge       1         18 Rising Edge       1         19 Rising Edge       1         10 Rising Edge       1         12 Rising Edge       1         13 Rising Edge       1         14 Rising Edge       1         15 Rising Edge       1         16 Rising Edge       1         17 Rising Edge       1         18 Rising Edge       1         20 Rising Edge       1         21 Rising Edge       1         22 Rising Edge       1         23 Rising Edge       1         24 Rising Edge       1         24 Rising Edge       1 </th <th>MacroMacro 321 Rising Edge1 Falling Edge2 Rising Edge2 Falling Edge3 Rising Edge3 Falling Edge4 Rising Edge4 Falling Edge5 Rising Edge5 Falling Edge6 Rising Edge6 Falling Edge7 Rising Edge8 Falling Edge9 Rising Edge9 Falling Edge9 Rising Edge9 Falling Edge10 Rising Edge10 Falling Edge11 Rising Edge10 Falling Edge12 Rising Edge11 Falling Edge13 Rising Edge13 Falling Edge14 Rising Edge13 Falling Edge15 Rising Edge15 Falling Edge16 Rising Edge16 Falling Edge17 Rising Edge17 Falling Edge18 Rising Edge18 Falling Edge19 Rising Edge19 Falling Edge11 Rising Edge11 Falling Edge12 Rising Edge13 Falling Edge13 Rising Edge14 Falling Edge14 Rising Edge16 Falling Edge15 Rising Edge17 Falling Edge17 Rising Edge19 Falling Edge18 Rising Edge19 Falling Edge19 Rising Edge19 Falling Edge20 Rising Edge20 Falling Edge21 Rising Edge21 Falling Edge22 Rising Edge22 Falling Edge23 Rising Edge23 Falling Edge24 Rising Edge24 Rising Edge25 Rising Edge24 Falling Edge</th>	MacroMacro 321 Rising Edge1 Falling Edge2 Rising Edge2 Falling Edge3 Rising Edge3 Falling Edge4 Rising Edge4 Falling Edge5 Rising Edge5 Falling Edge6 Rising Edge6 Falling Edge7 Rising Edge8 Falling Edge9 Rising Edge9 Falling Edge9 Rising Edge9 Falling Edge10 Rising Edge10 Falling Edge11 Rising Edge10 Falling Edge12 Rising Edge11 Falling Edge13 Rising Edge13 Falling Edge14 Rising Edge13 Falling Edge15 Rising Edge15 Falling Edge16 Rising Edge16 Falling Edge17 Rising Edge17 Falling Edge18 Rising Edge18 Falling Edge19 Rising Edge19 Falling Edge11 Rising Edge11 Falling Edge12 Rising Edge13 Falling Edge13 Rising Edge14 Falling Edge14 Rising Edge16 Falling Edge15 Rising Edge17 Falling Edge17 Rising Edge19 Falling Edge18 Rising Edge19 Falling Edge19 Rising Edge19 Falling Edge20 Rising Edge20 Falling Edge21 Rising Edge21 Falling Edge22 Rising Edge22 Falling Edge23 Rising Edge23 Falling Edge24 Rising Edge24 Rising Edge25 Rising Edge24 Falling Edge			

#### **General Parameters**



For each of the 32 macros, there are four logic outputs: red, green, yellow and blink. These can be found under the "Logic -> <GroupName> -> Macro" branch of the 'Tree Selection' window. They can be used to signal the status of the macro - for example, to illuminate the MACRO MF Key:

UE OF	-		11/////			1000	Keys 4546 VC	
MF 25	MACRO 1							
P1 Color	green	🚽 Lo	w [	Bli	nk		Logic	
P2 Color	yellow		w [	Bli	nk		Logic	
P3 Color	red	🚽 Lo	w [	Bli	nk		Logic	Macro 32.1 Red
P4 Color	black.	🚽 Lo	w [	Bli	nk		Logic	++ Treeselection
P5 Color	black.	🚽 Lo	w [	Bli	nk		Logic	
P6 Color	black	🚽 Lo	w [	Bli	nk	<b>m</b>	Logic	GPI/O
P7 Color	black.	🚽 Lo	w [	Bli	nk		Logic	E * Aux Bus
P8 Color	black		w [	Bli	nk		Logic	i∰* Clipboard I∓* Const
MF 26	MACRO 2							Desk
P1 Color	green	🚽 Lo	w	Bli	nk		Logic	
P2 Color	yellow	🚽 La	w	Bli	nk		Logic	
P3 Color	red	🚽 La	w	Bli	nk		Logic	1 Yellow 1 Blink
P4 Color	black	🖵 La	w [	Bli	nk		Logic	2 Red
P5 Color	black	🚽 La	w [	Bli	nk		Logic	2 Green 2 Yellow
P6 Color	black	🚽 Lo	w [	Bli	nk		Logic	2 Blink
P7 Color	black	↓ La	w [	Bli	nk		Logic	3 Red 3 Green
P8 Color	black	_ Lo	w I	n Bli	nk		Logic	3 Yellow

The logic control outputs can trigger any configuration element, not just MF Key lamps.

## 6.2.2 Configuring the Macro Functions

The next step is to insert and name all of the elements which will be executed as part of each macro definition. The elements can then be assembled into macros <u>later</u> using the **Macro Editor** software.

The **Macro Editor** references the configuration elements by their name and type. Therefore, you should give each element a unique name - for example:

# Treedefinition: Logic / * Desk / TFF	
	General TFF TFF_1 Toggle Reset Static Reset Pos Edge Set Pos Edge

Elements can be controlled from macros and other control signals if required.

Some elements cannot be renamed. For example, the Central Module within the 'Surface' branch of the 'Tree Definition' window. See <u>Configuring Elements without a Name</u> for more details.



## 6.2.3 Transferring the System Configuration

Having configured the logical control inputs for your macros (via the Logic -> Macro element) and the functions themselves, you should now save and transfer the configuration to the Lawo system.



## 6.3 Installing the Macro Editor

## 6.3.1 System Requirements

### Macro Editor PC

To install and run the Macro Editor, your computer MUST meet or exceed the following requirements:

- Operating System: Windows XP Professional SP3 or Windows 7 Ultimate. Note that Windows 10 LTSB (Long Term Servicing Branch) for Enterprise installations is not supported.
- Processor: Intel<sup>™</sup> Core i3 530 (or higher equivalent processor).
- Random access memory (RAM): 2GB
- Ethernet interface: 100MBit/s

The **Macro Editor** software serves exclusively for the definition of macros and their transfer to consoles; it does not provide the actual functions and it is not required for operation.

### Lawo System

The Lawo system MUST be running OS Version 2.7 software or higher.

You can check the OS version using the Web UI.

If the OS-Version is lower than 2.7, please contact your local Lawo representative or email <u>support@lawo.com</u>. **crystal** and **Nova29** systems do not support Macros.

### Network

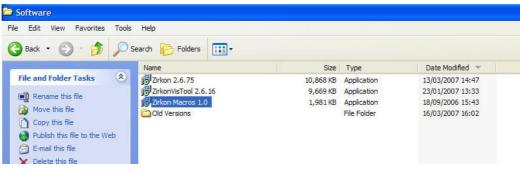
You should connect the **Macro Editor** PC to the Lawo control system either directly or via a network switch. *Do NOT* use an Ethernet hub as this will interrupt the data stream. See Wiring: CONTROL Network.



## 6.3.2 Installation Procedure

The **ZirkonMacros.exe** setup application, included with your system, performs an automatic install of the **Macro Editor** software:

- 1. Copy the **ZirkonMacros.exe** application onto your computer.
- 2. Double click on the **ZirkonMacros.exe** application icon:



This starts the 'ZirkonMacros Setup Wizard':



- 3. Follow the Wizard's instructions accepting the default options provided.
- 4. When you reach the 'Summary' window, check the options and click Install.

The software is installed onto your computer; this may take a few minutes. By default, files are installed in the location: 'C:\Program Files\Zirkon'.

- 5. When the installation is complete, a confirmation window appears.
- 6. Click on Finish to exit the 'Setup Wizard'.

If you have any problems with the software installation, please contact your local Lawo representative or email <a href="mailto:support@lawo.com">support@lawo.com</a>.



## 6.4 Using the Macro Editor

The **Macro Editor** is used to assemble the macro definitions and then transfer them to each system. Five steps are required:

1. Configure the Lawo system(s) so that the Macro Editor can communicate via the TCP/IP network.

2. Add the elements you wish to include within your macro definitions. The element type and name must match those created within the system configuration earlier.

**3.** Create the "macro sets".

Each macro set consists of up to 32 macro definitions. You can create multiple macro sets if you wish – for example, you may have one set of macros suitable for live work, a different set for offline recording, etc.

- 4. Within each macro set, define the macros 1 to 32.
- 5. Transfer the macro set to the system(s) you configured in step 1.

### 6.4.1 Operating Principles

#### 1. Start the Macro Editor, by selecting START -> Program Files -> Zirkon -> Zirkon Macros:

If this is the first time you have run the software, then you will open a new file. If you have already been using the Macro Editor, then the last file you saved from the software is automatically opened for you.

In either case, the Macro Editor window consists of four operating areas:

Main Menus	Tirkon Macros 0.7 - [C:\Docu       File     Edit. Help       Save     Transfer       Delete	ments and Settings\Sue Mcdonald\My Docu	ments\Documentation & T
Selection Area		AMP Studio 5 Address: 192 168.2.5 Description: AMP Studio 5	
Data Entry Area		Ap	Dly Cancel

### 1 Main Menus

File, Edit and Help main menus.

### 2 Toolbar

Quick access to common functions such as Save, Transfer, Delete, Move Up and Move Down.

### **3** Selection Area

This area operates very much like the 'Tree Definition' window within the system configuration.

Each of the tree's branches may be opened to select a component. Double-click on the tree branch, or click on the + sign, to open up a branch. Click on the – sign to close the branch and return to the top navigation level. The Selection Area contains three types of component:

- Units open this branch to view or add units to your network.
- **Elements** open this branch to view or add the system configuration elements which may be included within a macro definition.
- Macrosets open this branch to view or add a macro set, and the individual macros.

### 4 Data Entry Area

When you open up a branch of the tree and select a component - for example the unit called **AMP\_Studio\_5** - the data entry area comes to life. This is where you can program the parameters for the selected component. In our example, the TCP/IP address and description of the unit.



## 6.4.2 The Main Menus

### File

Edit Help w	
ven	Ctrl+c
ve	Ctrl+5
ve as	
C:\Documents and Settings\Sue Mcdonald\My Documents\Documentation Training\Lawo - All Documentation\Zirkon	Nova17\Zirkon Configurations\Configs_for_Manual\ZirkonMacros.zmc

Use the **File** menu options to create a **New** macro file, **Open** an existing configuration, **Save** a configuration or **Exit** (Quit) the Macro Editor software.

### Edit

idit Help	
Cut Ctrl+X Copy Ctrl+C Paste	Delete Move Up Move Down
Create  Rename	Unit Element
Macrosets	Macroset

Use the Edit menu to access the following functions:

- Cut, Copy and Paste you can copy and paste units, elements and/or macro sets to help speed up your programing.
- Create adds a Unit, Element or Macroset to the configuration.
- Rename renames your current selection.

### Help

The Help menu provides information on the current release version of the Macro Editor software.



## 6.4.3 Configuring the Units

The **Macro Editor** transfers macro definitions to each system via TCP/IP network. Therefore, the first step when creating a new configuration is to define the name, IP address and description of each unit:

1. Open up the **Units** branch within the Selection Area on the left of the display to view the units.

If this is a new configuration you will see a single unit called **Zirkon** with the default IP **Address** and a default **Description**.

2. To change the name of the unit, right-click on the existing name and select **Rename**:

🕲 Zirkon Macros	0.7 - [ZirkonMacros.	zmc]*		
File Edit Help				
Save Transfe	er Delete Move	Up Move Down		
<b>ZirkonMacros</b>   Units		<b>Zirkon</b>		
Elements	Cut Ctrl+X Copy Ctrl+C Paste ▶	Address: 192.168.101.240 Description: Default Unit		
	Create  Rename Delete		<u></u>	
	Transfer	ļ	Apply Cancel	
Function:	<u>*</u>	<u> </u>	<u>*</u>	Apply Cancel
🗐 (none) 🚺 🧰 ra	ad78346.tmp			

3. You can now type a new name and press Enter.

4. Edit the IP Address to match that of your unit within the Parameter Area, and change the **Description** if you wish.

5. After making changes with the Parameter Area click on **Apply** to adopt the new settings.



6. If you wish to add more units, then right-click anywhere within the Selection Area, and select Create and Unit:

Cirkon Macros 0.7 - [ZirkonMacro	s.zmc]*	
File Edit Help		
Save Transfer Delete Mov	s Up Move Down	
SirkonMacros (NEW)	Zirkon Macros 0.7	
Elements Copy Ctrl+C		
Create  Rename	Unit Element	
	Macroset	
Function:		Apply Cancel
🔟 (none) 👔 🦳 rad78346.tmp	, , , ,	

A New Unit is added to the Units branch. You can now edit its name, IP Address and Description as above:

Tirkon Macros 0.7 - [ZirkonMacros	s.zmc]*	
File Edit Help		
Save Transfer Delete Move	s Up Move Down	
SirkonMacros (NE₩) → → Units → → Zirkon 1	Zirkon 2	
	Address: 192.168.101.241 Description: Studio 2	
	Apply Cancel	
Function:		Apply Cancel
🔟 (none) 👔 🧰 rad78346.tmp		

7. Repeat for all the units on your network.



## 6.4.4 Configuring the Elements

Each macro definition actions the elements you programed <u>earlier</u> within the system configuration. Therefore, the next step is to create a list of these under the **Elements** branch within the Macro Editor.

All elements to be used within macros *MUST* be entered here. If not, they cannot be referenced to the system configuration.

