TiMax SoundHub

User Manual

November 2026

Evolutionary Immersive Audio

and Showcontrol

hear the sound not the system

ultraspatial audio

total control | total immersion



Index

Index 3

What is TiMax 7

Quick Start 8

Hardware 9

System Block Diagram 10

Audio Inputs & Outputs 11
- Analogue I/O interface (AIO Cards) 11
- AES3 Digital I/O plus Analogue Output interface (MIO Cards) 12
- MIO AES3 Board Installation & Configuration 12
- MIO AES3 Clocking 13
- Dante Interface 14
- MADI Interface 15

Control Inputs and Outputs 17
- Ethernet 17
- Manual Network Configuration using fixed IP addresses 17
- GPIO Input and Output (Service Use Only) 18
- MIDI 18
- OSC 19

Front Panel Controls 20
- Group Faders, Mute and Solo 20
- Channel Meters & Solos / Mutes 20
- Select a Show 20
- Select a Cue 20
- IP Address 20
- Setup & Information 20
- >>> GET OUT OF JAIL FREE <<< 21

Dual Redundant PSUs 22
- Dual Power Supply and cooling fan 22

Software overview 23
- Overview 23

Getting Started 23

Go into OffLine Edit mode when the program boots 23
Emulate FPGA in Offline Edit Mode 24
High Contrast Interface 24
Don't check show for save when switching units 24
Send GO to all Connected Units 24
Light / Dark Colour scheme 24
Hardware 24
Disk 24
GPIO 24
Stats 24
AES3 24
MIDI 24
MADI 24
Password Protection 25
Show files 25
Show Archive 25

TiMax MCP **26**
What it does 26
Setup time, not show time 26
Built on real knowledge of TiMax 27
How to set it up 27
Connecting to the TiMax2 MCP Server 27
Setting up Claude Code 27
Setting up Claude Desktop 28
Other AI assistants 29
If it does not work 30

Navigation **31**
Main Toolbar Buttons 31
Files Window 32
EQ Library 33
Image Definition Library 34
Cues 35
Groups 37
TimeLine 38
PanSpace 38
Tracking 38
Playback 38
Triggers 38
Live 38
Docking and undocking 38
Output Meters 39

The Mixer **40**
Input and Output control buttons 41
Input Channel controls 42
Source Submix 43
Input Equaliser 43
Matrix 44

Output Channel controls 46
Output Equaliser 46

The Cue List 48
New / Edit Cue dialogue 49
Cue Info 49
MTC Cue Triggers 49
MIDI Note & Prog Cue Triggers 49
Show Clock Cue Triggers 49
Time of Day Cue Triggers 50
Setting Real Time Clock 50
Cue Snapshot 50
Cue Playlist 50
On-Cue Labels 51

Image Definitions 52
Create / Edit Image Definitions on the Matrix 52
Create and Edit Image Definitions using the Image Definition Editor 53
The Image button 53

S Version features 54
Introduction 54
Overview 54

The TimeLine 55
Snapshot and TimeLine event Co-Existence 56
Loading Audio Files to the TimeLine 56
TimeLine Toolbar 58
Transport controls 59
TimeLine display controls 59
Popup tools 59
Audio File Edit and Looping 60
Looping 60
Volume Profiling Mix Automation 60
Panning with Image Definitions 60
Dynamic Pans 61
Changing Pan Law and Timing 61
Select an audio clip and associated automation 62
Mono and Stereo and Multichannel audio 62
MTC Generator Start & Stop 62
Time Linked Cues with the Go Cue command 62

The PanSpace 64
General 64
Venue layer 65
Speaker layer 66
New / Edit Speaker parameter 66
Image Definition layer 67
Image Definition Calculation 68
Spatialisation layer 69
Working with Subspaces 69

Subspaces setup 69
Programming pan Cues 69
Scaling Surfaces 71
Assign Input Objects to Scaling Surfaces 72
Re-Scale the Surfaces 72

OSC Control 73
OSC Connection and Formats 73
Mapping OSC to TiMax functions 73
Tracking in PanSpace - Absolute coordinates 73
Tracking in PanSpace - Normalised coordinates 73
TiMax OSC Type Dictionaries 74
TiMax2 OSC Dictionary 74
Tracker Translate OSC Dictionary 74
ADM-OSC Dictionary 75
ADMix-Player OSC 75

It's about Time ... 76
An introduction to Source Oriented Reinforcement 76
Image Definitions – what are they and how are they set up 78
Using performer stagetracking 79
Principles and practice 80
Typical Signal Flow - Live 82
Typical Signal Flow - Experience 82

TiMax sound design Use-Cases 83
End-on Proscenium Theatre 83
Thrust Stage 84
Outdoor Arena Opera 86
Military Tattoo 87
Orchestral Festival Reinforcement 88
Large-Scale National Event 89
Multi-Zone Immersive Experiential 90

MIDI Specification 91

Hotkeys 92

Conformance 93

Technical Specifications 94

Feature Set 95

What is TiMax

The combination of a versatile object-based spatial audio processor, integrated showcontrol and audio Playback makes the award-winning TiMax SoundHub truly a show-in-a-box solution, with unparalleled functionality for a single self contained unit.

Individual or multiple TiMax units will sit and run shows or immersive installations without any computers attached, day after day and even start up automatically after powering off overnight and back on next day.

TiMax employs unique delay-matrix Image Definition objects which map a stage or space with multiple spatial reference points, then exclusive TiMax real-time delay morphing alogorithms interpolate seamlessly and transparently between them for both static or moving Input source objects.

TiMax calculates these Image Definitions based on the geometric relationships between action zones, speaker positions and audience seating areas, applying user adjustable adaptive level-shading and over-delay parameters to optimise the spatial rendering across an entore stage or space, and at every seat.

Image Definitions can also be manually set up or fine-tuned to taste, and the intuitive task-based Mac and PC software makes for a rapid and straightforward workflow.

This means TiMax automatically tailors immersive spatialisation to the relative positions of performers, loudspeakers and audience. And it does this equally well for any size and shape of stage or audience, employing untypically minimal and flexible speaker system configurations from virtually any brand or type. All while giving you full visibility and agency over every spatial audio parameter, to readily meet extreme sound design challenges or especially creative demands.

A suite of Training Videos are available at the timaxspatial.com website. Links to these will appear in relevant sections of this User Manual**.** You can also select Activate Detailed Onscreen Help from the Help Menu which will give you information on any controls you subsequently click on.

Link to: Introduction Training Video

Quick Start

Versions of TiMax software are available for Mac and PC operating systems. To run the software simply copy the software folder onto your computer hard disk and launch the program by double clicking on the executable. There is no other installation or configuration required. The PC executable should be run from inside the folder containing the necessary dll files.

Connect your Mac or PC to the unit. The communication between the TiMax unit and the controller uses UDP Internet Protocol (IP) which can be wired or wireless. Connect a CAT5 cable from the computer to the unit directly or connect a wireless access point to the CAT5 connector on the unit and control your TiMax via a wireless link.

The default setup for TiMax is for network IP addresses to be assigned by DHCP, your computer TCP/IP Properties should be set to "Obtain an IP address automatically". If no DHCP server is running on your network TiMax will self assign an IP address in the 169.254.xxx.xxx range and the computer should do the same. There is also a fixed IP option.

Launch the TiMax software, select Offline then Select from the list of the "en0" etc network adaptors that appear, a it will find the TiMax unit, show it's name or serial number in the top-left pull-down, and connect automatically. If you see the TiMax unit name or serial number appear in the top left-hand corner of the screen then you are connected and able to control the unit.

If other TiMax SoundHub units are available you'll see their TiMax unit name or serial number in the pull-down and you can select which one to control.

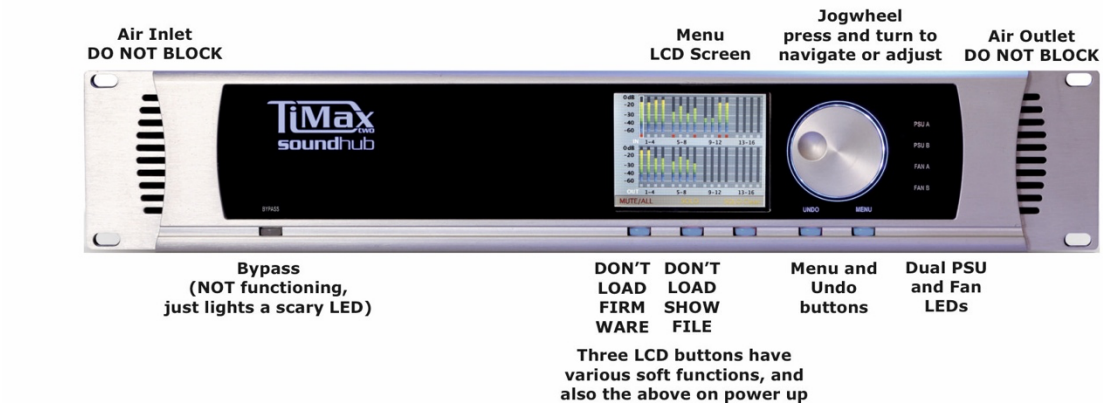
Audio connection to the unit depends on the hardware configuration if the TiMax, multi-channel Dante or MADI audio interfaces are available as standard, with optional analogue and AES3 digital Inputs and Outputs presented on D-Sub connectors.