1. Open up the **Elements** branch within the Selection Area on the left of the display to view the elements:

🖥 Zirkon Macros 0.7 - [ZirkonMacı	s.zmc]*		
File Edit Help			
Save Transfer Delete Mo	e Up Move Down		
CirkonMacros (NE₩) ⊕ — Units	Key XY		
Elements	Description: Default Entry	~	
	PasisTurasi I	~	
	BasisTypes: 0 60 Key Modul V AND8 V Button 16 V Button 64 V Central Modul V Definition V GPIO Card V Key Panel KS V Key Panel KS		
		None	Apply Cancel
Function:		<u> </u>	Apply Cancel
🖽 (none) 👔 🧰 rad78346.tmp			

If this is a new configuration, as in our example, you will see a dummy entry called **KeyXY**. You will need to create a new entry for every element which you wish to be controlled by a macro.

2. To add a new element right-click anywhere within the Selection Area, and select **Create** and **Element**.

A New Element is added to the Elements branch:

🔏 Zirkon Macros 0.7 - [ZirkonMacros	s.zmc] *	
File Edit Help		
Save Transfer Delete Move	e Up Move Down	
TirkonMacros (NEW)	New Element	
	Description:	
	BasisTypes: 60 Key Modul Minimix AND8 OR 32 Button 16 OR8 Button 16 Source Central Module Sum Definition TFF GPI0 Card XL Key Panel KEY Key Panel KS Macro	
	All None Apply	Cancel
Function:	Apply	Cancel
🔟 (none) 🜘 🦳 rad78346.tmp		



- 3. To name the element, right-click on the existing name and select **Rename**.
- 4. Type the name of the element and press Enter.
- 5. Within the Parameter Area, tick the checkbox which describes the type of the element e.g. TFF.

The **Macro Editor** references each element by name and type. Therefore, these *MUST* match those given within the system configuration, see <u>Configuring the Macro Functions</u>.

- 6. Enter a **Description** for the element if you wish.
- 7. Having made changes within the Parameter Area, click on **Apply** to adopt the changes:

Zirkon Macros 0.7 - [ZirkonMacros	s.zmc] *	
File Edit Help		
Save Transfer Delete Move	s Up : Move Down	
ZirkonMacros (NEW)	TFF_1	
Elements     Key XY     TFF_1     Macrosets	Description: Toggle Flip Flop	
	BasisTypes:         60 Key Modul         Minimix           AND8         0R 32           Button 16         0R8           Button 64         Source           Central Module         Sum           Definition         TFF           GPI0 Card         XL           Key Panel KEY         Key Panel KS           Macro         Key Panel Key	
Function:	All None Apply	Cancel

8. Repeat steps 2 to 7 for every element you wish to include within a macro definition.

9. You can delete unwanted elements, such as the dummy **KeyXY** entry by right-clicking and selecting **Delete**:

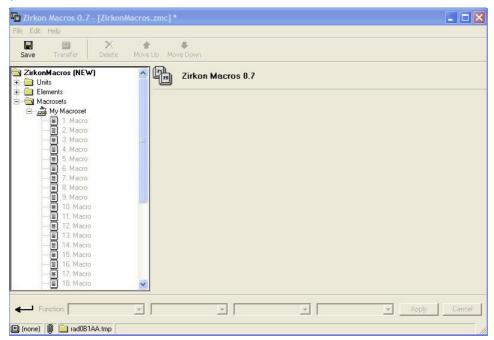
Zirkon Macros 0.7 - [Zirkor	nMacros.zmc]*		
File Edit Help	Move Up Move I		
Create Rename Delete	+X Description:		
		All None	ApplyCancel
Function:	<u>*</u>	<u>×</u>	Apply Cancel



## 6.4.5 Creating a Macro set

The next step is to create a macro set. Each macro set can be named and consists of 32 macro definitions. For example, you may create different macrosets for different types of application such as Live or Recording work. This provides the ability to transfer different macro sets to different studios for any given production.

1. Open up the Macrosets branch within the Selection Area to view the macro sets:



If this is a new configuration you will see one Macro set named My Macroset.

2. Double-click on the name or click on the + sign to view the 32 individual Macros.

There are a few options for each macro set:

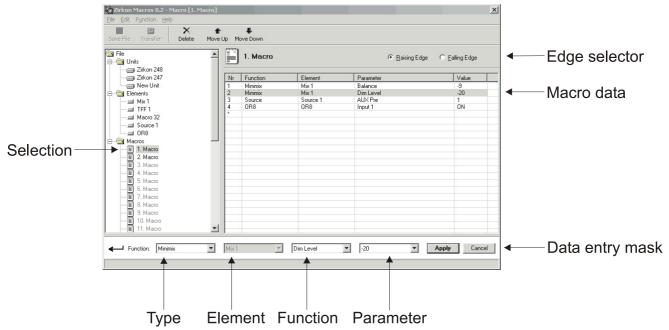
- To change the name of the macro set, right-click the name and select Rename.
- Then type in the new name for example, Live Macros and press Enter.
- You can enter a **Description** in the Parameter Area, if you wish, and also click the **Set Default** button. This makes this macro set the default selection when <u>transferring macros</u> later.
- Having made changes in the Parameter Area, click on **Apply** to adopt the changes.



## 6.4.6 Defining the Macros

Having configured your macro set and added all the elements you need to the **Macro Editor**, you are now ready to define your macros.

The example below shows a programed macro – **Macro 1** – which will execute 4 functions on the Rising edge of the triggering logic:



Within the Macro data area you can see the 4 element functions which will be triggered:

- Mix 1 Balance set to -9
- Mix 1 Dim Level set to -20
- Source 1 routed to Aux Pre 1
- Input 1 of the OR8 gate turned ON.

The Edge selector shows that these elements will occur on the Rising Edge of the macro.

The **Data entry mask area** can be used to edit any of the individual entries within the Macro data list. For each function, you can set the:

- **Type** this is the element type, in our example a Minimix. Click on this field to view all the element types which can be included within a macro.
- Element this is the element name, in our example the Minimix called Mix 1. The options here come from the Elements branch of the Macro Editor.
- Function this is the function within the element, in our example, the Dim Level within the Minimix. The options available here depend on the type of element.
- **Parameter** this is the parameter value which will be actioned, in our example, the level will change to 20dB. The parameter options also depend on the type of element.



> To program a new macro from scratch:

- 1. Open up your macro set within the Selection Area to view the 32 individual Macros.
- 2. Select a macro e.g. 1 Macro:

Save Transfer Delete ZirkonMacros (NEW) Units	Move Up	Move Down		@ <u>B</u>	ising Edge 🦳 🤉 Falling Edg
		r Function	Element	Parameter	Value

3. Select **Rising Edge** from the Edge Selector to define what will happen when the macro's rising edge is triggered.

4. Highlight the first row within the Macro Data area. This will be marked with an \*.

The Function fields within the Data Entry Mask area now become active for you to define your macro.

5. First select the type of element – for example, **Source**:

ZirkonMacros (NEW) 		1. Macro		• <u>B</u> i	sing Edge 🦳 🤉 Falling Edg
Honords     Key XY     Kix 1     Source 1     Macrosets     Live Macros     A Macro     A Macro     A Macro     B Macro		Function	Element	Parameter	Value
- 14. Macro	-				



6. Then the name of the element – for example, **Source 1**:

ZirkonMacros (NEW)       I. Macro         Units       Key XY         Key XY       Image: Source 1         Source 1       Image: Source 1         Macrosets       Image: Source 1         Image: Source 1       Image: Source 1         Macrosets       Image: Source 1         Image: Source 1       Image: Sou	ge C Falling Edg
Key XY     Mix 1     Source 1     Macrosets	Value
3. Macro                 10. Macro                 11. Macro                 12. Macro                 13. Macro                 13. Macro                 13. Macro                    13. Macro   13. Macro	

7. Now select a Function within the Source 1 element – for example, Fader Up/Down:

	-				
File Edit Help					
	re Up IN	Uove Down			
ZirkonMacros (NEW)		1. Macro		@ <u>B</u>	ising Edge 🛛 🤉 Falling Edge
Elements	Nr	Function	Element	Parameter	Value
	×		7	1	
Source I					
🖻 🚵 Live Macros					
I. Macro           I. J. Macro					
E 3. Macro					
🔳 4. Macro					
5. Macro					
- I Acro					
8. Macro					
🗐 15. Macro 🗸					
					20 10 10
- Function: Source	Sourc	e1 💌	Fader Up / Down	ON ON	▼ Append Cancel
🔟 Live Macros 👔 🦳 rad0B1AA.tmp	1150				



**8.** Finally, select the Parameter value which you wish to occur. In our example, we want the fader to open (turn **ON**) on the rising edge of the macro:

ZirkonMacros (NEW)       I. Macro       I. Bising Edge       Falling E         Units       I. Macro       I. Bising Edge       Falling E         Elements       I. Macro       Value         Mix 1       Source 1       I. Macrosets       I. Macrosets	ile Edit Help	♠ ♣ Move Up Move Down			
KeyXY     Nr     Function     Element     Parameter     Value       Mix 1     *     *     *     *       Source 1     *     *     *	- 🧰 Units	1. Macro			ing Edge 🛛 🤅 Fajling Edge
- 🖺 13. Macro 🗐 14. Macro 📕 15. Macro	Key XY Mix 1 Source 1 Macrosets 1. Macrosets 2. Macro 4. Macro 4. Macro 4. Macro 4. Macro 4. Macro 4. Macro 4. Macro 4. Macro 1. Macro		Element	Parameter	Value

**9.** When you have made your selections, click on **Append** to add the function to the macro definition. The function is automatically entered in the next available position – in our example, position 1:

Zirkon Macros 0.7 - [ZirkonMacro	s.zmc]	*			
File Edit Help					
Save Transfer Delete Mov	T.0	Uove Down			
CarkonMacros (NEW) ▲ ⊕ Units → Elements		1. Macro		☞ <u>B</u> ising	Edge C Falling Edge
Elements	Nr	Function	Element	Parameter	Value
<b>Mix</b> 1	1	Source	Source 1	Fader Up / Down	ON
Source 1	×				
Macrosets     A Live Macros	-				
3. Macro					
🗐 4. Macro					
5. Macro					
6. Macro					
🗃 9. Macro					
🗑 10. Macro					
11. Macro					
- 4 . Macro - 9 . Macro					
14. Macro					
🗐 15. Macro 🗸 🗸					
The second					
- Function: Source	Sourc	e1 🔻	Fader Up / Down	• ON •	Append Cancel
	n <b>k</b> onstationst	1973-839 d		Canad Reserve	
🛄 Live Macros 👔 🧰 rad0B1AA.tmp					1

**10.** Now click on **Falling Edge** within the Edge Selector to define what will happen when the macro's falling edge is triggered.



**11.** Repeat steps 4 to 10 for every function you wish to be actioned from this macro.

When you finish, you should have a list of functions programed for the macro – for example:

🛱 Zirkon Macros 0.2 - Macro [1. Macr	o]				x
Eile         Edit         Function         Help           Save File         Transfer         Delete         M	nt oveUp M	Uniove Down			
File		1. Macro		€ <u>B</u> aising	Edge 🔿 <u>F</u> alling Edge
Zirkon 240	Nr	Function	Element	Parameter	Value
New Unit	1	Minimix	Mix 1	Balance	-9
Elements	2	Minimix	Mix 1	Dim Level	-20
Mix 1	3	Source	Source 1	AUX Pre	1
TFF 1	4	OR8	OR8	Input 1	ON
Macro 32	<u>^</u>				
Source 1					
OR8					
Macros     Macro     10 Macro     12 Macro     13 Macro     10 Macro     11 Macro     11 Macro     11 Macro					
2. Macro					
3. Macro					
Hadro					
E 6 Macro					
T Macro			2		
9. Macro					
10. Macro					
11. Macro	-				
Function: Minimix	Mix 1	<b>T</b>	Dim Level	-20	Apply Cancel

The functions will be actioned in the order in which they appear.

#### > To reorder the list:

1. Select the macro function – e.g. Mix 1 Dim Level.

2. Click on the **Move Up** or **Move Down** buttons on the Macro Editor Toolbar to change its position within the list.

#### > To delete a function:

- **1.** Select the macro function e.g. Mix 1 Dim Level.
- 2. Right-click and select **Delete**.
- 3. Or, select **Delete all** to delete all functions from the macro.

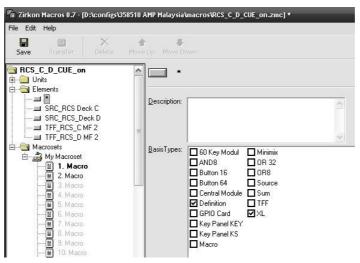
When using either of these operations, remember to change both the Rising Edge and Falling Edge if applicable.



## 6.4.7 Configuring Elements without a Name

The system configuration includes some elements which cannot be renamed. For example, the Central Module within the 'Surface' branch of the 'Tree Definition' window. These element functions must be added to the Macro Editor under the universal name of \*.

- 1. First, create a new element and rename it as \*.
- 2. Select the types of element you wish to add in our example, the XL Module and Definition types:



**3.** Now when you come to configure your macros, you will find a range of functions for these elements under the **XL** and **Definition** Function types:

Save Transfer Delete	🏠 Move Up	Move Down			
RCS_C_D_CUE_on 		1. Macro		☞ <u>R</u> isir	ng Edge 🦳 🤆 Falling Ed
	N	Function	Element	Parameter	Value
SRC_RCS Deck C	1	XL Definition	8	MF Key 2 VIS Page 2	ON ON
SRC_RCS_Deck D TFF_RCS_C MF 2 TFF_RCS_C MF 2 Macrosets My Macroset 2 Macro 2 Macro 4 Macro 4 Macro 5 Macro 5 Macro 9 Macro 10. Macro 10. Macro 10. Macro 11. Macro					
- 13. Macro					



### 6.4.8 Transferring a Macro set

You can transfer any of your macro sets to any system configured within the **Units** branch of the **Macro Editor**. Macro definitions are transferred via TCP/IP. They are then stored on the control system and are loaded whenever the system powers on.