To create a signal path, open an Input fader, route the signal to the desired Outputs using the matrix and open the Output faders.

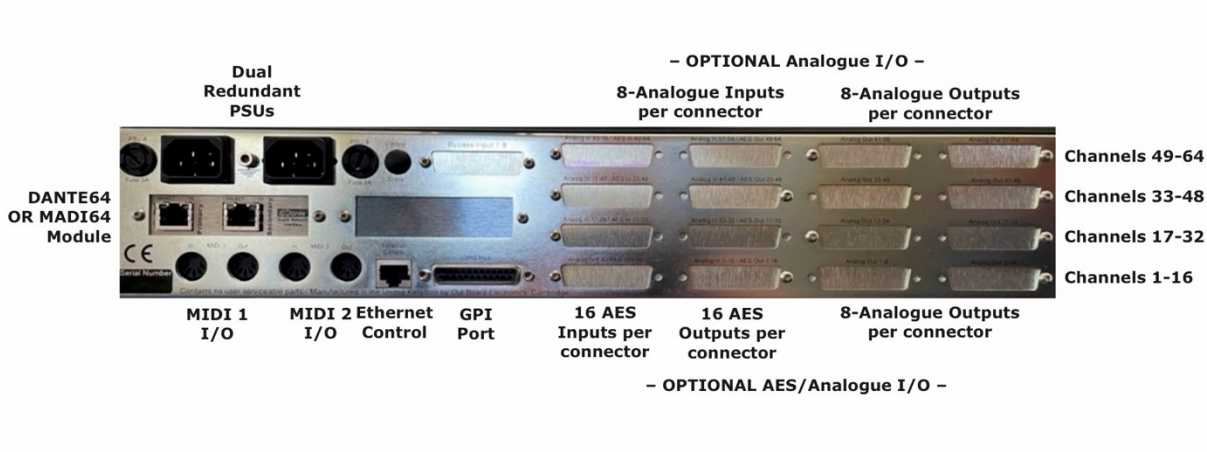
Link to: UI Walkthrough Training Video

Hardware

TiMax SoundHub is housed in a 2U 19” rack mount case. Front panel menu and jog wheel controls allow the operator to select a Show, recall Cues/Snapshots, Mute and Solo Inputs and Outputs, select and adjust Group fader levels, assign DHCP or Static IP and view system Info such as Serial Number and Temperature.



Rear panel I/O and control ports are shown for a standard 32x32 or 64x64 TiMax SoundHub with Dante I/O. MADI is available as an alternative to Dante.



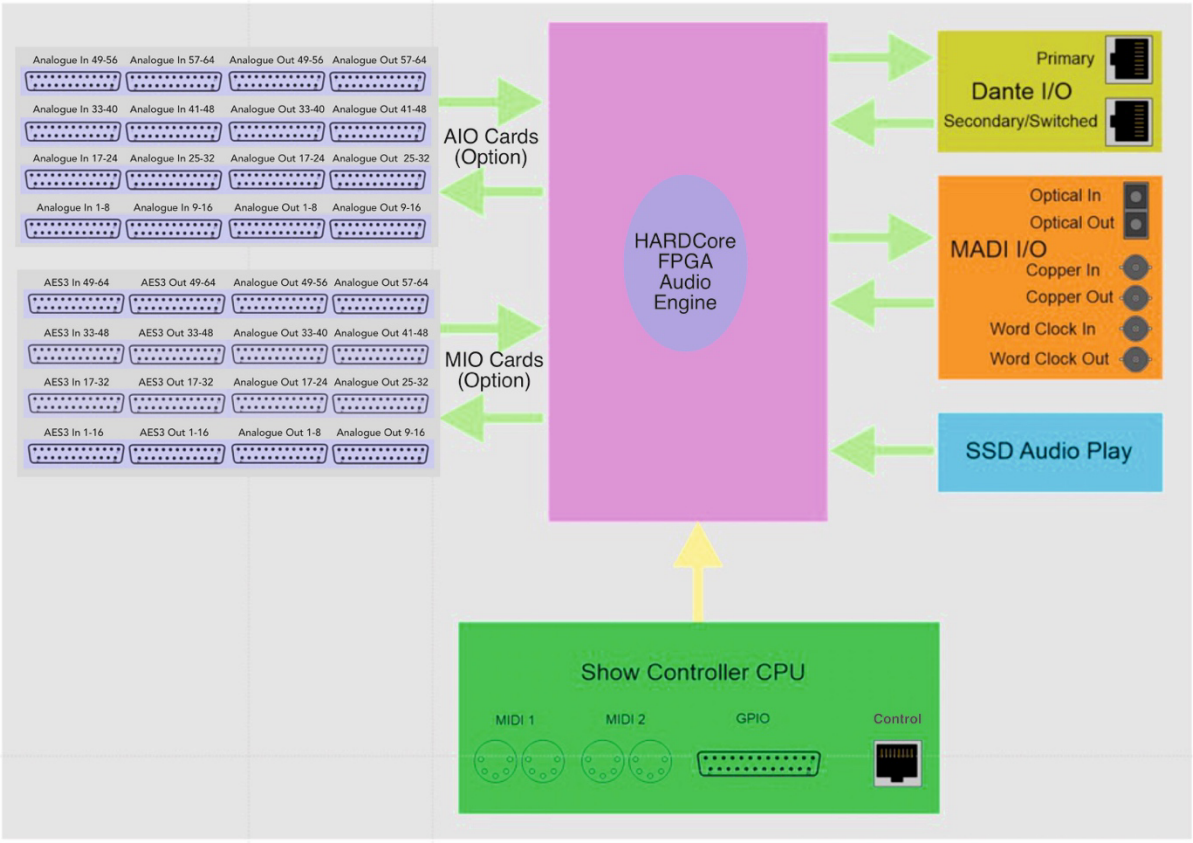
System Block Diagram

The TiMax hardware platform will support:

- One **Dante64** or **MADI64** interface – **<u>either/or (not both)</u>** – for **64x64 at 48KHz** or **32x32 at 96KHz** fitted **as standard**,

and, any combination of up to 4 discrete 16-channel I/O cards

- **AIO Card** (Analogue I/O)
- **MIO Card** (Mixed I/O with AES3 I/O plus Analogue Outputs)

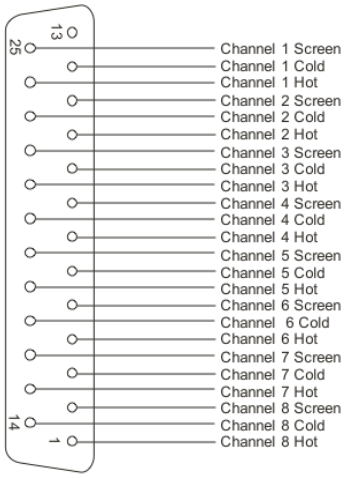


Audio Inputs & Outputs

TiMax SoundHub can support any combination of 16-channel AIO and MIO cards for discrete audio connection as well as Dante **or** MADI for Multichannel transport.

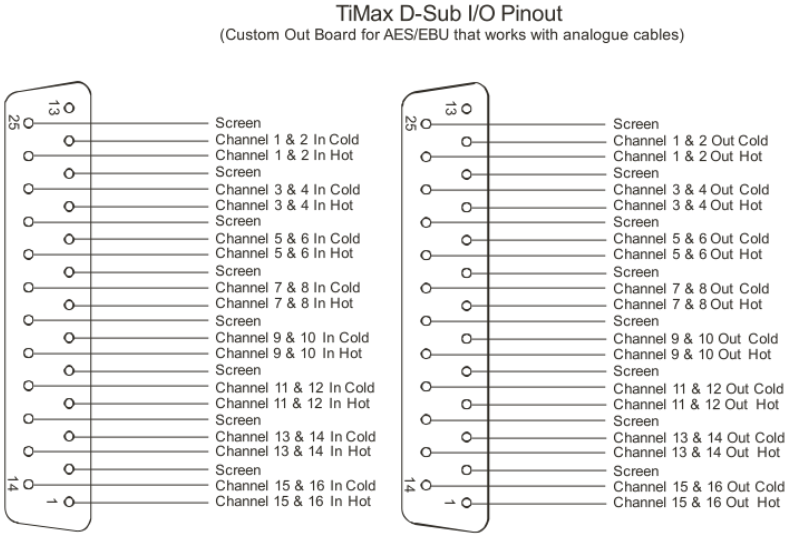
Analogue I/O interface (AIO Cards)
The following is the D-Sub 25-Pin configuration. This pinout is equivalent to Yamaha standard Analogue DB25>XLR cables.

Analogue Input and Output connectors on the TiMax are female and in groups of 8 balanced circuits. D-Sub cable line connectors therefore need to be male for both Inputs and Outputs.



Analogue Audio Input & Output Connection

AES3 Digital I/O plus Analogue Output interface (MIO Cards)
Each chassis female D-Sub carries 16 channels of Input **or** Output (8 stereo pairs) arranged in accordance with the **analogue** pin-out standard. This pinout is equivalent to Yamaha-standard **NB -Analogue Format- NB** DB25>XLR cables.



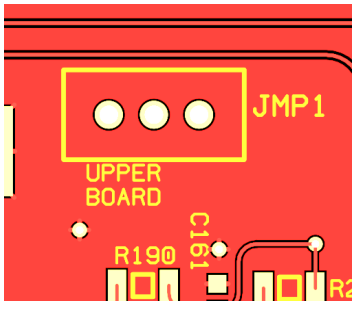
AES3 Digital Audio Input & Output Connection

MIO AES3 Board Installation & Configuration
Each Mixed Input Output (MIO) card has 16-channels of AES3 Input and 16 channels of AES Output as well as 16-channels of analogue Output.

When installing the MIO board, a jumper needs to be placed to select the word clock routing. There can be one to four MIO boards installed in a TiMax SoundHub unit, stacked in the IO board area.

On the uppermost board, the jumper is installed between the **left two** of the three posts at the JMP1 location.

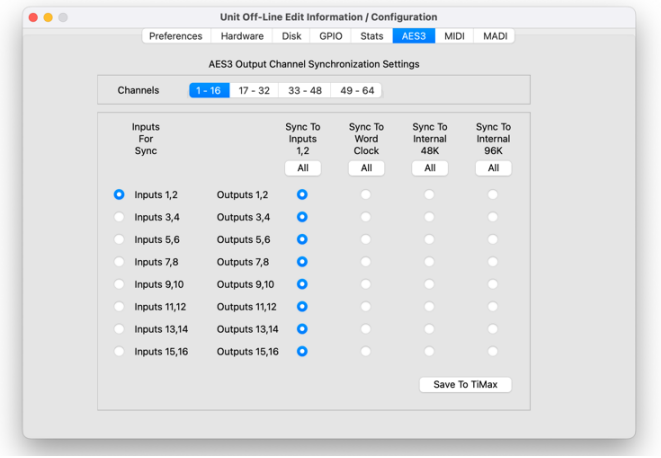
On all lower boards, the jumper is installed between the **right two** posts.



MIO Inputs pass through in Input Sample Rate Converter (SRC) which converts and synchronises incoming Input data to the TiMax internal clock. The SRC capture range includes 44.1KHz, 48KHz and 96KHz, and can be different on adjacent AES Input pairs.

MIO AES3 Clocking

Each pair of AES Outputs can be set to clock to any one of several clock sources including external word clock, internal 48kHz or 96kHz or a clock derived from any one of the Input pairs on the same MIO card.



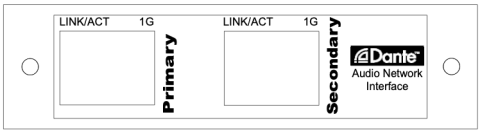
From the Unit menu select Unit Information / Configuration and click on the AES3 tab.

After making the desired Output clocking selection, click Save to TiMax for the selection to become effective.

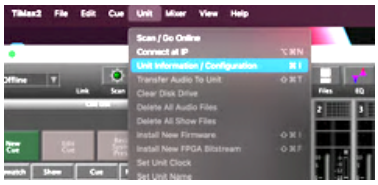
The AES Output clocking is not saved in the show file as this selection is totally dependent on the hardware configuration of the TiMax unit.

Dante Interface

There are 2 Dante Redundant or Switched interface card options available, both have a Primary and a Secondary port that can either be internally switched or form the second leg of a redundant network.



Dante64 – Single Audinate Brooklyn card 64–channel 48kHz or 32 channel 96kHz digital audio transport on CAT 5.



The Dante interface when fitted is automatically detected and will show up in the Unit > Unit Information/Configuration > Hardware Tab when the software is logged on to the TiMax SoundHub.

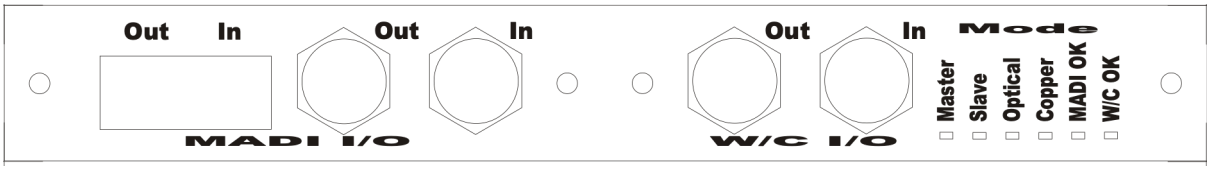
Dante audio signal routing and interface configuration are set through Dante Controller.

Please note that of November 2026, a previous Dante64X variant [Dual Audinate Brooklyn card 64-channel 48kHz & 96kHz digital audio transport on CAT 5] **is no longer available or supported.**

MADI Interface

MADI64 64-channel 48kHz digital audio transport on 75 ohm coax or SC multimode optical connection, **or 32-channel in 96KHz mode**.

The MADI interface is set up through the TiMax software interface, the MADI module can be set to master or slave and 56 and 64 channel format.



LEDs on the MADI card show current status:

Master – TiMax is set to be clock master

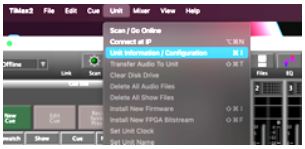
Slave – TiMax is slave to incoming clock

Optical – TiMax is set to receive MADI on the optical Input

Copper – TiMax is set to receive MADI on the copper Input

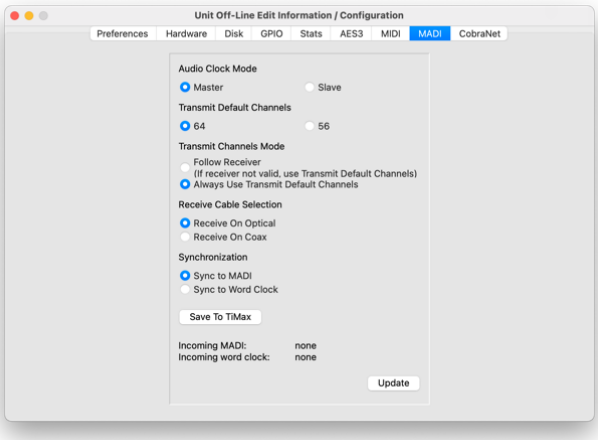
MADI OK – TiMax is detecting an incoming MADI stream

Word Clock OK – TiMax is detecting an incoming word clock



The MADI interface when fitted is automatically detected and will show up in the Hardware list when the software is logged on to the SoundHub.

Select Unit from the menu bar and choose Unit Information / Configuration, click on the MADI tab



Master: TiMax is clock master for the MADI stream, the device on the other end of the MADI connection must be set to Slave.

Slave: TiMax will be clocked from the device on the other end of the MADI connection.

Transmit Default Channels: sets the number of channels transmitted in each MADI frame.

Follow Receiver: MADI Config Tab – Tx Channel Mode – Follow Receiver = This mode detects the number of channels/frame on the MADI receiver and replicates it on the MADI transmitter. E.g.

If MADI RX is 64 Ch, MADI TX will be 64 Ch

If MADI RX is 56 Ch, MADI TX will be 56 Ch

Receive Cable Selection: Choose between copper and optical transport.

Synchronization: Sync to Madi will sync to a clock extracted from the incoming MADI stream, sync to Word Clock will sync to the external word clock signal connected to the external word clock coaxial connector.

After changing settings click **Save to TiMax** for the new settings to take effect.

MADI settings are not saved in the show file as this selection is dependent on the hardware configuration of the TiMax unit.

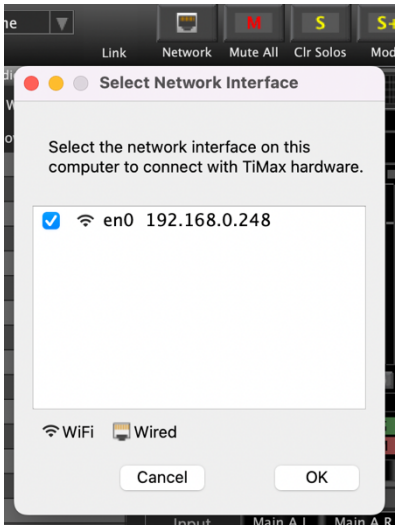
The status of the MADI card is refreshed by clicking on the **Update Status** button. The MADI card status report (None or Valid) is only updated when the Update Status button is clicked.

Control Inputs and Outputs

Ethernet
TiMax communicates with one or more host computers on the local area network via an Ethernet connection. The Ethernet port operates at 100 megabits per second, carrying Internet Protocol (IP) packets that conform to the UDP protocol.

A CAT5 cable is used to connect the network port on the back of TiMax to a port on a switch, hub or router. It is also possible to connect TiMax directly to a host computer's Ethernet port (**most Macs and modern PC computers will work with a standard Ethernet cable**). Cables used must be less than 100 meters in length. Note when using a direct cable connection it may be necessary to turn wireless networking off on the host computer, **especially MacBooks**.

Each TiMax unit has a unique Ethernet MAC (hardware) address programmed into its ROM at the time of manufacture. The TiMax firmware uses this MAC address with the ARP, DHCP and ICMP protocols to establish and maintain connections with host computers on the local area network using IP addresses. The IP address that the TiMax uses may be assigned dynamically by a DHCP server on the network, or manually by the user.