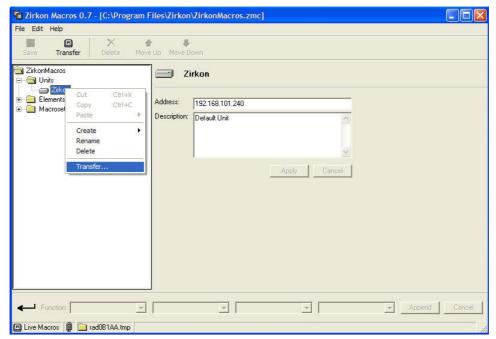
In systems with a redundant Master Board, then the macro definitions must be transferred to both Master Boards.

You can transfer a new macro set without restarting the system. This allows you to modify macros while the system is running online.

First make sure that your **Macro Editor** PC is connected and communicating with the system you wish to transfer to. Then make sure that you have transferred the system configuration that supports the Macro setup.

- 1. Select the macro set you wish to transfer, and click the **Set Default** button.
- 2. Select the unit you wish to transfer to, and check the IP Address.

**3.** To start the transfer, either click on the **Transfer** button from the Toolbar, or right-click and select **Transfer**:



A confirmation pop-up automatically appears showing the name of the macroset and unit you will transfer to:

Zirkon A	Aacros 🔀
(į)	Transfer default macroset 'Live Macros' to unit 'Zirkon' ?

#### 5. Click on **OK** to proceed.

Your PC will now connect to the system and transfer the macro data.

All 32 macros within the macro set are transferred; you cannot transfer a subset.



## 6.4.9 Saving the Macro Editor Configuration

The **Macro Editor** configuration, including all of the macro sets, elements and TCP/IP configuration, may be saved as a **.zmc** file on your PC. This allows you to open the file at a later date for editing or to perform a new transfer.

1. Either click on the Save button from the Macro Editor Toolbar or select File -> Save.

2. You will asked to enter a name and directory location for your configuration. Enter a name – e.g. **ZirkonMacros** - and then click **Save**.

The name and file path appears in the blue bar at the top of the **Macro Editor**, and the file name also appears in the top folder within the Selection Area:



From hereon, you can simply click on **Save** to save changes to this file. Or, use **Save As** to save changes to a different filename or path.



### 6.4.10 Trouble-shooting

To verify if all functions of all macro elements have been successfully assigned, the system offers a Telnet shell command. Once the session is open:

1. Type macro and press Enter for an overview of Macros 1 to 32 - for example:

A (u) behind a macro line signifies an element which could not be assigned. Elements that are not assigned are either not included in the console configuration or the element was spelt incorrectly.

2. To view other functions which can be executed from the Telnet session, type macro –h and press Enter:

-d <macro_number></macro_number>	- print the macro number only
-d <all></all>	- print all macros
-u	- print unresolved only
-е	- erase macro definitions



# 7. Appendices

This chapter includes further information which you may find useful.



## 7.1 Special Source Types

Tre	eedefiniti	ion: /Sou	rce / * Desk /	Source					×	
Parm	PFL	Conf	Down Src	Aux	Aux Switch	Keys			_	
Source							Туре	Mono	-	T
Display								Mono Stereo		Т
Alias								5.1	- 1	Т
Class			Default					5.1+2 VCA Group	- 1	Т
EmBER+	Local Pro	ovider No	none		•			Minimix R3LAY	- 1	Т
SrcRepl E	lement N	۱o.	none		•			Protools		)
List Enab	le									

When configuring a source, the following special source types are supported.

Source Type	Application	r	С	SC	S	N29
Source VCA Group	Create a VCA Group master.	✓	×	$\checkmark$	$\checkmark$	×
Source MiniMix	Control the level of another element such as a Minimixer.	✓	$\checkmark$	$\checkmark$	$\checkmark$	×
Source R3LAY (Jade)	Remotely control source parameters within Lawo's R3LAY (formerly known as Jade).	~	~	~	~	×
Source Protools	Remotely control channel functions within an external DAW.	✓	×	×	✓	×

### 7.1.1 Source Type = VCA Group

VCA grouping can be used to control several sources or summing buses from a single master fader.

Up to 8 VCA masters can be defined in the configuration, and you can assign any number of fader strips to each VCA master.

Please note:

- A fader strip can only ever be assigned to a single VCA.
- A VCA master cannot be slaved to another VCA.
- For your console to support VCA grouping, at least one VCA master must be defined in the configuration.

### **Creating a VCA Group**

VCA masters are a special type of source, and so they must be added to the "**Source**" branch of the 'Tree Definition'.

- 1. Insert a new **Source** in the usual manner, see <u>Creating Sources</u>.
- 2. Set the source **Type** to **VCA Group**:

Treedefinition: / Se	ource / * Desk / Source	
Parm PFL Conf	Down Src Aux Aux Switch Keys	
Source		Type Mono
Display		Mono Stereo
Alias		5.1
Class	Default	5.1+2 VCA Group
EmBER + Local Provider N	none	Minimix R3LAY
SrcRepl Element No.	none 🔻	Protools
List Enable		



### VCA Parameters

1. Select the VCA Group you wish to edit (from the "Source" branch of the 'Tree Definition') and open the **Parm** tab to adjust its main parameters.

AO		Treedet	finition: / So	urce / * Desk / S	Source = VCA1	×
Name	Value	Parm Down Src	Keys			
> Audio Input		Source	VCA 1		Type VCA Group 👻	
> Audio Out Only						
> Audio Output		Display	VCA1			
Conf Bus		VCA Group No.	1	-		
> Connect		EmBER+ Local Provider No	none	-		
> EmBER+		SrcBool Flomont No.	2020	-		
EmBER+ A_Line		SrcRepl Element No.	none	•		
> GP Sum		List Enable				
> GPI/O		Fader Up				
> GPI/O Network		Fader Down				
> Label						
> Level Control		Fader Toggle				
> Logic		Hold Mode			Default Pos (dB) 0	
> MF Key		Source Color Default	black	-		
> Minimix						
> N-1		Access Key User Off				
✓ Source						
✓ * Desk Source	NCA 1					
<i>y</i> 500100	VCA 1					
> Source	VCA 2					
> Source	VCA 3					

These are a subset of the <u>Source parameters</u> described earlier. Most important is the **Source name** which must be unique (e.g. VCA 1), and the VCA Group No (described below).

Use the **Display** name and **Source Color** options to define the label and color coding of the VCA master.

The VCA Group No can be used to define a fixed order for the VCA groups 1 to 8. It affects how the groups appear in the VCA menu; how they are stored in snapshots; and what happens if changes are made to the configuration.

To maintain compatibility with older ON-AIR Designer projects (< 6.6.0.24), the default setting is "Auto". However, it is recommended to use a specific number, so that if a VCA Group is later added or deleted, this will have no affect on the existing groups.

To define a fixed order, you must assign a unique number to *every* VCA Group source. Alternatively, the option can be left at "Auto" (to order the VCA Group sources automatically).

Please note:

- Each VCA Group No. must be used only once within the same configuration.
- You must not mix the "Auto" and fixed group numbers within the same configuration.

In snapshots, all settings are stored according to the VCA Group No. Thus, if you change from "Auto" to fixed numbering and wish to use existing snapshots, it is important that the fixed numbering matches that of the automatic sequence.



2. Open the "<u>System -> Definition -> Param = Fader</u>" branch of the 'Tree Definition'.

There are three relevant options: Show Group Fader Values, Group Fader Values Fallback and Group Fader Value Hold Time (in seconds).

OA					Treedef	inition: / s	System / I	Definition					×
Name	Value	Audio	Logic	Madi	OAC	Serial	TCP	Alarm	EmBER+	Ravenna	Project	AccessGrp 1	Matrix AccGrp 1
> Audio Input		Parameter	r		Setting	IS							
> Audio Out Only		Pan/Bal fir				-							
> Audio Output					~								
> Conf Bus		Sort by LC	D Text		<b>₩</b>								
> Connect		NTSC											
> EmBER+		DMS Integ	gration Mod	le	UltraFa	st	•						
EmBER+ ALine		Correction	Kev-LED		0								
> GP Sum		Correction			0								
> GPI/O													
> GPI/O Network		Gain Rese	t Off										
> Label		Conf'd Par	nels alway:	s green									
> Level Control		Can Bus S	peed		500K B	it	•						
> Logic		VCA enco	der max va	alue	0dB		<b>•</b>						
> MF Key		Vertenco		nac	oub								
> Minimix													
N-1		Parameter	r		Faders	;							
> Source		Use Scale	+9 dB										
> Sum Bus		Use Scale	0 dB										
> Surface		Ref Sourc	e Fader Of	fset			- 1						
✓ System			n Mode (Sa										
> Definition													
> Vis Chan			up Fader \		<b>~</b>								
		Group Fac	ler Values	Fallback	<b>Y</b>								
		Group Fac	ler Value H	lold Time	(: 3								

#### Working with VCAs

VCA groups use non-moving slave faders. This means that when you move the master fader, the slave faders remain stationary even though their level is changing. This allows you to see and update slave fader positions even if the VCA master is closed.

If the **Show Group Fader Values** option is enabled (in the "<u>System -> Definition -> Param = Fader</u>" branch of the 'Tree Definition'), then you will see the resulting fader values applied to VCA slaves in the fader strip displays. In our example, both slave faders are at 0dB, but the master VCA has been moved to +5 and therefore the combined level is +5dB:

	Cont +SdB 1B	A +548 V TAKE
ACCESS 2	ACCESS 2	ACCESS 2
1		

Combined level shown in slave fader displays

If the **Group Fader Values Fallback** option is also enabled, then the displays will revert to their default mode (e.g. source name) after a certain time period. The time period is set by the **Group Fader Value Hold Time** (in seconds).



### 7.1.2 Source Type = Minimix

The special source type (Source -> Minimix) creates a fader-controlled gain element which can be assigned to any level control. This allows you to control any level, such as the output of a <u>Minimixer</u>, from a fader. Using a VisTool Fader element, level can also be adjusted from an on-screen fader.

- 1. Insert a new **Source** in the usual manner, see <u>Creating Sources</u>.
- 2. Set the source **Type** to **Minimix**.
- 3. Name and edit the source parameters.

These are a subset of the <u>Source parameters</u> described earlier. Most important is the Reference name which must be unique - in our example, **HP Level**:

0	A			Treedefir	ition: /	/ Source / * Desk / Source	= HP Level	×
	Name	Value	Parm	Down Src	Keys			
>	Audio Input		Source		HP Le	evel	Type Minimix 🔻	
>	Audio Out Only		Disalau		HP 1			
>	Audio Output		Display					
	Balance Control		EmBER+ L	ocal Provider No	none	-		
>	Conf Bus		SrcRepl El	ement No.	none	-		
>	Connect		List Enable					
	Element State							
>	EmBER+		Fader Leve	el Sync				
>	EmBER+ A-stage		Fader Up					
	GP Sum		Fader Dov	vn.				
>	GPI/O							
	GPI/O Network		Fader Tog	igle				
	Hidden		Hold Mode	e			Default Pos (dB) 0	
	Label		Source Co	lor Default	<b>E</b> b	llack 👻		
>	Level Control		Source Co	nor Delault		IIdCK •		
>	Logic		Access Ke	y User Off				
>	MF Key							
>	Minimix							
	Panel							
	Ravenna Input							
$\sim$	Source							
	> * AutoMix							
	✓ * Desk							
		IP Level						
	> * Digital Sources							

The **Fader Level Sync** input can be used to set the gain from an external controller. Note that this is a oneway gain sync only, and so any changes made by the fader will not be sent back to the external controller.

4. Now locate the element you wish to control from the source - in our example, a Minimixer. And, assign the source's **Fader Level Out** control to the desired parameter field (**Level**):

OA	Treedefinition: / M	linimix / * Monitoring / Minimixer = MM_MON 2 DJ OUT	
Name	Value	Global Dim Mute Sys TB	
Name Audio Input Audio Input Audio Output Balance Control Conf Bus Connect Element State Element State EmBER+ A-stage GP Sum GP Sum GP GPUO GPUO GPUO GPUO GPUO Label Label Label Label Label Currol MIKIMEX GP MINIMIX GUEST 10UT MINIMIXEr MM_GUEST 10UT MINIMIXEr MM_GUEST 20UT MINIMIXEr MM_GUEST 20UT MINIMIXEr MM_GUEST 20UT MINIMIXEr MM_GUEST 20UT MINIMIXEr MM_GUEST 30UT MINIMIXEr MM_GUEST 30UT MINIMIXEr MM_GUEST 30UT MINIMIXEr MM_GUEST 30UT	Value	Global     Dim     Mute     Sys TB       Minimixer     MM_MON 2 DJ OUT       In L     In       In R     In       Mono     TFF_MON2 MON0.Out       Phase     TFF_MON2 PHASE.Out       Side     TFF_MON2 FLIP.Out       Level     HP 1.Fader Level Out       Default Level (init)     -128       Level Left     Intervention       Default Level Right     Intervention       Balance Inc     Intervention	Treeselection ? X  Level Control  A tavdMix  Desk Sources Sou
Minimixer MM_MON 1 LS PPM     Minimixer MM_MON 2 D3 OUT     Taikuack Panel Ravenna Input	)		OK Cancel
> Source > Sum Bus			

**5.** Once the configuration is saved and transferred, assign the source named **HP Level** to a fader strip. You can now remotely control the Minimixer level from its fader.





### 7.1.3 Source Type = R3LAY (Jade)

This special source can be used to remotely control a fader strip within Lawo's R3LAY (formerly known as Jade). The control data is exchanged via the Lawo control network using Ember+.