Hit The Ethernet icon on the toolbar and Select one of the PC/Mac's Ethernet ports. If there is no DHCP server present then TiMax will auto-assign ("Auto-Config") an IP address. TiMax will respond to a "ping" request on its assigned IP address.

Manual Network Configuration using fixed IP addresses
There are a number of reasons why you may consider using fixed IP addresses, it is possible that the control computer is connected to TiMax via a Local Area Network (LAN) which is also used for internet access or part of a wider intranet facility and for reasons of access control you wish to limit the visibility of the system to unauthorized wired or wireless access. Using the TiMax front panel controls scroll and press the jog wheel to select IP Address and the scroll wheel and tab key to set the designated address for the TiMax unit, **eg. 192.168.001.100**

The IP address and subnet mask of the control computer will also need to be set in the same range. Refer to your computer network setup in Control Panel/Network Connections

Select the connection type, i.e. wired or wireless, go to the TCP/IP properties and set the address. The Mac Network Preferences window offers similar options.

BEWARE of the following possible reasons for failure to connect:

Windows and anti virus Firewall may prevent connection, turn firewalls off for fault diagnosis.

If your computers' Wired and Wireless TCP/IP settings are in the same range connection can be prevented. Disable the one you are not using for fault diagnosis. **You may need to disable Mac Airport to ensure stable wired Ethernet connection and operation.**

Just wait a few minutes after changing TCP/IP settings, for the new settings to become effective or by restarting the computer.

Another device on the network has the same address as the control computer.

GPIO Input and Output (Service Use Only)
The **General Purpose Input and Output (GPIO)** is included **for Service Use Only, and is not implemented or rated for general customer use.**

MIDI
TiMax has two standard MIDI ports on the rear panel. Input Port 1 is a general-purpose port. Any MIDI-formatted TiMax command, including standard MIDI continuous-controller commands for control of Group Faders from generic MIDI faders, as well as MIDI Program and MIDI Note commands for Cue Recall, can be received on the MIDI 1 IN. See MIDI Specification.

In (**legacy)** TiMax SoundHub-R Versions, the Cue List's Preset/Cue numbers are hard-programmed to trigger from equivalent MIDI Program Change numbers sent to MIDI IN1 on MIDI Channel 1.

In the **(standard)** S-Version, MIDI Note or Program Change triggers can be freely mapped to any values using the New Cue or Update Cue dialogue (more later).

The second MIDI port is for interfacing to legacy "7K" TiMax Tracker performer tracking system or to a console for remote Cue recall by MIDI Program or Note.

The legacy “7K” TiMax Tracker system interface sends MIDI Controller messages to TiMax to automatically recall TiMax Inputs to level/delay Image Definitions when the appropriate MIDI controller signals are sent from a TiMax Tracker computer (see later MIDI Specification)

OSC

TiMax has an extensive and flexible OSC interface allowing control of: Pan Space positions in the x,y and z planes.

Input, Output and group fader levels, Input, Output and group mutes Cue Recall and Stop functions can also be controlled externall via OSC.

Incoming OSC message can be viewed in the View > View OSC Window. Messages in any OSC format can be grabbed and mapped to any of the allowed TiMax functions.

See the main OSC Control section for full details of the OSC interface and different protocol options, including the latest quick to setup ADM-OSC.

Front Panel Controls

Group Faders, Mute and Solo
These are live controls accessible via the front panel of the unit. Press the Menu button, scroll to Groups and press the jog wheel to select. To select a Group to control, scroll to the desired fader and press the jog wheel to select it, then turn the jog wheel right or left to adjust the level up or down, or Mute or Solo using soft keys under the LCD screen.

The channels controlled by a Group fader are assigned in the TiMax PC or Mac control software and may be freely defined in each Show to control any combination of Inputs and Outputs. So for example Group 1 could be setup as a grand master controlling all Outputs, while others may be assigned to control sub zones, announcer mics, DJ, Band or stage sources.

Group assignments and levels will be remembered if TiMax is switched off and on again. Group assignments are stored in a Show, Group **levels are not.**

Group fader levels may be controlled by physical MIDI faders plugged into the rear panel MIDI 1 Input port. After booting up, the unit will respond to an incoming controller message, as sent by a MIDI fader arriving on any enabled MIDI channel, setting the level for the group that corresponds to the controller number in the message (controller #zero beingmapped to the first group). The default is all channels enabled. There is an option in the Store System Preset window to enable a specific MIDI channel; messages from other channels are then ignored.

NB TiMax does not respond to running status MIDI Controller messages.

Channel Meters & Solos / Mutes
Signal levels on each Input and Output can be seen on the front panel LCD, the 16 channel wide display may be scrolled with the jog wheel and Input or Output selected by pressing the jog wheel switch in order to access the Mute and Solo functionsfor each channel. **Note: To mute and un-mute all channels, press and hold the Mute switch.**

Select a Show
Use the jog wheel scroll and press to go to and select a show from the list

Select a Cue
Use the jog wheel scroll to a Cue from the list. Use the Select button to select that Cue and again to recall the next Cue in the list.

IP Address
Allows setting of fixed or DHCP assigned IP addresses. (See P8.- Ethernet)

Setup & Information
Displays unit information such as temperature and Firmware version.

>>> GET OUT OF JAIL FREE <<<
(Cut out and stick on the fridge)

In the rare event of a system crash due to possible Show file corruption or firmware corruption, here are a couple of things to try using **the soft keys under the front panel LCD display**…

DON'T LOAD SHOW FILE FROM DISK – Power-cycle the unit and immediately press the **centre** button under the LCD display for a couple of seconds – this will boot the unit without auto-loading the most recent Show file and display the above message. To re-load the show file select File/Open Show Online, this will upload the show file from the PC or Mac onto the TiMax SoundHub unit.

DON'T LOAD FIRMWARE FROM DISK – Power-cycle the unit and immediately press the **left** button under the LCD display for a couple of seconds – this will boot the unit from ROM, pause the boot-up sequence and display the above message. When the TiMax PC or Mac software is launched you will be prompted to load the version of firmware that is embedded into the control software. This can also be used to roll-back to earlier firmware versions if necessary.

Dual Redundant PSUs

Dual Power Supply and cooling fan
A second power supply and cooling fan is fitted into TiMax for redundant power reliability. The second power supply has its own power cord and fuse.

Each PSU and Fan has a front panel LED indicator which lights up if that PSU/Fan fails or is not connected.

Software overview

Overview
Versions of the software are available for Mac and PC operating systems. The control sofware is based on a client server architecture in which the server is the TiMax SoundHub unit and the computer runs client software.

At least 4 or 5 clients can be connected to a single TiMax unit, potentially more depending on their spec and network capability. Changes made by the operator on any of the client computers will reflect in real time on all the other clients connected. **NB: All clients must run the same TiMax software version.**

All clients have identical rights to edit and save shows in the TiMax unit. Any client Save Show command updates the Show saved on the TiMax unit and on the local client computer's disk drive. Other clients can do their own local Save Show.

Connection may be direct using a Cat5 cable from the control computer to TiMax (older computers may need a cross-over cable) or via a switch or hub on a network using wired or wireless connection.

The software is both a programming interface and a live control surface for one or more TiMax SoundHub units, offering control of up to 64 channels on each unit of Input EQ, Output EQ, level and delay at each matrix crosspoint as well as sound file Playback, spatialisation and sophisticated Cues/Snapshots and dynamic automation.

Getting Started

Software boot-up options can be set in the **Unit** / **Information Configuration** / **Preferences** tab.

The User Preferences get saved to the computer when the software is closed.

Go into OffLine Edit mode when the program boots
When **un-checked** the software connects to TiMax hardware, then loads and displays on the PC/Mac software the show that is currently open in the TiMax unit.

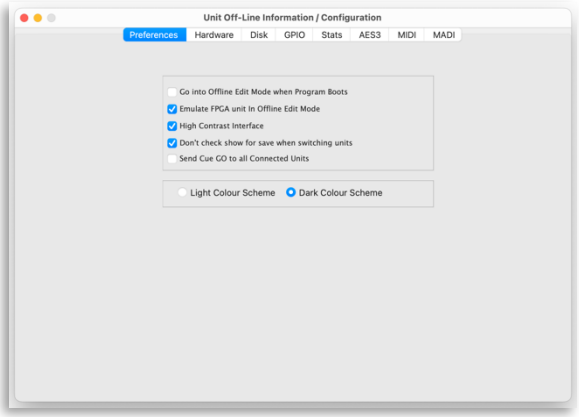
If the software cannot find the TiMax hardware it will show Off-Line in the top-left connection status drop down list in the Main/Mixer Window.

When **checked** the software will mount a virtual TiMax emulator in the PC/Mac, and will load the show that was most recently open in the Off-Line editor.

Before starting programming Show, first Save Show As and name a Show file; you are prompted for where on your computer's disk to save the file. Subsequent saves are to that location. If you open a Show file, subsequent saves are to that file. The save name location can always be changed by using the Save Show As … command. **Regular Saves and backups are recommended practice.**

Emulate FPGA in Offline Edit Mode
When **checked** the software will mount a virtual TiMax emulator in the PC/Mac, and will load the show that was most recently open in the Off-Line editor. **Un-checked** offers legacy support for older DSP based audio processing.