OA		Treedefinition: / Source / * Control / Source	×
Name	Value	Parm Aux Aux Switch Keys	
<ul> <li>&gt; Audio Input</li> <li>&gt; Audio Out Only</li> <li>&gt; Audio Output</li> <li>Connect</li> <li>&gt; EmBER+</li> <li>&gt; EmBER+ A-stage</li> <li>&gt; GP Sum</li> <li>&gt; GPI/O</li> <li>&gt; GPI/O Network</li> <li>&gt; Label</li> </ul>		Source R3LAY 01 Type R3LAY  Display Alias EmBER+ Local Provider No none R3LAY No. 1 Fader Up Fader Down	Mono 💌
Level Control     Logic     MF Key     Minimix		Fader Toggle       Hold Mode       Source Color Default       black       Mode   Source Color dis:	
N-1 Source * AutoMix * Control Source	R3LAY 01	Access Key User Off	
> * Digital Sources			

The parameters are a subset of the <u>Source parameters</u> described earlier. Most important are:

- the Reference name which must be unique (e.g. R3LAY 1).
- the Ember+ Local Provider No defined in the "System -> Definition".
- the R3LAY No. and Ember+ Name fields which select the R3LAY application and its source fader. The R3LAY No must be unique (within the configuration of this device).

Once the configuration has been transferred to the system, you can assign the R3LAY source to a fader strip in the usual manner. The console fader will remotely control the designated R3LAY fader.



### 7.1.4 Source Type = Protools

Using a serial to MIDI interface, you can connect **Power Core** or **sapphire MK2** systems to any DAW supporting the Mackie-HUI<sup>™</sup> protocol. For details on the connections, please see the RS-422 wiring for your product. Here we will deal with the configuration.

Although the 'Tree Definition' paths are named Protools, these elements can be used for any DAW supporting the Mackie-HUI<sup>™</sup> protocol.

#### **Using Protools Sources**

Up to eight special ProTools<sup>™</sup> Sources can be created in order to control channel functions within the DAW from a fader strip.

- 1. Insert a new **Source** in the usual manner, see <u>Creating Sources</u>.
- 2. Set the source **Type** to **Protools**:

Treedefinition: / Sou	rrce / * Desk / Source	×
Parm PFL Conf	Down Src Aux Aux Switch Keys	$\frown$
Source		Type Mono 🔻
Display		Mono Stereo
Alias		5.1
Class	Default	5.1+2 VCA Group
EmBER + Local Provider No	none 🔻	Minimix R3LAY
SrcRepl Element No.	none 🔻	Protools
List Enable		

#### **3.** Select the ProTools source to define its parameters:

OA		Treedefinition	1: / Source / * Remote / Sou	rce = DAW 1	×
	Name	Value	Parm		
> 4	Audio Input		Source	DAW 1	Type Pro Tools 🔻
	Audio Out Only				
	Audio Output		Display	DAW 1	
	Balance Control		EmBER+ Local Provider No	none 🔻	
	Conf Bus		Pro Tools Fader	ch. 1 👻	
	Connect		List Enable	<b>v</b>	
	Element State				
	EmBER+		Source Color Default	black 👻	
	EmBER+ A-stage		Access Key User Off		
	GP Sum				
	GPI/O				
	SPI/O Network				
	Hidden				
	.abel .evel Control				
	.ogic MF Key				
	Minimix				
	Panel				
	Ravenna Input				
	Source				
	> * AutoMix				
	> * Desk				
	> * Digital Sources				
	> * External Sources				
	> * Hybrid Sources				
	> * Microphone Source	s			
	> * Player Sources				
	> * Ravenna Sources				
	✓ * Remote				
	> Source	DAW 1			
	> Source	DAW 2			
	> Source	DAW 3			
	> Source	DAW 4			
	> Source	DAW 5			
	> Source	DAW 6			
	> Source	DAW 7			
	> Source	DAW 8			

These are a subset of the <u>Source parameters</u> described earlier. Most important are the Reference name which must be unique (e.g. **DAW 1**), and the **Pro Tools Fader** field which defines the ProTools channel number.

Once the configuration has been transferred to the system, you can assign the Protools source to a fader strip in the usual manner. The console fader will remotely control the designated ProTools fader.

The fader strip MF Keys will then provide the following remote controls:





- MF 1a = RECORD Enable
- MF 1b = Insert
- MF 2a = AUTOMATION Status
- MF 2b = SELECT
- **MF 3** = channel MUTE
- MF 4 = channel SOLO (PFL)

The fader strip's rotary control has the same function as on the Mackie-HUI control panel. For a detailed description of these functions, please consult your DAW manual.



## 7.2 CAN Bus Addressing

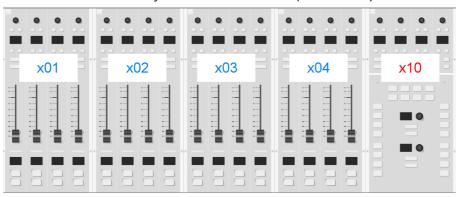
The CAN bus address, also known as the Frame ID, is a unique address which defines the role of each control surface module within the system.



### 7.2.1 ruby CAN Bus Addressing

For ruby, the following options are supported:

- Address 01 to 0F (hexadecimal) can be assigned to Fader Modules.
- Address 10 (hexadecimal) is *always* assigned to the first full mode Central Module. Every layout includes this assignment.
- Address 11 (hexadecimal) is not available for assignment.
- Address 12 to 17 (hexadecimal) can be assigned to additional Central Modules:
  - For a standard DSP Core, these must run in monitor mode.
  - For Power Core Max, hex address 12 to 14 can run in either full or monitor mode; hex address 15 to 17 must run in monitor mode.



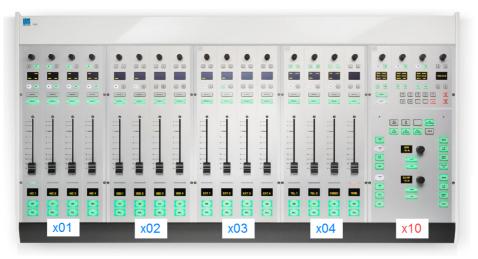
Frame -> Surface: CAN Bus Addresses (hexadecimal)

Each address must be unique, so do not assign the same address to more than one module. If you do so, this can lead to control conflicts and odd behaviour of the surface.

To mirror faders or other controls, use the programmable logic features of the DSP Core, such as "fader mapping" or "source replication".

#### Single-frame Consoles

By default, each control surface frame ships with the following CAN bus addresses: the first Fader Module on the left = hex address 01; the next Fader Module = hex address 02; and so on; the Central Module = hex address 10. Thus, for a single-frame console there is usually no further action required, as the modules will map correctly to the configuration.



Console: CAN Bus Addresses (hexadecimal)



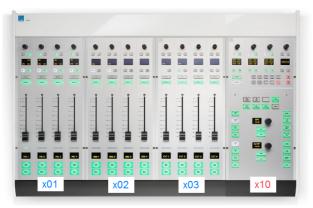
#### Split-frame Consoles

For a split-frame surface, you will need to adjust the CAN bus addresses on the additional frames so that they match the configuration supplied with the system. An example is shown below.

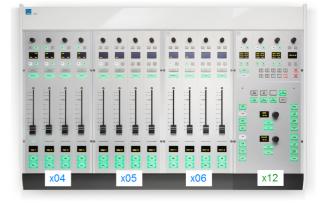
In this instance, the Frame -> Surface configuration does not look anything like the physical console, as it is the CAN bus addresses which define the functionality. In our example, the surface on the left controls faders 1 to 24 (in two layers); while the surface on the right controls faders 25 to 48.

Frame -> Surface: CAN Bus Addresses (hexadecimal)

		• • • •																	ľ	ľ	
																••					
		8888													8 8 8	8 8 8					
x01	x02	x03	x04	x05	x06	x07	x08	x09	XOA	x0B	x0C	VOD	x0E	x0F	x10	x12	v13	x14	x15	x16	x



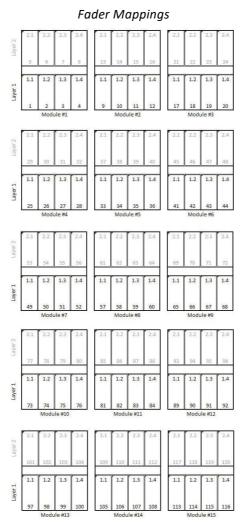
Console: CAN Bus Addresses (hexadecimal)





### **Control Surface Layers (Fader Mappings)**

Each Fader Module supports two layers. This means that the module set to hex address 01 controls fader strips 1 to 4 (Layer 1) and 5 to 8 (Layer 2); the module set to hex address 02 controls fader strips 9-12 and 13-16; and so on.





## 7.2.2 crystal CAN Bus Addressing

For crystal, the following options are supported:

- Address 01 to 06 (hexadecimal) are assigned to Fader Modules.
- Address 0F & 0E (hexadecimal) are assigned to the two Central Modules.

Frame -> Surface: CAN Bus Addresses (hexadecimal)

											٠		
:	:		02		:= :- 0x	: : : : : : : : : : : : : : : : : : :		0x	04			0x0F	0x0E
0				0	0			- 0	0	0		****	

Each address must be unique, so do not assign the same address to more than one module. If you do so, this can lead to control conflicts and odd behaviour of the surface.

#### Single-frame Consoles

By default, each control surface frame ships with the following CAN bus addresses: the first Fader Module on the left = hex address 01; the next Fader Module = hex address 02; and so on; the Central Module = hex address 10. Thus, for a single-frame console there is usually no further action required, as the modules will map correctly to the configuration.

#### Split-frame Consoles

For a split-frame surface, you will need to adjust the CAN bus addresses on the extender module(s) so that they match the configuration supplied with the system.

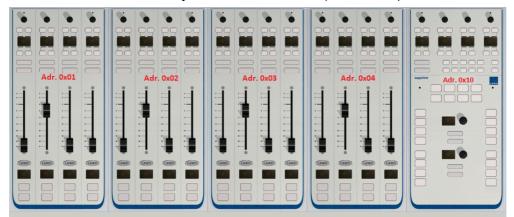


### 7.2.3 sapphire compact CAN Bus Addressing

For sapphire compact, the following options are supported:

- Address 01 to 04 (hexadecimal) are assigned to Fader Modules. Each one can be a standard, self-operated or virtual module.
- Address 10 (hexadecimal) is always assigned to the Central Module.

Frame -> Surface: CAN Bus Addresses (hexadecimal)



Each address must be unique, so do not assign the same address to more than one module. If you do so, this can lead to control conflicts and odd behaviour of the surface.

#### Single-frame Consoles

By default, each control surface frame ships with the following CAN bus addresses: the first Fader Module on the left = hex address 01; the next Fader Module = hex address 02; and so on; the Central Module = hex address 10. Thus, for a single-frame console there is usually no further action required, as the modules will map correctly to the configuration.

#### Split-frame Consoles

For a split-frame surface, you will need to adjust the CAN bus addresses on the extender module(s) so that they match the configuration supplied with the system.



## 7.3 Matrix Numbers

When using matrix functions, the inputs and outputs within the Lawo system are addressed as shown below. Note that the matrix address is the same as the **ID** number shown in the Command -> Inputs/Outputs lists, and so this can be a useful way to determine the address for an individual signal. To control crosspoints within an external matrix, please contact the manufacturer for details on their matrix addressing system.

Matrix Address		DSI	P Core	
Main Audress	Power Core	NOVA17	NOVA29	COMPACT ENGINE
1	IO CARDS		MADI 1	LOCAL IO
65		IO CARDS	MADI 2	
129	MADI 1	MADI 1	MADI 3	MADI 1
193	MADI 2	MADI 2	MADI 4	MADI 2
257	MADI 3	MADI 3	MADI 5	MADI 3
321	MADI 4	MADI 4	MADI 6	MADI 4
385		MADI 5	MADI 7	LOOPBACKS
449	MADI SLOT 1	MADI 6	MADI 8	
513			MADI 9	
577	MADI SLOT 2		MADI 10	
641		LOOPBACKS	MADI 11	
705	MADI SLOT 3		MADI 12	
769		UDP	MADI 13	
833	MADI SLOT 4		MADI 14	
897			MADI 15	
961	MADI SLOT 5	GT	MADI 16	
1025				
1089	MADI SLOT 6			
1153			LOOPBACK PORTS	
1217	MADI SLOT 7			
1281			5140	
1345	MADI SLOT 8		DMS	
1409			GT 1	
1473			GT 2	
1537	RAVENNA			
1601				
1665				
1729				
1793	LOOPBACKS			
1857				
1921				
1985	GT			
2049	UDP			





## 7.4 Mackie HUI Parameters

The following table lists the Mackie-HUI™ protocol Central Control functions which can be remotely controlled from Power Core or sapphire MK2/Nova17 systems. For a detailed description of each function, please consult your DAW manual.

Group	Name	Lawo System -> DAW	DAW -> Lawo System
V-Pot Assign	Input	Yes	Yes
V-Pot Assign	Output	Yes	Yes
V-Pot Assign	Pan	Yes	Yes
V-Pot Assign	Send A	Yes	Yes
V-Pot Assign	Send B	Yes	Yes
V-Pot Assign	Send C	Yes	Yes
V-Pot Assign	Send D	Yes	Yes
V-Pot Assign	Send E	Yes	Yes
Global	Channel <	Yes	Yes
Global	Channel >	Yes	Yes
Global	Bank <	Yes	Yes
Global	Bank >	Yes	Yes
Global	Assign	Yes	Yes
Global	Default	Yes	Yes
Global	Suspend	Yes	Yes
Global	Flip	Yes	Yes
Global	Mute	Yes	Yes
Global	Bypass	Yes	Yes
Global	Rec/Rdy	Yes	Yes
Auto Enable	Plug-In	Yes	Yes
Auto Enable	Pan	Yes	Yes
Auto Enable	Fader	Yes	Yes
Auto Enable	Send Mute	Yes	Yes
Auto Enable	Send	Yes	Yes
Auto Enable	Mute	Yes	Yes
Auto Mode	Trim	Yes	Yes
Auto Mode	Latch	Yes	Yes
Auto Mode	Read	Yes	Yes
Auto Mode	Off	Yes	Yes
Auto Mode	Write	Yes	Yes
Auto Mode	Touch	Yes	Yes
Window	Mix	Yes	Yes
Window	Edit	Yes	Yes
Window	Transport	Yes	Yes
Window	Mem-Loc	Yes	Yes
Window	Status	Yes	Yes
Window	Alt	Yes	Yes
Keyb. Shortcuts	Ctrl/Clutch	Yes	Yes
Keyb. Shortcuts	Shift/Add	Yes	Yes



Group	Name	Lawo System -> DAW	DAW -> Lawo System
Keyb. Shortcuts	Edit	Yes	Yes
Keyb. Shortcuts	Undo	Yes	Yes
Keyb. Shortcuts	Alt/Fine	Yes	Yes
Keyb. Shortcuts	Option/All	Yes	Yes
Keyb. Shortcuts	Edit-Tool	Yes	Yes
Keyb. Shortcuts	Save	Yes	Yes
Functionkeys	F1	Yes	Yes
Functionkeys	F2	Yes	Yes
Functionkeys	F3	Yes	Yes
Functionkeys	F4	Yes	Yes
Functionkeys	F5	Yes	Yes
Functionkeys	F6	Yes	Yes
Functionkeys	F7	Yes	Yes
Functionkeys	F8/ESC	Yes	Yes
Status/Group	Phase	Yes	Yes
Status/Group	Monitor	Yes	Yes
Status/Group	Auto	Yes	Yes
Status/Group	Suspend	Yes	Yes
Status/Group	Create	Yes	Yes
Status/Group	Group	Yes	Yes
Edit	Paste	Yes	Yes
Edit	Cut	Yes	Yes
Edit	Capture	Yes	Yes
Edit	Delete	Yes	Yes
Edit	Сору	Yes	Yes
Edit	Separate	Yes	Yes
Transport	Talkback	Yes	Yes
Transport	Rewind	Yes	Yes
Transport	FastFwd	Yes	Yes
Transport	Stop	Yes	Yes
Transport	Play	Yes	Yes
Transport	Record	Yes	Yes
Transport	Down	Yes	Yes
Transport	Left	Yes	Yes
Transport	Mode	Yes	Yes
Transport	Right	Yes	Yes
Transport	Up	Yes	Yes
Transport	Scrub	Yes	Yes
Transport	Shuttle	Yes	Yes
Transport	RTZ	Yes	Yes
Transport	End	Yes	Yes
Transport	Online	Yes	Yes
Transport	Loop	Yes	Yes



Group	Name	Lawo System -> DAW	DAW -> Lawo System
Transport	Quickpunch	Yes	Yes
Transport	Audition	Yes	Yes
Transport	Pre	Yes	Yes
Transport	In	Yes	Yes
Transport	Out	Yes	Yes
Transport	Post	Yes	Yes



## 7.5 Ember+ Tree

Ember+ parameters are addressed as follows.

Key

М	Mono	r	read only	I	Integer
S	Stereo	rw	read and write	R	Real
5.1	5.1 & 5.1+2			E	Enumeration
V	VCA			В	Boolean
J	R3LAY			U	UTF8
Mx	MiniMix				
Р	Pro Tools				

1				Product		_								
1. 12				Sources / Sums										
1.12.	1n			Name	Min	Мах	Туре	Protect	Source	is I		Ś	Sums	5
1.12.	1n . 1 .			Audio Type	0	4	E14	r	M S 5.1	VJ	Мx	ΡM	S 5.	.1 J
1.12.	1n . 2 .			Source Class	0	4	E15	r	M S 5.1	νJ	_			_
1.12.	1n . 3 .			Fader					M S 5.1	νJ	Mx	ΡM	S 5.	.1 J
1.12.	1n . 3 .	1		Number	0	120	I	r	M S 5.1	νJ	Mx	ΡM	S 5.	.1 J
1.12.	1n . 3 .	2		Motor db Value	-191	9	R	rw	M S 5.1	νJ	Mx	ΡM	S 5.	.1 J
1.12.	1n. 3.	3		Motor Position	0	255	I	rw	M S 5.1	νJ	Mx	ΡM	S 5.	.1 J
1.12.	1n . 3 .	4		Manual dB Value	-191	9	R	rw	M S 5.1	νJ	Mx	ΡM	S 5.	.1 J
1. 12.	1n . 3 .	5		Manual Position	0	255	Ι	rw	M S 5.1	VJ	Mx	ΡM	S 5.	.1 J
1. 12.	1n . 4			DSP					M S 5.1	П		М	S 5.	.1 J
1. 12.	1n . 4 .	1		Input					M S 5.1	П		П	П	Π
1. 12.	1n . 4 .	1.	1	Gain[dB]	-30	18	Ι	rw	M S 5.1			Т		П
1.12.	1n . 4 .	1.	2	Mic Gain [dB]	0	70	Ι	rw	Mic In	out		Т		$\square$
1. 12.	1n . 4 .	1.	3	Back Gain [dB]	-120	9	Ι	rw	ΜS	П		П	П	Π
1. 12.	1n . 4 .	1.	4	Rumble (powercore / sapphire)	0	3	E1S	rw	Mic In	out		П	П	Π
1. 12.	1n . 4 .	1.	4	Rumble (crystal)	0	1	E1C	rw	Mic In	out		П	П	Π
1.12.	1n . 4 .	1.	5	Pad	0	1	В	rw	Mic In	out		Т		П
1. 12.	1n . 4 .	1.	6	Phantom	0	1	В	rw	Mic In	out		П	П	Π
1.12.	1n . 4 .	1.	7	Phase	0	1	В	rw	MS	$\square$		Т		$\Box$
1. 12.	1n . 4 .	1.	8	LR Mode	0	6	E2	rw	S	$\square$		$\mathbf{T}$		$\Box$
1. 12.	1n . 4 .	1.	9	Pan	-12	12	Ι	rw	М		•	5.1 Sı		
					_							figur	· · ·	
1. 12.	1n . 4 .	1.	10	Balance	-12	12	1	rw	S		`	5.1 Sı		
1. 12.	1n . 4 .	1.	11	Basis	0	10		rw	S		con	figur	ea)	┯┥
$1 \cdot 12 \cdot 12 \cdot 1 \cdot 12 \cdot$	1 4 . 1n . 4 .	1.	11	Center Slope	0	10	R	rw	M	(5.1 S			figu	rod
$1 \cdot 12 \cdot 12 \cdot 1 \cdot 12 \cdot$	1 4 . 1n . 4 .	1.		LFE [dB]	-120	0	R I	rw	M S 5.1	(5.1 S			-	
1 . 12 . 1 . 12 .	1n . 4 .	1.	13	Surr. Pan LR	-120	12		rw	M S	(5.1 S			-	
1 . 12 . 1 . 12 .	1n . 4 .	1.		Surr. Pan FB	-12	12		rw	M S	(5.1 S			_	
$1 \cdot 12 \cdot 12 \cdot 1 \cdot 12 \cdot$	1 4 . 1n . 4 .	1.	15	Channel On	-12	12	B	rw	M S 5.1	,3.1 3	Jann		ingu	i eu)
1 . 12 . 1 . 12 .	1n . 4 .	1.	16	N-1 Gain [dB]	-30	18		rw	M S 5.1	┝╼╋┩		╉┦	┝╋╾	╉┩
1 . 12 . 1 . 12 .	1n . 4 .	2	10	Equalizer	-30	10		1 VV	M S 5.1	┝╋┩		М	S 5.	╉┥
1. 12. 1. 12.	1n . 4 .	2.	1	On	0	1	В	rw	M S 5.1	┍╼╂┩		м	S 5.	
1 . 12 . 1 . 12 .	1n . 4 .	2.	2	Band 1 (filter low)	v	<u> </u>		1 VV	M S 5.1	┝╋╋		М	S 5.	_
1 . 12 . 1 . 12 .	1n . 4 .	2.	2.	1 Frequency	0	59	E3	rw	M S 5.1	┝╋╋		М	S 5.	
1. 12.	1n . 4 .	2.		2 Gain [dB]	-15	15		rw	M S 5.1	┍╼╋┩		м	S 5.	_
1. 12.	1n . 4 .	2.	2.	4 Mode	0	15	E4	rw	M S 5.1	┍╼╋┩		M	S 5.	
1 . 12 . 1 . 12 .	1n . 4 .	2.	3-5	Band 2-4 (EQ)				1 VV	M S 5.1	┝╋╋		M		
1. 12. 1. 12.	1n . 4 .	2.		1 Frequency	0	59	E3	rw	M S 5.1	┍╼╂┩		м	5 J.	╣
т. тс.	1 4.	۷.	J <sup>.</sup> J .		0	55		1 VV	<sup>171</sup> J J.1			IVI	55	·



1				Product												
1.12				Sources / Sums												
1.12.	1n			Name	Min	Мах	Туре	Protect	S	Sour	ces	Τ		Sı	ums	
1.12.	1n. 4	. 2	. 3-5.	2 Gain [dB]	-15	15	Ι	rw	М	S 5	1	Τ		MS	S 5.	1
1.12.	1n. 4	. 2	. 3-5.	3 Q	0	5	E5	rw	М	S 5	1			MS	S 5.	1
1.12.	1n. 4	. 2	. 6	Band 5 (filter high)					М	S 5	1	L		MS	S 5.	1
1.12.	1n. 4	. 2	. 6.	1 Frequency	0	59	E3	rw	М	S 5	1	L		MS	S 5.	1
1.12.	1n. 4	. 2	. 6.	2 Gain [dB]	-15	15	Ι	rw	М	S 5	1	L		MS	S 5.	1
1.12.	1n. 4	. 2	. 6.	4 Mode	0	1	E6	rw	М	S 5	1			MS	S 5.	1
1. 12.	1n . 4	. 3		Dynamics						S 5	_			MS	S 5.	1
1.12.	1n . 4	. 3	. 1	On	0	1	В	rw	-	S 5	_			MS	S 5.	1
1.12.	1n . 4	_	. 2	Corr Gain [dB]	-12	0	1	rw	-	S 5	_	╇		Щ	╄	┶
1. 12.	1n. 4		. 3	Compressor					_	S 5	_	╇			S 5.	
1. 12.	1n. 4			1 On	0	1	В	rw	-	S 5	_	╇		MS	-	
1. 12.	1n . 4		. 3.	2 Threshold [dB]	-93	27		rw	-	S 5	_	╇	_	MS	-	
1.12.	1n . 4		. 3.	3 Ratio	0	9	E7	rw	-	S 5	_	╇	_	MS	-	
1.12.	1n . 4	_	. 3.	4 Attack Time	0	9	E8	rw	-	S 5	_	+	+	MS	-	
1. 12.	1n . 4			5 Release Time	0	14	E9	rw	-	S 5	_	╋	╋	MS	-	
1. 12.	1n . 4		. 4	Expander		-			-	S 5	_	╋	╋	MS	-	
1. 12.	1n. 4	_		1 On 2 Threshold [dP]	0	1	В	rw	-	S 5	_	╋	╋	MS	-	
1. 12. 1. 12.	1n. 4	_		2 Threshold [dB] 3 Ratio	-93 0	27 9	I E10	rw	-	S 5	_	╋	╋	MS	-	
1. 12. 1. 12.	1n. 4		. <u>4</u> . . 5	Gate	0	9	E10	rw	-	S 5	_	╉─	+	MS	-	
1. 12.	1n . 4 1n . 4	_		1 On	0	1	В	rw	-	S 5	_	╋	+	M S M S	_	
1. 12.	1n . 4		. <u>5</u> . . <u>5</u> .	2 Threshold [dB]	-93	27		rw	-	S 5	_	+-	+	M S	_	
1. 12.	1n . 4	_	. <u>5</u> .	3 Attack Time	-93	9	E8	rw	_	S 5	_	╋	╈	M S	_	
1. 12.	1n . 4	_		4 Release Time	0	14	E9	rw	_	S 5	_	╋	+	MS	_	
1. 12.	1n . 4			DeEsser	0	14	25	1 00	М	_	╉╉	╋	╈	H	<u> </u>	
1. 12.	1n . 4	_		1 On	0	1	В	rw	М	_	╋╋	╋		H	╋	╉┩
1. 12.	1n . 4	_	. 6.	2 Mode	0	1	E11	rw	М	_	++			Ħ	╈	╈
1. 12.	1n . 4	_		3 Reduction	0	10	1	rw	М	_	++	╋		Ħ	╈	+
1.12.	1n. 4			AutoMix					М	_	+		t	ht	t	$\square$
1.12.	1n. 4	. 4	. 1	On	0	1	В	rw	М	S	++	╈	T	Ħ	┮	$\mathbf{H}$
1. 12.	1n. 4	. 4	. 2	Weight [dB]	-9	9	I	rw	М	S	Π	T		П	T	П
1. 12.	1n. 4	. 4	. 3	Speed	0	14	E9	rw	М	S	Π	T		П	T	П
1.12.	1n. 4	. 4	. 4	Group (Crystal max 2)	1	4	Ι	rw	М	S	Π	Т			Т	П
1.12.	1n. 4	. 5		Limiter					М	S 5	1			MS	S 5.	1
1.12.	1n. 4	. 5	. 1	On	0	1	В	rw	М	S 5	1	Τ		MS	S 5.	1
1.12.	1n. 4	. 5	. 2	Threshold [dB]	-93	27	Ι	rw	М	S 5	1			MS	S 5.	1
1.12.	1n. 4	. 5	. 3	Release Time	0	14	E9	rw	М	S 5	1			MS	S 5.	1
1.12.	1n. 4	. 6		Delay					М	S 5	1			MS	S 5.	1
1. 12.	1n. 4			On	0	1	В	rw		S 5	_			MS	S 5.	1
1. 12.	1n. 4			Time (ms) (sapphire, crystal)	0	340	R	rw		S 5	_				S 5.	
1. 12.	1n . 4	. 6	. 2	Time (ms) (powercore)	0	5300	R	rw		S 5	_			MS	S 5.	1
1. 12.	1n . 5			Aux buses		L				S 5	_	╇		μ	╇	$\downarrow \downarrow$
1.12.		. 120		Aux Name		<u> </u>				S 5.	_	╇		Щ	╄	$\downarrow \downarrow$
1.12.		. 120		Gain [dB]	-120	_	Т	rw		S 5	_	╇		Щ	╄	╄
1. 12.		. 120	. 2	State	0	2	E12	rw		S 5	_	╇	╇	μ	╇	╇
1.12.	1n . 6			MF Keys		<u> </u>			-	_	_	JM	_			
1.12.		. 1-4		MF1a- MF2b					-	_		JM	_	_	_	
1.1.2.		. 1-4		Label		<u> </u>	U	r	-	S 5	-	_	хP	_	S 5.	
1. 12.		. 1-4		Key	0	1	В	rw	-	S 5		_	x P	_	S 5.	
1. 12.		. 1-4		LED State		-	F 1 2		-	S 5	-	JM	-	_	S 5.	
1. 12.		. 1-4			0	7	E13	r		S 5	-	_	x P		S 5.	-
1. 12.		. 1-4		2 Low	0	1	В	r			-	JM	-	_	_	1 J
1. 12.		. 1-4	. 3.	3 Blink	0	1	В	r			_	JM	_			
1. 12.	1n. 6	. 5-7		MF3-5 (5 powercore / sapphire only	()				IVI	3 5	1 V	JM	хP	NI S	S 5.	1 J