High Contrast Interface
This mode offers better visibility of highlighted items



Don't check show for save when switching units
In multi-frame configurations this option when checked stops the software warning the user to Save the show file on the other units if two or more TiMax frames are used to create a larger system.

Send GO to all Connected Units
Links the Cue List GO Cue command so it is sent to all connected TiMax SounfdHub units the PC/Mac is online to.

Light / Dark Colour scheme
Changes the GUI display to be more suitable for bright/daylight or subdued lighting.

Hardware
For information only, shows internal hardware configuration, **Write To File** provides a .txt file with hardware specs factory record

Disk
For information only, shows the disk information

GPIO
GPIO port is for Service Use Only.

Stats
For information only, TiMax power-users and service techs only. Also tells you its Serial Number and current running temperature.

AES3
AES3 Output sample rate conversion setup, see the AES card configuration section.

MIDI
MIDI preferences setup has moved to the System Preset page

MADI
MADI source selection and setup, see the MADI setup section

Link to: Introduction Training Video

Password Protection
As supplied the TiMax unit and TiMax software do not have password protection enabled.

To set a password to allow the software to log on to TiMax or to allow user access to the front panel controls, select the Set Unit Password from the Unit menu and set a password of between 4 and 8 numbers with value of 1, 2 or 3. i.e., 123123. Please note that you will be prompted to enter a new password twice.

To clear all passwords, select the "Set Unit Password" from the "Unit" menu and put a check in the box as shown

Please note that if you lose or forget your password, there is a master password that will allow access to any TiMax…it is the least memorable number imaginable and so, being instantly forgettable it is written here in almost-invisible ink:

[3,1,2,1,1,2,3,3]

Show files
When the TiMax software is first launched, you will need to create a New Show. When subsequently launched the software automatically retrieves the copy of the Show file from the TiMax disk when it logs on-line to a unit, or if the user preference is to go into Off Line Edit, the software loads the last show file edited off-line.

The loaded Show file name will be displayed at the top of the Cue List and the PanSpace window.

From the **File** menu select **Save As..** to save the current Show file to a new name on the control computer. This will change the Show file name to the new name on the TiMax internal disk

From the **File** menu select **Save** to save the Show file to the control computer using the current show file name.

A Show file consists of the the system, spatialisation and automation information only and does not contain any media such as audio files or PanSpace graphic files.

Show Archive
A Show Archive contains the Show file and any media associated with the Show file, including all **audio clips** and the PanSpace **Venue graphic** (see later). **Always Save As to name and create a Show file first, *then* Make Show Archive to of it afterwards (if required).**

Link to: UI Walkthrough Training Video

TiMax MCP

TiMax2 SoundHub software now connects to an AI assistant on your desktop, significantly reducing the time it takes to set up, so your creativity can begin faster.

An experimental feature, free in software version 6.13 and above software for Mac and PC. For more general information please visit the TiMax MCP webpage.

What it does

TiMax MCP connects TiMax2 SoundHub software to an AI assistant on your own desktop, using the open Model Context Protocol.

- Imports speaker layouts from Martin Audio DISPLAY 3, d&b ArrayCalc and EASE files.
- Creates and edits Speakers and their positions.
- Creates and edits Image Definitions.
- Creates and edits Subspaces.
- Creates and edits Scaling Surfaces.
- Creates and edits Output Labels.
- Reconfigures venue orientation where the prediction file doesn't match the orientation you want in TiMax2 SoundHub software.

Everything it creates appears in the software as normal objects: visible, editable, reversible. Built to the open MCP standard and tested with Claude Desktop.

Setup time, not show time

TiMax MCP is an initial setup design-time tool only. It's not designed for the creative workflow and the MCP feature should be turned off during live performances. Shows should run from SoundHub exactly as they do today, from your own programming.

This setup workflow requires no hardware and can be completed in the software alone.

What it produces is a first pass, visible and editable, that you then refine from there.

Built on real knowledge of TiMax

TiMax has loaded the MCP server with real product knowledge – how the software works, what Image Definitions, Subspaces and Scaling Surfaces are for, the geometry behind reference points – so the assistant works from the detailed knowledge of TiMax2 SoundHub software.

How to set it up

You'll need the latest TiMax2 SoundHub software and an MCP-capable AI assistant on the same machine. TiMax MCP is built to the open MCP standard and tested with Claude Desktop. Free and paid assistant accounts both work.

Cursor, VS Code (GitHub Copilot), Windsurf, and Cline can also connect directly.

At the time of writing, ChatGPT (website or desktop app), Claude used in a web browser, Google Gemini, and Microsoft Copilot cannot be used with the TiMax2 MCP Server. These assistants reach out to MCP servers from their own computers on the internet rather than from yours, so they have no route to TiMax2 running on your machine.

Support for these assistants changes frequently, so this list may go out of date.

Connecting to the TiMax2 MCP Server

The TiMax2 MCP Server lets an AI assistant read and change your showfile. It runs on this computer at http://localhost:7040/mcp while TiMax2 is open and Enable MCP server is ticked.

These instructions cover both Mac and Windows and are all shown within the TiMax2 software as well.

Before you start

- Your AI assistant must be installed on this same computer. It cannot connect from another computer, a tablet, or a phone.
- There is no password, licence key, or account to enter.

Setting up Claude Code

Claude Code connects directly, with nothing extra to install. If you have not used a terminal before, follow these steps exactly.

Step 1 — Make sure TiMax2 is running, with Enable MCP server ticked.

Step 2 — Open the terminal application.

- On Mac: open Finder, click Applications in the sidebar, open the Utilities folder, then double-click Terminal.

- On Windows: press the Windows key, type cmd, then press Enter.

Step 3 — Type the following command, then press Enter.

You can use the Copy Claude Code command button that appears at the top of the TiMax 2 software and paste the code seen in the software as outlined below, rather than typing it by hand.

claude mcp add timax2 --transport http http://localhost:7040/mcp

Step 4 — Check that it worked. Type the following, then press Enter.

claude mcp list

You should see timax2 in the list that appears.

Step 5 — Open Claude Code and ask it: "What can you do with TiMax2?"

It should reply with a list of the things it can change in your show.

To disconnect again later, type the following and press Enter.

claude mcp remove timax2

Setting up Claude Desktop

Claude Desktop cannot open a local address on its own, so it needs a small helper program called supergateway to pass the connection through. The helper requires Node.js to be installed first — download it from https://nodejs.org and run the installer before you start.

Step 1 — Quit Claude Desktop completely.

Step 2 – Open Claude Desktop's configuration file. Claude Desktop can open it for you: go to Claude Desktop's settings and look for the developer options, which include a link to the configuration file. Failing that, search your computer for claude_desktop_config.json.

Step 3 — Put the following into the file.

Use the Copy Claude Desktop configuration button featured at the top of the TiMax2 software, then paste the code shown in the software as outlined below. If the file already has other entries in it, add the TiMax2 section alongside them instead of replacing everything.

```
{
  "mcpServers": {
    "TiMax2": {
      "command": "npx",
      "args": [
        "-y",
        "supergateway",
        "--streamableHttp",
        "http://localhost:7040/mcp"
      ]
    }
  }
}
```

Step 4 — Save the file, make sure TiMax2 is running, then open Claude Desktop.

The first connection needs an internet connection, because the helper program is downloaded the first time it runs. After that it is stored on your computer and works offline.

Other AI assistants

Cursor, VS Code (GitHub Copilot), Windsurf, and Cline can connect directly. In the assistant's MCP settings, add a server using:

- Address: http://localhost:7040/mcp
- Type: Streamable HTTP (some assistants call this simply http)

Older assistants that only support the earlier connection method can use http://localhost:7040/sse instead.

For setup guides covering many other assistants, see https://modelcontextprotocol.io/clients

If it does not work

- The assistant reports it cannot connect, or shows no TiMax2 tools — check that TiMax2 is running, that Enable MCP server is ticked below, and that the assistant is installed on this same computer.
- The terminal says npx is not recognised, or command not found — Node.js is not installed. Download it from https://nodejs.org.

⚠ Important

- This is an experimental feature.
- Turn off the MCP Server during live performances, so an assistant cannot change anything mid-show
- Always back up your show file before letting an assistant make changes. An assistant is able to delete speakers, subspaces, and output labels.

Navigation

Main Toolbar Buttons
The software connection status indicated here can be in one of 3 modes; Offline, Off Line Edit or On Line to a TiMax, when unit serial number or name is displayed.



Click the Network icon to select the computer's network port. The displayed OffLine will change to the unit serial number, or if named, the name appears in the list instead. The drop-down list shows all the TiMax units on the Local Area Network. Switch to a different unit by selecting the unit in the list.



The Link bars show that the software is Online connected to a TiMax and the quality of the connection between computer and unit (actually it is graphically indicating the ping speed).



The Mute All button Toggles between muting and unmuting all Inputs and Outputs.



The Clear Solo button will flash if any Channel or Group Solo is active, clicking the button will clear active solos. Select **additive ("S+")** or **self-cancelling ("S-")** Solo modes as indicated by the Mode button, which toggles between S+ or S-. Solo works like a solo-in-place system, i.e. when a channel is Solo button is active then all other Channels or Groups are muted.