1			Product												
1. 12			Sources / Sums												
1. 12.	1n		Name	Min	Мах	Туре	Protect	۰,	ourc	es			Sι	ums	
1. 12.	1n. 6. 5-7.	2	Кеу	0	1	В	rw	М	S 5.1	V	J№	x P	MS	S 5.1	J
1. 12.	1n. 6. 5-7.	3	LED State					М	S 5.1	V	J№	x P	MS	S 5.1	J
1. 12.	1n. 6. 5-7.	3.	1 Color	0	7	E13	r	М	S 5.1	V	J№	x P	MS	S 5.1	J
1. 12.	1n. 6. 5-7.	3.	2 Low	0	1	В	r	М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n. 6. 5-7.	3.	3 Blink	0	1	В	r	М	S 5.1	V	J№	x P	MS	S 5.1	J
1. 12.	1n . 6 . 8-11		MF6-9 (powercore / sapphire only)					М	S 5.1	V	JM	ĸР	МS	5.1	J
1. 12.	1n . 6 . 8-11 .	1	Label			U	r	М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n . 6 . 8-11 .	2	Key	0	1	В	rw	М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n . 6 . 8-11 .	3	LED State					М	S 5.1	V	J№	x P	MS	S 5.1	J
1. 12.	1n . 6 . 8-11 .	3.	1 Color	0	7	E13	r	М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n . 6 . 8-11 .	3.	2 Low	0	1	В	r	М	S 5.1	V	J№	x P	MS	S 5.1	IJ
1. 12.	1n . 6 . 8-11 .	3.	3 Blink	0	1	В	r	М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n. 7		States					М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n.7.1		Fader Motor Start	0	1	В	r	М	S 5.1	۷	J№	x P	MS	S 5.1	J
1. 12.	1n.7.2		Fader Manual Start	0	1	В	r		S 5.1			x P			
1. 12.	1n.7.3		Fader Result Start	0	1	В	r	М	S 5.1	V	J№	x P	MS	5 5.1	IJ
1. 12.	1n.7.4		PFL1 active	0	1	В	r	М	S 5.1						
1. 12.	1n. 8		VCA Groups					М	S 5.1	V					
1. 12.	1n. 8 <u>1</u>		Assigned Group Number	0	8	Ι	rw	М	S 5.1	V					
1. 12.	1n. 9		Labels					М	S 5.1	V	J№	x P			
1. 12.	1n. 9. 1		User Label					М	S 5.1	V	J№	x P			
1. 12.	1n. 9. 1.	1	Line 1			U	rw	М	S 5.1	V	J№	x P			
1. 12.	1n. 9. 1.	2	Line 2			U	rw	М	S 5.1	۷	JM	x P	Π		$\Box$
1. 12.	1n . 10		Insert (powercore only)						Γ		Ι	Ι	Π		$\Box$
1. 12.	1n. 10. 1		Name (powercore only)			E	rw	М	S		Ι	Ι	Π		$\Box$
1. 12.	1n. 10. 2		Position (powercore only)			E	rw	М	S		Ι	Ι	Π		$\Box$

## 7.5.1 Misc

1			Product	Min	Max	Туре	Protect
1.1			Sources	So	urces	and	
1.2			Sums	S	um ta	ble	
1.3			Matrices				
1.3	. 1		System Matrix				
1.3	. 2	•	Matrix Params				
1.3	. 2	. 1	targets				
1.3	. 2	. 1 . 1-n	Name				
1.3	. 2	.1.1-n.1	Group			U	r
1.3	. 2	.1.1-n.2	Name			U	r
1.3	. 2	.1.1-n.3	Туре	0	6	EM1	r
1.3	. 2	.1.1-n.4	Gain[dB]	-30	9	I	r
1.3	. 2	.1.1-n.5	Protected	0	1	В	rw
1.3	. 2	. 2	sources				
1.3	. 2	. 2 . 1-n	Name				
1.3	. 2	<u>.2.1-n.1</u>	Group			U	r
1.3	. 2	<u>.2.1-n.2</u>	Name			U	r
1.3	. 2	<u>.2.1-n.3</u>	Туре	0	6	EM1	r
1.3	. 2	<u>.2.1-n.4</u>	Gain[dB]	-30	9	I	rw
1.3	. 3		Matrix Labels				
1.3	. 3	. 1	targets				
1.3	. 3	. 1 . 1-n	L1 to Ln			U	r
1.3	. 3	. 2	sources				
1.3	. 3	. 2 . 1-n	L1 to Ln			U	r
1.4			GPIOs				



4 4 4			-			
<u>1.4.1-n</u>		Name				
<u>1.4.1-n</u>		Output Register				r
<u>1.4.1-n</u>		Output Signals				
	. 2 . 1-32	Name				
	. 2 . 1-32. 1	State	0	1	В	r
1.4.1-n	. 3	Input Register			I	r/rw
1.4.1-n	. 4	Input signals				
1.4.1-n	. 4 . 1-32	Name				
1.4.1-n	. 4 . 1-32. 1	State	0	1	В	r/rw
1.5		Functions				
1.5.1		ParamLoopBack				
1.5.2		RampMotorFader	Fun	ction	table	
1.5.3		SetPFLState				
1.6	(powercore only)	RAVENNA	RAV	ENNA	table	
1.7	(powercore only)	IO Cards	100	Card t	table	
1.7	(powercore only)	GPIO Card	10 0	Card t	table	
1.29	(powercore only)	System	Sys	stem t	able	
1.29	(legacy only)	System				
1.29.1	(legacy only)	System Type	0	3	EM2	r
1.29.2	(legacy only)	M2 Mode	0	3	EM3	r
1.29.3	(legacy only)	Card Position	0	1	EM4	r
1.29.4	(legacy only)	Card State	0	5	EM5	r
1.30		identity				
1.30.1		product			U	r
1.30.2		company			U	r
1.30.3		serial			U	r
1.30.4		version			U	r
1.30.5		role			U	r
1.31		Configuration				
1.31.1		Timestamp			U	r

## 7.5.2 Enumerations (Misc)

EM1	Source	Туре	EM4	System	Card Positio
		Onone			0M1
		1mono			1M2
		2left	EM5	System	Card State
		3right		System	
		4stereo			0 Active
		55.1	ור		1Inactive
		65.1+2	71		2Standalone
			51	L	3 Isolate Activ
EM2S	System	Туре	41		4 Isolate Inact
		0 Default			5Undefined
		1Sapphire	EM6	System	Sampling Ra
		2Nova17MK2	(powercore)	System	
		3Audio1F			044.1 kHz
EM2C	System	Туре	<b>-</b>		148 kHz
	System	0 Default	┥╞━━━━━		
		qDerault		System	Prio Sequen
EM3	System	M2 Mode	(powercore)		
		ONormal			OPTP - MADI ·
		1Standalone			WordClock
	•	-	-		1PTP - WordC



EM3	System	M2 Mode 2 Isolate	EM7 (powercore)	System	Prio Sequence
		3Unknown			- MADI
		•	_		2MADI - PTP -
					WordClock
					3MADI -
					WordClock - PTP
					4WordClock - PTP
					- MADI
					5WordClock -
					MADI - PTP

## 7.5.3 Function Calls

ParamLoop	Back				
		unction. Entered v	alues	are Loo	ped Back.
	Arguments		Ту		allowed
	Boolean Par.		В		0/1
		Integer Par.	I		Int
		Real Par.	R		Real
	String Par.		U		String
	Result	s			
		Boolean Res.	В		
		Integer Res.	I		
		Real Res.	R		
		String Res.	U		
RampMoto	orFade	•			
		a Motor Fader wit	thin a	n entere	d time
		efined gain.	ci ili a		
	Argun			Туре	allowed
	S	ource Name		U	existing Sources / Sums
	G	iain[dB]		R	-999 to +9
	ΙL				bounded to -191 to +9
	Т	ime[s]		R	0 to 10 ( <0.5 = at once)
	Result	S			
	R	esult		I	
		0 Success			
		1 Incorrect num	nber c	of param	eters
		2 Incorrect data	atype		
		3 Input value ou	ut of I	range	
		4 Source / Sum			
		5 Source / Sum	not a	ssigned	
		6 Combination	of va	ues not	allowed
		(level differen	nce to	small / t	time to large)



SetPFLState								
Set a	Set a Sources PFL State.							
Argu	imen	its	Туре	allowed				
	Sour	ce Name	U	existing Sources / Sums				
	Statu	JS	В	0/1				
Resu	ults							
	Resu	ılt	1					
	0	Success						
	1	Incorrect number	of param	neters				
	2	Incorrect datatype	e					
	4	Source / Sum not	found					
	5	Source / Sum not	assigned					

## 7.5.4 RAVENNA

ER1	Input	Туре	ER2
		Onone	
		1mono	
		2stereo	
		3surround	
		416-channel	
		532-channel	
		664-channel	

Input		Codec
	0	none
	1	L16
	2	L24
	3	L32
	4	AM824

1		ruby	Min	Max	Туре	Protect
1.	6	RAVENNA				
1.	6.1	PTP				
1.	6.1.1	Configuration + Control				
1.	6.1.1.1	Domain	0	9	1	r
1.	6.1.1.2	Prio 1	0	255	1	r
1.	6.1.1.3	Prio 2	0	255	1	r
1.	6.1.1.4	Master Announce Interval	0	4	1	r
1.	6.1.1.5	Master Sync Interval	0	2	1	r
1.	6.1.1.6	Master TTL	0	10	1	r
1.	6.1.1.7	Slave only	0	1	В	r
1.	6.1.1.8	Delay Mechanism	0	1	1	r
1.	6.1.1.9	DSCP	0	255	1	r
1.	6.1.1.10	Slave WAN Mode	0	1	В	r
1.	6.1.2	Global Data				
	6.1.2.1	PTP Mode			U	r
	6.1.2.2	Active Clock IP Address			U	r
1.	6.1.2.3	Active Clock ID			U	r
1.	6.1.2.4	Grandmaster Clock ID			U	r
1.	6.1.3	Slave-Only Engine				
1.	6.1.3.1	Time Difference			U	r
	6.1.3.2	Clock Correction Value			U	r
1.	6.1.3.3	Status			U	r
1.	6.1.3.4	Stability			U	r
1.	6.1.3.5	Sync Interval			U	r
1.	6.1.3.6	Servo Window Size			U	r
1.	6.1.4	Master-Slave Engine				
1.	6.1.4.1	Status			U	r



1				ruby	Min	Max	Туре	Protect
1. 6	6			RAVENNA				
1. 6	6.	1 .	. 4 . 2	Own Clock ID			U	r
1. 6	6.	2		Devices				
1. 6	6.	2	. 12	ra01				
1. 6	6.	2		Parameters				
1. 6	6.	2		Hostname			U	r
	<u>6</u> .	2		IP Address			U	r
	5. 5.	2		Netmask			U	r
	<u>5</u> . 6.			RTSP Port	0	65535		
	_		<u>1.2.1.4</u>		-			r
1. 6	6.	Ζ.	. 12 . 1 . 5	Sample Rate	4410 0	48000		r
1. 6	6.	3		Core				
1. 6	6.	3.	. 1	Inputs				
1. 6	6.	3.	. 1 . 1n	Ravenna Core Input name				
1. 6	6.	3.	. 1 . 1n. 1	Туре	0	6	ER1	r
1. 6	6.	3.	. 1 . 1n . 2	Devices			U	r
1. 6	6.	3.		mDNS Channels			U	r
	6.	3.		SAP Channels			U	r
1. 6		3.		Codec	0	4	ER2	r
	5. 5.	3.		Samples per Frame	0	128		r
1. 6		3.		Source No.	0	128		r
				SDP	0	120	U	
1. 6		3.					-	r
	6.	3.		RTSP URL 0			U	r
1. 6		3.		RTSP URL 1			U	r
1. 6	6.	3.	. 1 . 1n. 11	Active	0	1	В	rw
1. 6	6.	3.		Stream Name			U	rw
1. 6	6.	3.	. 2	Outputs				
1. 6	6.	3.	. 2 . 1n	Ravenna Core Output name				
1. 6	6.	3.	. 2 . 1n . 1	Туре	0	6	ER1	r
1. 6	6.	3.	. 2 . 1n . 2	Flags			U	r
1. 6	6.	3.	. 2 . 1n . 3	Default Stream Name			U	r
1. 6	6.	3.	. 2.1n. 4	Assigned Stream Name			U	r
1. 6	6.	3.		Destination No.	0	128	I	r
1. 6		3.		SDP			U	rw
1. 6		3.		Stream Destinations				<u> </u>
1. 6		3.		Dst n				
_	_		. 4 . 1n . 1		0	6	ER1	<u> </u>
				Type	-	0		r
	6.	3.		Remote Stream No.	0			r
	6. c	3.		Remote Stream Name	<u> </u>	<u> </u>	U	r
	6.	3.		Codec	0	4	ER2	
	6.	3.		Samples per Frame	0	128		r
	6.	3.		Time Offset	0	32000	Ι	rw
1. 6	6.	3.	. 4 . 1n . 7	Tracks			U	r
1. 6	6.	3	. 4 . 1n . 8(9)	Statistics primary (secondary) Device				
1. 6	6.	3.	. 2 . 1n . 8(9) . 1	1 Total_packet Count	0	214748364	I.	r
1. 6	6.	3.	. 2 . 1n . 8(9) . 2	2 Early Packet Count	0	7 214748364 7	I	r
1. 6	6.	3.	. 2 . 1n . 8(9) . 3	3 Late Packet Count	0	7 214748364 7	1	r
1. 6	6.	3.	. 2 . 1n . 8(9) . 4	4 Misordered Packet Count	0	214748364 7	I	r
1. 6	6.	3.	. 2 . 1n . 8(9) . 5	5 Buffer Margin Minumum			U	r
	6.	3.				I	U	r
	5. 5.	3.			0	2048	1	r
	5. 5.	3.		Statistics Both Device		2040	<u> </u>	<u> </u>
	_				0	214748364	,	<u> </u>
1. 6	υ.	3.	. 2 . 1n . 10 . 1	1 Timeout Count	0	214148364		r



ruby			Туре	Protect
1. 6 RAVENNA				
		7		
1. 6. 3. 2. 1n. 10. 2 FSM State	0	8	1	r
1. 6. 4 Remote Nodes				
1. 6 . 4 . 1n Node Name				
1. 6. 4. 1n. 1 IP Address			U	r
1. 6. 4. 1n. 2 Flags			U	r
1. 6. 4. 1n. 3 TTL	0	240	I	r
1. 6. 5. Remote Streams				
1. 6 . 5 . 1n Stream Name				
1. 6 . 5 . 1n. 1 Type	0	6	ER1	r
1. 6. 5. 1n. 2 Devices			U	r
1. 6. 5. 1n. 3 mDNS Channels			U	r
1. 6. 5. 1n. 4 SAP Channels			U	r
1. 6. 5. 1n. 5 Flags			U	r
1. 6. 5. 1n. 6 TTL	0	240	- 1	r
1. 6. 5. 1n. 7 Codec	0	4	ER2	r
1. 6. 5. 1n. 8 Samples per Frame	0	128	- 1	r
1. 6. 5. 1n. 9 RTSP Port	0		- 1	r
1. 6. 5. 1n. 10 MCast IP Address 0			U	r
1. 6. 5. 1n. 11 MCast IP Address 1			U	r
1. 6. 5. 1n. 12 Destination No.	0	5000	- 1	r
1. 6. 5. 1n. 13 Destination Name			U	r
1. 6. 5. 1n. 14 SDP			U	r
1. 6. 5. 1n. 15 RTSP URI 0			U	r
1. 6. 5. 1n. 16 RTSP URI 1			U	r
1. 6. 6 Timestamps				
1. 6. 6. 1 Node List Update Timestamp	0	7465596	1	r
1.6.6.2     Stream List Update Timestamp	0	7465596	1	r
1. 6 . 7 Functions				
1. 6 . 7 . 1 Output Connect		RAVE	NNA	
1. 6 . 7 . 2 Remote Nodes List		Functior	n Tab	ble
1. 6. 7. 3 Remote Streams List				

Output Connec	t				
Con	nects RAVENNA Output t	to stream			
Argı	uments	Туре	allowed		
	Output No.	I	existing Output Nos		
	Remote Stream No.		use No. or Name		
	Remote Stream Name	U	use No. of Name		
Resu	ults				
	Result	I			
	0 Success				
	1				
	2				
	3 Output not found				
	4				
	5				
	6				



Remote Nod			
	ists selected Remote Node		-
4	Arguments	Туре	allowed
	Previous Node No.		
	Name Filter	U	
_	From Timestamp	I	
F	Results		
	Result	I	
	0 Success		
	1		
	2		
	4		
	5		
	Node Name	<u> </u>	
	Node No.	I	
	Actual Timestamp	I	
Remote Stre	ava Liet		
	ists selected Remote Strea	ma	
	Arguments	Туре	allowed
Í	Previous Stream No.		
	Stream Name Filter	U	
	Node Name Filter	U	
	Stream Type Filter		
	From Timestamp		
	Results	<u>I</u> '	
ĺĺ	Result	1	
	0 Success		
	1		
	2		
	4		
	5		
	5 Stream Name	U	
	5 Stream Name Stream No.	U	

## 7.5.5 IO Cards

EIO1	Input	Card Type	EIO3	Input	Mic Gain fixed
		Cnone			0Off
		1Mic / Line			1-20 dB
		2Line In			2-25 dB
		3Line Out			3-30 dB
		4Studio I/O			4-35 dB
		5AES3 In/Out			5-40 dB
		6MADI			6-45 dB
		Type Mismatch			7-50dB





EIO2	Input	Туре	EIO3
		Onone	
		1Mic	
		2Line In	
		3Line Out	
		4AES	

Input	Mic Gain fixed
8	-55 dB
9	-60 dB
10	-65 dB
11	-70 dB

1		ruby	Min	Мах	Туре	Protect
1. 7		IO Cards				
1. 7. 1.	.8	Slot No.				
1. 7. 1.	.8.1	Card Type	0	7	EIO1	r
1. 7. 1.	.8.2	Parameters				
1. 7. 1.	.8.2.	1 Product ID			U	r
1.7.1.	.8.2.	2 Serial Number			U	r
1.7.1.	.8.2.	3 Hardware Revision			1	r
1.7.1.	.8.2.	4 Firmware Version			U	r
1.7.1.	.8.2.	5 Firmware Compile Date			U	r
1.7.1.	.8.2.	6 Card Temperature			U	
1.7.1.	.8.2.	7 Card Temperature High Limit			U	
1.7.1.	.8.2.	10 Channels				
1.7.1.	.8.2.	10 18 Channel No.				
1.7.1.	.8.2.	10 18.1 Туре	0	4	EIO2	r
1.7.1.	.8.2.	10 18 2 Core connected			В	r
1.7.1.	.8.2.	10 18 5 Mic Parameters (read only if Core connected)				
1.7.1.	.8.2.	10 _ 18 . 5 _ 1 In Gain [dB]	-30	18	I	r(w)
1.7.1.	.8.2.	10 18 5 2 Mic Gain [dB]	0	70	С	r(w)
1.7.1.	.8.2.	10 18 . 5 3 Mic Gain fixed	0	11	EIO2	r
1.7.1.	.8.2.	10 18 . 5 4 Phantom			В	r(w)
1.7.1.	.8.2.	10 18 5 5 Phantom fixed			В	r
1.7.1.	.8.2.	10 18 5.6 Pad 20dB			В	r(w)
1.7.1.	.8.2.	10 18 5 7 Rumble	0	3	E1S	r(w)
1.7.1.	.8.2.	10 18 6 Line In Parameters				
1.7.1.	.8.2.	10 _ 18 . 6 _ 1 In Gain [dB]	-30	18	I	rw
1.7.1.	.8.2.	10 18 6 2 Rumble	0	3	E1S	r(w)
1.7.1.	.8.2.	10 18 7 Line Out Parameters				
1.7.1.	.8.2.	10 18 7 1 Out Gain [dB]	-30	18	1	rw
1. 7. 1.	.8.2.	10 18 . 8 AES Parameters				
1. 7. 1.	.8.2.	10 . 18 . 8 . 1 In Gain [dB]	-30	18	1	rw
1.7.1.	.8.2.	10 18 8 2 Out Gain [dB]	-30	18	I	rw
1.7.1.	.8.2.	10 18 8 3 Disable SRC			В	rw
1. 8		GPIO Card				
1.8.1.	.8	GPIO No.				
1.8.1.	.8.1	Input	0	1	I	r
1.8.1.	.8.2	Output (read only if Core connected)	0	1	1	r(w)
1.8.1.	.8.3	Core connected (Output)	0	1	В	r

## 7.5.6 System

1				ruby	Min	Мах	Туре	Protect
1.	29			System				
1.	29.	1		System States ( No function for powercore)				
1.	29.	1 .	1	System Type	0	3	EM2	r
1.	29.	1	2	M2 Mode	0	3	EM3	r
1.	29.	1	3	Card Position	0	1	EM4	r



1					ruby	Min	Max	Туре	Protect
1. 29					System				
1. 29.	1	4			Card State	0	5	EM5	r
1. 29.	2				Sampling + Levels (only adjustable for AP IO Node License)				
1. 29.	2	. 1			Sampling Rate	0	1	EM6	r(w)
1. 29.	2	. 2			Analog Ref. Level [dBu]	12	24	Ι	r(w)
1. 29.	2	. 3			Relative System Level [dBFS]	-45	-18	Ι	r(w)
1. 29.	2	. 4			Digital Ref. Level [dBFS]	-27	0	Ι	r(w)
1. 29.	3				Sync (only adjustable for AP IO Node License)				
1. 29.	3	. 1			Prio Sequence	0	5	EM7	r(w)
1. 29.	3	. 2			РТР				
1. 29.	3	. 2		1	Enabled			В	r(w)
1. 29.	3	. 2		2	Present			В	r
1. 29.	3	. 2		3	Active			В	r
1. 29.	3	. 3			MADI				
1. 29.	3	. 3		1	Enabled			В	r(w)
1. 29.	3	. 3		2	Present			B	r
1. 29. 1. 29.	3	. 3	_	3	Active			В	
		<u> </u>	•	3				D	r
1.29.	3	·	_	1	WordClock				
1.29.	3	. 4		1	Enabled			В	r(w)
1. 29.	3	. 4		2	Present			В	r
1. 29.	3	. 4		3	Active			В	r
1. 29.	3	. 5			Internal				
1. 29.	3	. 5		1	Enabled			В	r(w)
1. 29.	3	. 5		2	Present			В	r
1. 29.	3	. 5		3	Active			В	r
1. 29.	4				Voltages				
1. 29.	4	. 1			Main Input Voltage (12V)				
1. 29.	4	. 1		1	Actual Value			U	r
1. 29.	4	. 1		2	Low Limit			U	r
1. 29.	4	. 1		3	High Limit			U	r
1. 29.	4	. 2	_		Aux Input Voltage (12V)				
1. 29.	4	. 2	_	1	Actual Value			U	r
1. 29.	4	. 2	_	2	Low Limit			U	r
1. 29.	4	. 2	_	3	High Limit			U	r
1. 29.	4	. 2 . 3			Board Voltage 1 (3.3V)			0	· ·
1. 29. 1. 29.		. <u> </u>	_	1	Actual Value			U	
	4			1		_		-	r
1. 29.	4	. 3		2	Low Limit			U	r
1. 29.	4	. 3	_	3	High Limit			U	r
1. 29.	4	. 4	_		Board Voltage 2 (1.8V)				
1. 29.	4	. 4	_	1	Actual Value			U	r
1. 29.	4	. 4	_	2	Low Limit			U	r
1. 29.	4	. 4	_	3	High Limit			U	r
1. 29.	4	. 5	_		Board Voltage 3 (1.35V)				
1. 29.	4	. 5		1	Actual Value			U	r
1. 29.	4	. 5		2	Low Limit			U	r
1. 29.	4	. 5		3	High Limit			U	r
1. 29.	5				Currents				
1. 29.	5	. 1			DCDC 12V Input Current				
1. 29.	5	. 1		1	Actual Value			U	r
1. 29.	5	. 2		_	DCDC 3.3V Output Current				
1. 29. 1. 29.	5	. 2		1	Actual Value			U	r
	5	<u> </u>	_	1	DCDC 0.9V Output Current				
1. 29.			_	1					
1. 29.	5	. 3	•	1	Actual Value		——	U	r
1. 29.	6				Temperatures				
1. 29.	6	. 1	_		FPGA Chip Temperature				
1. 29.	6	. 1		1	Actual Value			U	r



1						ruby	Min	Max	Туре	Protect
1.	29					System				
1.	29	. 6		1	. 2	High Limit			U	r
1.	29	. 6		2		Bord Temperature				
1.	29	. 6		2	. 1	Actual Value			U	r
1.	29	. 6		2	. 2	High Limit			U	r
1.	29	. 6	•	3		Fan Temperature				
1.	29	. 6		3	. 1	Actual Value			U	r
1.	29	. 6		3	. 2	High Limit			U	r
1.	29	. 6		4		DCDC Temperature				
1.	29	. 6		4	. 1	Actual Value			U	r
1.	29	. 6		4	. 2	High Limit			U	r
1.	29	. 7				Fan Speeds				
1.	29	. 7		1		Fan 1 Speed				
1.	29	. 7		1	. 1	Actual Value			U	r
1.	29	. 7		1	. 2	High Limit			U	r
1.	29	. 7		2		Fan 2 Speed				
1.	29	. 7		2	. 1	Actual Value			U	r
1.	29	. 7		2	. 2	High Limit			U	r
1.	29	. 7		3		Fan 3 Speed				
1.	29	. 7		3	. 1	Actual Value			U	r
1.	29	. 7		3	. 2	High Limit			U	r
1.	29	. 7		4		Fan 4 Speed				
1.	29	. 7		4	. 1	Actual Value			U	r
1.	29	. 7		4	. 2	High Limit			U	r