Stop all will stop all Cues panning, showcontrol and Playback when clicked.

Files Window

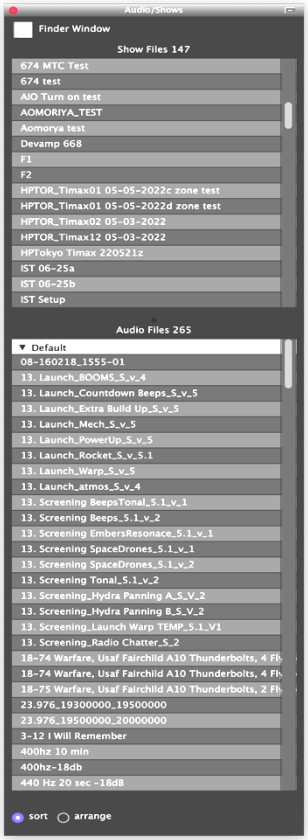
To see the Show files and audio files on the TiMax internal disk, open the Files window by clicking on the Files button.



Left-click to launch Finder/Explorer
Right click to set target folder

Double-click to load a Show File from TiMax internal disk

Click and drag to Playback box above Input channel fader to load clip and audition it



By right clicking on the Explorer / Finder button, the default location for the window to open can be set, i.e. the location of your sound effects library – this can be any drive anywhere on the network.

Audio files can be organised in folders, right click to create a new folder and drag and drop to move audio files from one folder to another.

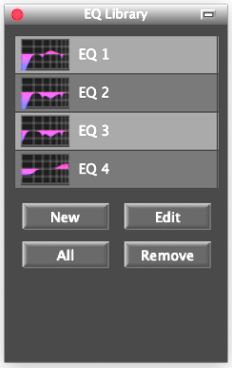
EQ Library

To open the EQ library or bring to the top if hidden, click on the EQ button.

Input and Output EQ settings can be saved to the EQ library. The EQ library is saved as part of the Show File.



To save an EQ curve to the library, set the EQ on an Input or Output channel, close the EQ window and drag the thumbnail curve above the Input or Output fader to the library.



An EQ curve in the library can be applied to an Input or Output by dragging from the library to the EQ thumbnail area above the Input or Output fader.

To name the EQ curve, double-click on the library object or highlight it and press the Edit button, change the name and press OK to close.

EQ curves can also be created from within the library by pressing New.

EQ curves in the library can be edited by highlighting one and pressing Edit.

The All and Remove buttons let you highlight all the EQ curves to Remove, or you can Remove individually highlighted ones.

Image Definition Library

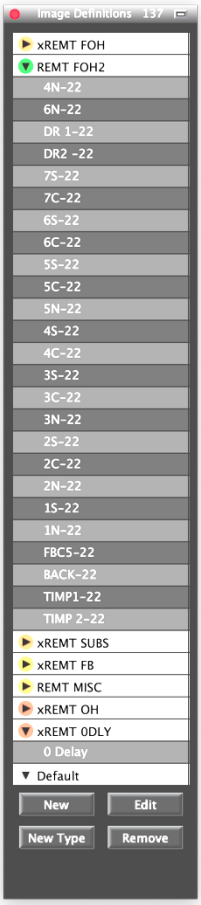
The Image button will open the Image Definition library…, an Image Definition (ImDef for short) is a routing object that contains matrix level and delay parameters to be applied to Inputs in PanSpace (see later).

An ImDef is used in a variety of ways to send audio signals to the Outputs.

They can be applied directly to Inputs in the Mixer page, on the TimeLine or in the object-based Panspace window.



ImDefs can be created and auditioned by setting levels and delays in the matrix with live audio running. Once the levels and delays are all set the routing relationship can be saved to the ImDef library with a right-click in the box below the Input fader and selecting New Image Definition.



ImDefs can be also created and edited from within the library by clicking New and setting the levels and delays without disturbing the live status of the matrix.

ImDefs can also be created with levels and delays auto-calculated in PanSpace (fastest and most common)

ImDefs can be organised into folders that can be expanded and collapsed. To create a folder, click New Type.

Drag and drop to move an ImDef from one folder to another.

Link to: Image Definition Training Video

Cues

To open the Cue List, or if hidden to bring it to the top, click on the Cues button.



The Cue List is one of three places where Cues can be created and manually recalled.

In TiMax a Cue is a general term for an event – it may be any combination of Snapshot, or TimeLine or PanSpace programmed event, or a sequence of events.

Cues panel – From left to right:

- **New Cue** create a new empty Cue in the Cue List
- **Edit Cue** opens the Cue edit dialogue
- **Recall System Preset;** is a special master system Snapshot that separate from the Cue List, – see following section
- **Store System Preset; –** see following section



Cues panel – From top to bottom:

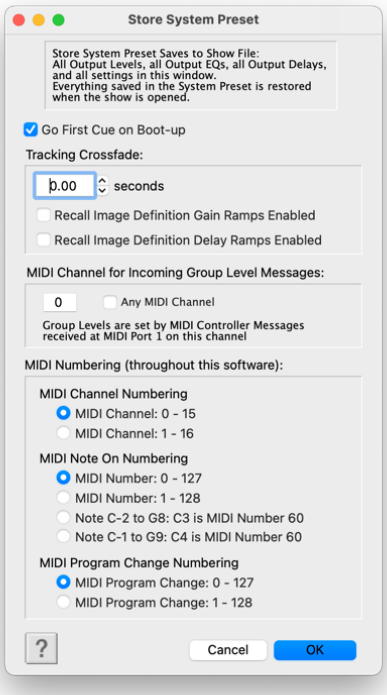
- **Show File** name and internal date/time clock
- **New, Edit, Recall and Store** buttons described above
- Buttons to show or hide various **Clocks**
- The **Cue List**
- **Cue Recall:** Cues may be recalled manually by lining up the target Cue against to **GO button** and clicking on the GO button.

TiMax requires you to create (Save As..) a Show and make at least one New Cue in order to start programming.

Link to: Building a Cue Training Video

System Preset
The System Preset is a special system configuration preset and Output status Snapshot that contains **Output Level, Output Delay** and **Output EQ** data as well as other Show file related configuration parameters.

The System Preset can be updated at any time by clicking the Store System Preset button, so if any changes are made to any of these parameters during the run of a Show, they can be saved independent of Snapshots in the main Cue list.



The system preset is automatically recalled whenever a Show is loaded.

The System Preset can be thought of as similar to a conventional sound system loudspeaker controller or drive-rack settings.

The System Preset's settings can subsequently be overridden live during the Show by Snapshots in Cues if changes to Outputs settings are needed.

The check boxes for options:
- **Recall Image Definition Gain Ramps Enabled**
- **Recall Image Definition Delay Ramps Enabled**

are for **Zoned tracking** with TiMax TrackerD4 as well as continuing "7K" legacy tracking system support. They set how fast the tracking system morphs Image Definition levels and or delays from stage zone to zone. When checked, the Recall Routing Ramp Time boxes allow a user-defined ramp time to be set for morphing of either level, delay or both. A typical setting of 1s to 1.5s is a good start.

The **MIDI Channel for Incoming Group Level Messages** section allows the user to set the channel that the TiMax Group master faders will respond to MIDI controller messages.

The M**IDI Numbering** setup is to allow TiMax MIDI message display format to be matched to external equipment that may be controlling TiMax or being controlled by TiMax. This is often referred to as US or Japanese format. MIDI messages sent and received are not altered by changing this setup, only how they are displayed.

NB The Store System Preset button will flash on/off when any changes are made to Output Level/EQ/Delay Mixer settings contained in the stored System Preset. Recalling the Cue to eliminate the changes, or re-Store-ing the System Preset will stop it flashin

Groups

TiMax has up to 32 DCA groups that can be freely assigned and overlapped as required. Click the Groups button the open the group faders to assign Inputs or Outputs to group faders.

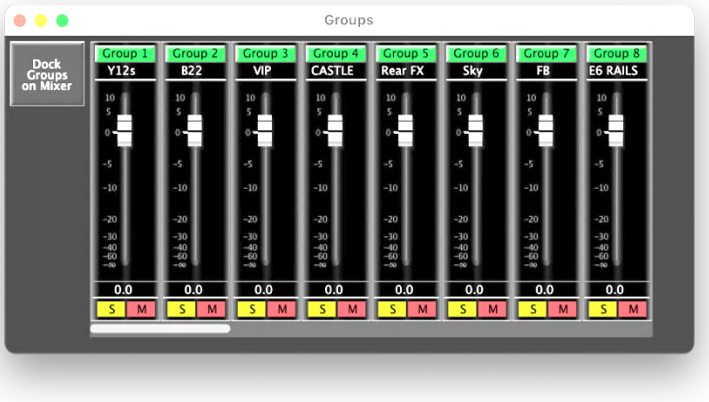


The Group faders can be docked to the Mixer page below the Output faders.

Group faders can be created as masters or submasters to control the gain of all or certain sets of Input and Output channel faders.

Groups contain any selection of Input or Output channels or both.

Group Solos and Mutes are also available. Up to 32 groups can be assigned.