E3

## 7.5.7 Enumerations (Sources & Sums)

E1S	Mic	Rumble
		0off
		140Hz
		280Hz
		3140Hz
E1C	Mic	Rumble
		0off
		1on
E2	Input	LR Mode
2	input	Ostereo
		1r -> b
		2side
		3
		4l -> b
		5mono
		6ms -> xy
E3	EQ	Frequency
		020Hz
		122Hz
		225Hz
		328Hz
		431Hz
		535Hz

EQ		Frequency
	21	224Hz
	22	250Hz
	23	280Hz
	24	315Hz
	25	355Hz
	26	400Hz
	27	450Hz
	28	500Hz
	29	560Hz
	30	630Hz
	31	710Hz
	32	800Hz
	33	900Hz
	34	1kHz
	35	1k12Hz
	36	1k25Hz
	37	1k4Hz
	38	1k6Hz
	39	1k8Hz
	40	2kHz
	41	2k24Hz
	42	2k5Hz
	43	2k8Hz
	44	3k15Hz



E3	EQ	Frequency
		640Hz
		745Hz
		850Hz
		956Hz
		10 <mark>6</mark> 3Hz
		1171Hz
		1280Hz
		1390Hz
		14100Hz
		15112Hz
		16125Hz
		17140Hz
		18160Hz
		19180Hz
		20200Hz

453k55Hz
464kHz
474k5Hz
485kHz
495k6Hz
506k3Hz
517k1Hz
528kHz
539kHz
5410kHz
5511k2Hz
5612k5Hz
5714kHz
5816kHz
5918kHz





E4	EQ Band 1	Mode	E9	Gate	Release Time
		0High Pass		Limiter	Release Time
		1Low Shelve		Compressor	Release Time
<b>FF</b>	FO David 2.4		<b>-</b>	Automix	Speed
E5	EQ Band 2-4	<b>Q</b> 00.7	-4		010ms
					125ms
		11.0			250ms
		22.0			3100ms
		33.0	-4		4200ms
		44.0	-4		5300ms
		55.0	_ <b>J</b>		6400ms
E6	EQ Band 5	Mode			7500ms
		OLow Pass			8600ms
		1High Shelve			9700ms
			╡		10800ms
E7	Compressor	Ratio	-4		11900ms
		01:1	-4		121000ms
		11:1.12	-41		132500ms
		21:1.25	-4		145000ms
		31:1.4			
		41:1.8	E10	Expander	Ratio
		51:2.4			01:1
		61:3.4	_		11:0.9
		71:5	<b>-</b>		21:0.8
		81:8	<b>-</b>		31:0.7
		91:16			41:0.6
E8	Gate	Attack Time	<b>-</b>		51:0.5
20	Compressor	Attack Time	-1		61:0.4
	compressor	00.16ms	-1		71:0.3
		10.32ms	-1		81:0.2
		20.64ms			91:0.1
		31.28ms	E11	DeEsser	Mode
		42.56ms	┥└**	Delssei	Ofemale
		55.12ms	-1		1male
		610.2ms	┥╘━━━━	I	
		720.5ms	E12	Aux	State
			-1		Ooff
		841ms 982ms	-4		1pre fader
		3021115	<b>_</b> ]		2post fader



E13	LED	color
	0	black
	1	red
		green
	3	yellow
	4	white
	5	blue
	6	magenta
	7	cyan

E14	Audio	Туре	
		0None	
		1Mono	
		2Stereo	
		3Surr. 5.1	
		4Surr. 5.1+2	
F15	Source	Class	
E15	Source	<b>Class</b> 0 <mark>Audio</mark>	
E15	Source	<b>Class</b> CAudio 1 ProTools	
E15	Source	0Audio	
E15	Source	OAudio 1ProTools	



# 8. Glossary

48kHz or 44.1kHz	See Sample Rate.
Access	On Lawo consoles, much of the source parameter operation is performed by selecting a fader strip. This is otherwise known as putting a source 'in access'.
Attack Time	In the context of dynamics processing (compressor, limiter, gate or expander), the attack time defines the duration over which an input signal is measured. The longer the attack time, the slower the processor will react. For example, when using a gate, a fast attack time causes the gate to open quickly when signal exceeds the gate threshold.
Aux	Auxiliary
	An Aux is a general purpose mono, stereo or multi-channel summing bus which can be used for a variety of applications such as sending to outboard effects devices.
Aux Send	Auxiliary Send
	Source channels feed onto each aux via their Aux Send. The aux send from each channel can be either pre or post fader and has variable level control.
Aux Master	Auxiliary Master
	The Aux Master is a master source channel used to control the level and processing of the Aux output. The direct output of the Aux Master is the signal routed to the outboard effects send.
Aux Return	Auxiliary Return
	The Aux Return is the name given to the return channel from the outboard effects device. This channel controls the level and processing of the effect as it is summed into the rest of the mix.
Band Pass Filter	See Filters.
Balance	Balance is applied to the input of a stereo channel and is the ratio between the left and right input levels. When Balance is set to its default value, the level of left and right inputs are equally weighted.
Bargraph	An optical display instrument in the shape of a LED bar for displaying signal level.
Clean Feed	See Mix Minus.
Compressor	A dynamics processor used to smooth out uneven signal levels. For example, when a presenter shouts and then whispers, they are producing sound which has a wide dynamic range; one moment it is very loud and the next very quiet. This can mean that if we listened to this signal on our radio without compression, we would forever be turning the level up and down! A compressor smooths the signal such very loud audio is reduced in level and very quiet audio is increased in level. This results in smaller dynamic range ideal for radio transmission.
Configuration	The system configuration is a file created by the Configuration Tool software. This file is then transferred to the console's system unit where it is then loaded every time the console powers on. The configuration defines key elements of the system such as sources, summing busses, signal processing, MF Key functions.
DALLIS	Lawo's modular IO interfacing system based on 19" frames using plug-in cards for different interfaces.
dB	deciBel
	A unit of transmission giving the ratio of two powers.
	The number of bels is the logarithm to the base 10 of the ratio of the two powers. One decibel equals one tenth of a bel.
dBu	dBu is used to describe levels within the analogue domain, and is a measure of absolute voltage level based on 0dBu = 0.775 Volts (RMS). dBu is often used to indicate nominal broadcast operating levels. For example, in the EBU normal broadcasting level = +6dBu.



dBFS	dB Full Scale
	dBFS is used to describe levels within the digital domain. 0dBFS describes the system's internal clipping point; this is the maximum level which may be handled by the system without signal distortion. For example, your system may be set for +18dBu = 0dBFS. If your normal broadcast level is +6dBu then this leaves an operating headroom of 12dB.
Delay	The signal output from a delay module is x ms behind the signal input to the module. Delay is often applied to audio sources whose video has undergone digital video processing; delay is required such the audio remains in sync with the video.
Direct Out	Direct Output
	The direct output of a source channel is the output of the individual source. Direct Outputs are often used to provide a record or 'snoop' feed of a single source, and may be taken from various points within signal flow: pre fader, post fader, etc.
DSP	Digital Signal Processing Digital signal processing (DSP) is the study of signals in a digital representation and the processing methods of these signals. Within <b>ON-AIR Designer</b> , DSP is also used as the collective name given to the processing chips, within the system unit's Master Board, which provide audio signal processing such as equalization, dynamics and delay.
Dynamics	Dynamics is the collective terms given to audio processing which responds to changes in signal level. For example, a Compressor, Limiter, Gate or Expander.
EQ	Equaliser.
	An equaliser is a processor which changes the frequency characteristics of a signal, for example to increase the amount of treble or bass components in the signal.
Expander	A dynamics processor used to magnify changes in the dynamic range of the input signal. For example, to reduce noise in speech pauses. See also Compressor.
Fader	A potentiometer used to adjust the gain of a signal.
Filters	Filters are equaliser sections which are used to cut out or reduce specific frequency bands within the signal. For example, a Low Pass Filter cuts out high frequencies so will result in less treble to the sound. A High Pass Filter cuts out low frequencies, for example you may use this to remove unwanted low frequencies like hum or rumble. A Band Pass Filter cuts out both high and low frequencies allowing frequency components within the band to pass through the signal; for example, you may use this type of filter to create a telephone effect on a normal voice.
Gain	Adjusting the gain of a signal results in a change in the perceived level or amplitude. An increase in gain (positive values) results in amplification and a reduction in gain (negative values) in attenuation.
Gate	A dynamics processor used to remove unwanted signals below a certain threshold level. For example, if a gate is applied to a presenter's microphone source, then when they speak signal level exceeds the gate threshold and the gate opens, while if they make a low level sound, like shuffling in their seat, the gate remains closed. The result is that only the signal we want to hear is output from the source channel!
GPI	General Purpose Interface (IEEE488) is a standardised platform independent short- range digital interface, to allow switching connections between broadcast equipment from different manufacturers.
Headroom	The amount of operating level which is in reserve between normal operating level and 0dBFS.
High Pass Filter	See Filters.
Insert Point	A connection point within the source channel which interrupts the signal flow and routes out to a piece of external equipment and returns back to the source channel. Insert send = route out from the source channel to the external device. Insert return = input to the source channel from the external device.



Limiter	A dynamics processor used to stop signals exceeding a certain threshold level. For example, you may place a limiter across the main output of the programme to prevent a sudden increase in level exceeding the clipping point of your transmission feed and causing signal distortion.
Low Pass Filter	See Filters.
Mix Minus	Mix Minus, Clean Feed and N-1 are all terms used to describe a feed which is created from a number of channels minus a particular channel or channels. For example, to provide telephone hybrids with a feed of the programme minus the incoming phone call.
MF Key	Multi Function Key
	Programmable keys which can be used for a variety of functions as set in the console's configuration.
Module	On Lawo's radio on-air consoles, this term can be used to refer to the control surface modules or the different sections of signal processing (EQ, Dynamics, etc.)
Monitor	Term used to describe the outputs and functionality of feeds to loudspeakers or headphones for the purpose of listening to a mix.
ms	milliseconds
	Unit of time measurement.
M-S	Middle and Side Stereo
	Used to describe an arrangement of two coincident microphones, one pointing to the front (Middle) and the other (bidirectional) at right angles providing a Side signal. <b>crystal</b> and <b>sapphire</b> provide M-S to X-Y decoding to turn the Middle and Side signal into normal Left and Right stereo.
Nova17	A stand alone routing matrix with networking capabilities; the name given to the <b>sapphire</b> system unit without a control surface.
Nova29	A stand alone routing matrix with networking capabilities; the name given to the Compact Engine without a control surface.
Nova73	A stand alone routing matrix with networking capabilities; this is a large matrix related to the mc <sup>2</sup> series of Lawo consoles.
N-1	See Mix Minus.
On-Air	Term used to indicate that a radio or TV programme is being broadcast.
Overload	Occurs when the signal level is too large for the system, resulting in signal distortion.
Panning	Used to control the left/right position of a mono source when routed to a stereo or multi-channel output. For example, if a source is panned left, the entire signal from the source is routed to the left side of the summing bus. If a source is panned centre, equal levels are applied to the left and right sides of the summing bus, etc.
PFL	Pre Fade Listen
	Used to listen to signals before the application of fader level. Provides a way of listening to a source when the fader is closed to check its signal before the fader is opened to route it onto the programme output.
Phantom Power	This is the power supply required when working with condenser microphones. The console supplies 48V to the microphone via the audio connector.
Programme	The main output of a live broadcast console. This is the mix which feeds the transmission chain.
RAS	Radio Automation System control protocol is Lawo's universal protocol for communication between a mixing console (MIXER) and a radio automation system (RAS).
Ratio	In the context of a compressor or expander, the ratio defines how much compression or expansion is applied. For example, the high the compressor ratio, the more signal levels above the compressor threshold will be compressed.



Release Time	In the context of dynamics processing (compressor, limiter, gate or expander), the release time defines the time taken for the action of the processor to subside. For example, when using a gate, a short release time will cause the gate to close quickly after signal falls below the gate threshold.
Remote MNOPL	The remote control protocol RemoteMNOPL is a LAN based client-server network byte order protocol to enable third party systems to control Lawo's digital mixing consoles or standalone routers.
Roll-off Frequency	See Shelving EQ.
Routing	Signal Routing Term used to describe the connection made between an input and output.
RS422	A type of serial interface used for communication with external devices such as radio automation systems.
Rumble Filter	Name given to the High Pass Filter which can be inserted in the analogue microphone preamplifier. Used to cut out or reduce unwanted low frequencies, such as rumble, before analogue-to-digital conversion.
Sample Rate	The speed at which the internal processing of the system takes samples respective to values from a continuous, analogue audio signal to make a discrete, digital one. For example, when running at 48kHz, incoming analogue audio is sampled at a rate of 48000 values per second.
Shelving EQ	A shelving equaliser band is used to increase or decrease high or low frequency components of a signal. The slope of the shelf defines how steeply the gain increase/decrease is applied. The roll-off frequency defines the frequency at which signal level is reduced by 3dB.
Slope	See Shelving EQ.
Source	In Lawo's radio on-air consoles, this term describes a channel with input signal assignment, DSP and other attributes (MF Keys, control triggers, etc.) A source becomes active once it is assigned to a fader channel.
	Different to "Input" - the term for an audio input signal (i.e. the physical interface).
Sum	Summing Bus The result of several audio signals mixed together within the console.
Telephone Hybrid	Device which deals with bi-directional signals to/from a 2-wire phone line. One line provides an incoming feed from the phone line (e.g. the guests voice), and the other sends signal back to the receiver (e.g. the mix minus feed).
Threshold	In the context of dynamics processing (compressor, limiter, gate or expander), the threshold defines the signal level at which the processor starts to act. For example, the gate threshold sets the level at which the gate will open and then close.