Group levels may be controlled by using MIDI faders attached to MIDI port 1, or from the front panel of the TiMax unit.

A set of channels is assigned to a Group by double-clicking the Group buttons on the desired Input and/or Output channels in the mixer window (the buttons flash on and off), then double clicking the Group button of the desired Group master.

Shift & double click can be used to select a range of Inputs or Outputs. Group assignments can be modified by double-clicking the Group button for the Group (all Group buttons flash on and off), double-clicking the Group buttons for the channels to be added or removed, then double-clicking the Group button for the Group to confirm revised selection and complete the edit.

The Group button for assigned Groups is light green. Clicking on an assigned Group button highlights it (bright green) as well as the Group buttons on all Input and Output channels in that Group in the mixer window

A channel may be assigned to more than one Group. To see what groups a channel is assigned to, click the Group button on the channel.

Groups are named by double-clicking in the label field near the top of the group fader, and typing a name

Group channel assignments and Group names are stored in the Show file.

NB Group levels are NOT stored in the Show File, but are remembered when the unit is switched off and back on again.

TimeLine
Click this button to open or bring to the top the TimeLine programming interface. An S version license is required to open TimeLine while on-line to a TiMax unit.



PanSpace
Click this button to open or bring to the top the PanSpace window. An S-Version license (standard) is required to open PanSpace while On-line to a TiMax unit.



Tracking
This button will enable or disable legacy MIDI controller Tracker interface.



Playback
Click to enable / disable internal Playback



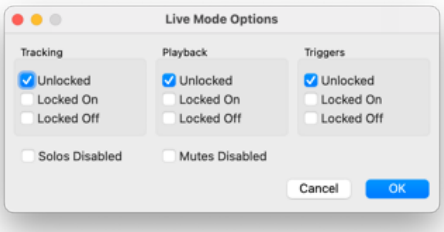
Triggers
Click to enable / disable external triggering of Cues



Live
Click to enable / disable Live mode – Live mode settings can be accessed with a right-click on this button.



Live mode locks on or off Mute and Solo functions and locks Tracking, Playback and Triggers status, to avoid accidents and ensure that the show will run with the intended functions when Live Mode is active.

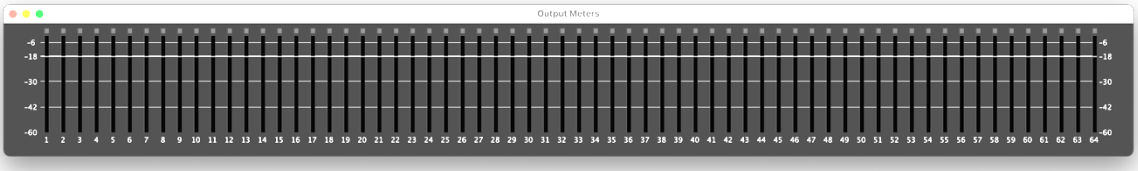


Docking and undocking



This small button in the top corner of the Cue List, Files, EQ and ImDef Libraries offers the options to dock left or right of the Mixer window, or undock to float and arrange these windows anywhere on-screen or, more usually, dual screens. The software defaults to Libraries docked on the Left and Cue List docked on the right.

Output Meters
From the **View** menu select Show Output Meters to get a useful overview of all 64 channel Output level bargraph meters.



Hovering the cursor over a meter will pop up the Output channel name.

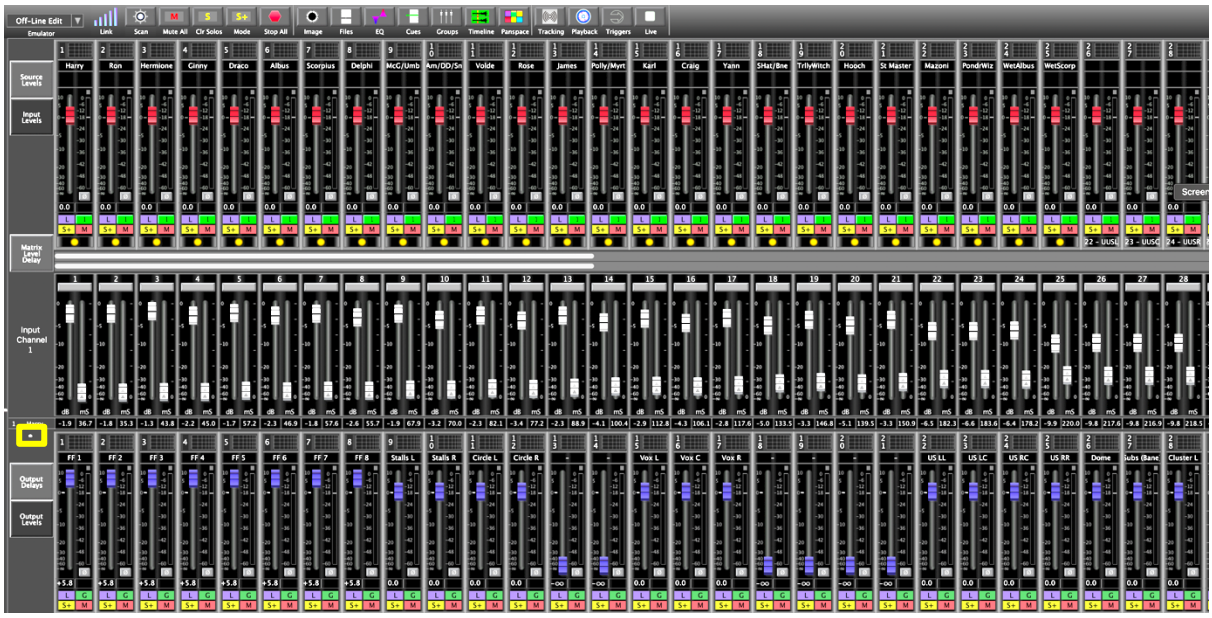
Above each meter is a clip indicator that will show red if an Output has clipped at any time during the current session.

Clip indicators can be reset by clicking on the clip indicator or selecting Clear Clip Indicators from the Mixer menu.

The Mixer

As well as being like the home screen for the TiMax software, the Mixer page is arranged showing signal flow from top to bottom.

The Input channels at the top, Output channels at the bottom, and in between, an assignable collapsible matrix display showing how each Input is routed to the Outputs on a variable and collapsable number of crosspoint rows and faders.



Source Level Input submix (see later) faders can be hidden or displayed by clicking on the Source Levels button.

Crosspoint faders can be hidden or displayed by clicking on the Matrix Level Delay button.

The matrix number display can be expanded to show more channels or contracted with a click and drag down or up on the small white blob (highlighted in yellow).

Clicking on an Input channel strip selects that channel and highlights the corresponding crosspoint row.

Clicking on an Output channel strip selects that channel and highlights the corresponding matrix column.

Output delays can be displayed or hidden by clicking on the Output Delay button.

Link to: The Mixer Training Video

Input and Output control buttons
Control buttons that are common to both Inputs and Outputs



Links channels for temporary ganged control – use shift-click or ctrl click to select ranges of channels. Setting EQ, Level, Solo or Mute on a linked channel also sets all of the channels to which it is linked. Links are set by clicking on the link button in the first channel (which clears all other links), then control-clicking the link button on channels to be added, or shift clicking to add a contiguous range of channels. Input and Output Links are independent and can't be combined.

NB Channel faders with level offsets already applied will jump to the same level if linked then one fader is adjusted. To control several channels while maintaining their level mix, use Groups (below).



Shows **Group** assignment, G is displayed if unassigned or shows group number if part of a Group and the first Group number and + symbol (i.e. 1+) if a member of more than one Group.

A Group may control any combination of Input or Output channels, or both.



Solo, Soloing an Input or Output channel mutes all other Input or Output channels that are not also soloed. Input Solo's will not mute Outputs and Output Solo's will not mute Inputs.

If any channel is Solo is pressed, the toolbar Clr Solo button will flash, clicking on it will clear all solos



Mute. Muting an Input or Output channel stops it passing audio.

Channel Mute status is independent of automation control and is not stored on any Cue Snaphshot.



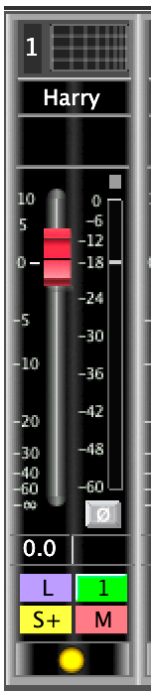
Channel Names Double-click under the channel EQ thumbnail to edit the label text. The channel labels are stored in the Show file. Channel names can be exported and imported in CSV format for quick and convenient spreadsheet manipulation and Show File setup using the File / Export IO labels to CSV file.

NB Channel Names can also be stored and recalled on a per-Cue basis by storing/adding/entering them in a tab in the Cue's Snapshot.

Input Channel controls
Use the upper horizontal scroll bar to view hidden channels.

Description from top to bottom:

Input **EQ** thumbnail – see EQ section for details. An EQ setting can be copied from one channel to another with a click-drag and drop.



Input Channel Label can be set for the Show and per Cue – see the per Cue Input names section for details.

Playback display area shows any active or loaded Playback. For quick and dirty Playback, an audio clip can be dragged here, once loaded right-click for Playback controls.

Input Bargraph metering shows pre-fader PPM response wth a -2dB clip indicator, -18dB nominal operating level. Equivalent to +4dBu analogue Input level.

Polarity button reverses the phase of the Input signal when pressed/ lit. It is not automated or stored in any Cue Snapshot, however the state at power-down is recalled when TiMax next starts up.

Input fader level in dB is displayed under the fader. Double-click in the number box to enter a level value from the keyboard. Shift-click on a fader scale number to quickly jump the fader to that level.

Group attenuation The Group offset in dB is displayed under the bargraph meter. The Group offset is the amount by which the level of the channel is affected by all Groups to which it is assigned.

Link, Group, Solo and Mute. See above for detailed description.

The Input Routing field at the bottom of the channel contains the routing assignment for the Input channel. This can be programmed in the matrix (see below) or using an Image Definition.

An Image Definition routing assignment can be applied to an Input channel by right-clicking on this area and selecting it from the popup menu, or by dragging it from the Image Definition Library.

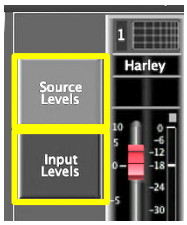
A Image Definition from one Input channel can be dragged and dropped onto another Input channel.

Link to: The Mixer Training Video

Source Submix

Click on the **Source Levels** button top left of the main Fader panel then select different Submix Input sources on the three buttons below the three Submix faders:





I/O card for external Analog or AES

Network for Dante or MADI

Playback for internal Playback track.

Click on the **Input Levels** tab to revert the display to show Input channel faders.



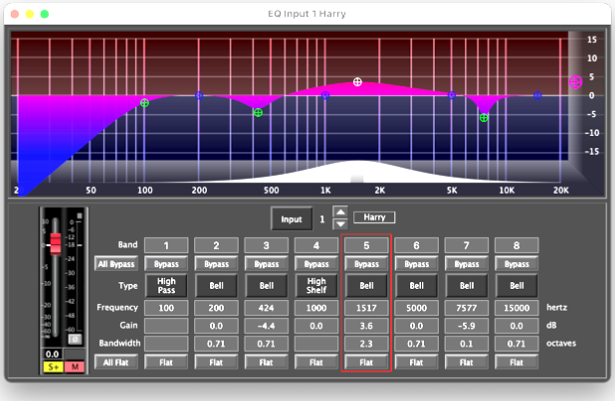
Input Equaliser

Click on the **EQ thumbnail** to open the Input EQ screen for that channel

Each Input has a 8-band parametric equaliser, the filter type of each band can be chosen from a drop down menu and parameters can be entered by dragging nodes to alter Boost/Cut or Frequency and shift + drag to change Width. Parameters can also be entered and edited numerically. Boost/Cut can also be done with a handle on the right-hand-side dB scale, Frequency using a handle on the bottom frequency scale, and Width using the adjacent EQ curve skirts on the frequency scale.

EQ changes made on an Input that is Linked to others are simultaneously applied to the others. If a channel already has some EQ filters used, they can be adjusted when linked, and/or unused filters can be adjusted add to that channels previous EQ setting.

EQ settings can be copied from one channel to others, or to the EQ Library, by dragging and dropping the channel thumbnail image to another channel(s) EQ thumbnail or to the EQ Library.

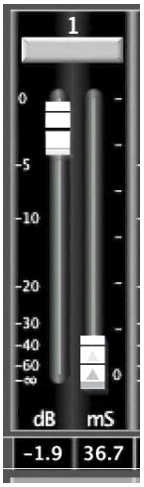


To view other channels there is no need to close the EQ window, either click on the channel to be viewed or enter the channel number in the box or us the up/down spinners.

Any EQ filters adjusted in previously linked or un-linked channels will not be affected if the linking is subsequently changed. This allows EQ offsets to be applied between linked channels.

Matrix

At the heart of TiMax is a Level/Delay matrix which allows the sound reinforcement system to support multiple simultaneous time alignments.



Matrix routing objects (or **Image Definitions**) can be named and saved to the Image Definition Library so routing patches that are frequently used can be easily pasted onto Input channels.

Level/delay settings may be created manually in the matrix and stored as part of Cue Snapshots, or as Image Definitions for quickly repeatable assignments. Image Definition rendering can also be done automatically in the PanSpace (see later).

The **Input Routing** field at the bottom of the channel indicates how the Routing Assignment for the Input channel is set. This can be applied old-school by punching numbers into the matrix, or by applying Image Definitions, or by object-based PanSpace placement (more later).

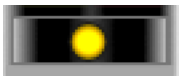
A different icon appears in the Routing box depending on which mode:

 - Checkerboard indicates direct matrix programming, recalled by a Snapshot

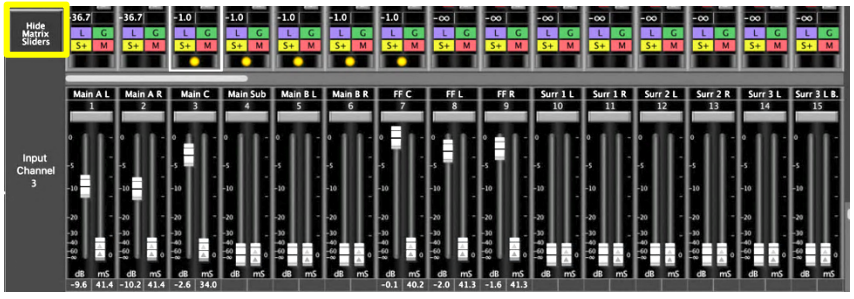


- ImDef name indicates an Imdef dragged from the Library, or recalled by a Snapshot or TimeLine programming.

An Image Definition can be applied to an Input channel by right-clicking in this Routing box and selecting it from the popup menu, or by dragging it from the Image Definition Library. An Image Definition from one Input channel can be dragged and dropped onto other Input channel(s).

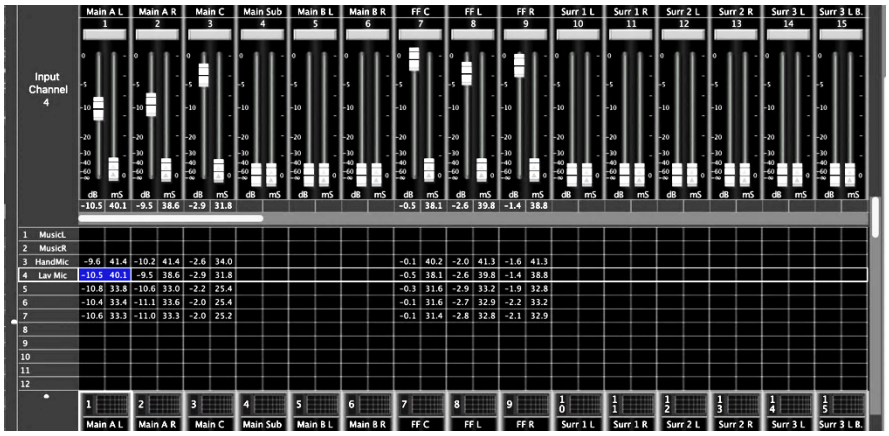
 - Coloured dot indicates placement in the PanSpace as part of its object-based static or dynamic spatialisation.

Matrix-crosspoint level and delay values can be entered via numerical matrix grid or by using a row of the matrix level/delay faders. Input channel numbers are shown down the left hand-side of the matrix.



You can Show/Hide the matrix-row faders between the Inputs and matrix display. The crosspoint faders always act on the highlighted matrix row. Clicking the button again hides the crosspoint faders.

The number of matrix rows visible can be altered by dragging the window open or closed by clicking on the drag handle situated just below the matrix row Input numbers on the left-hand side. The mouse scroll-wheel allows you to see other rows.



The **Matrix level and Delay faders** route the selected Input to the Output directly below the matrix fader. Values may be set numerically in the number box below the fader.

To select an Input, click on an Input channel in the Mixer above, or on the channel name panel to the left of a matrix row. The selected Input and the corresponding matrix row will highlight to indicate it is selected. To select an Output to route it to, click on an Output channel in the Mixer below.

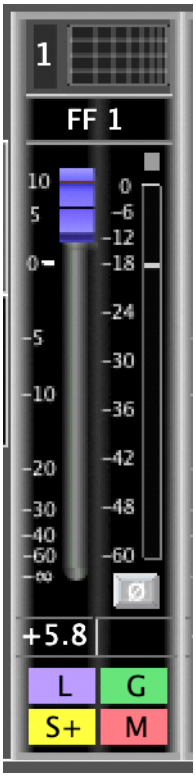
Double-click in the highlighted matrix crosspoint and adjust level and/or delay using the matrix-row faders, or by entering values numerically

A range of matrix Input/Output cells can be selected using shift click and ctrl click and adjusted in one operation.

To view hidden Outputs use the lower horizontal scroll bar, and the right hand scroll bar let's you view and adjust other Inputs

Link to: The Mixer Training Video

Output Channel controls
Use the upper horizontal scroll bar to view view more channels.



Output EQ thumbnail – see **Output Equaliser** below or details.

Output Channel Label can be set for the show by double clicking in this region

Output Bargraph metering shows post fader PPM response wth a -2dB clip indicator, -18dB nominal operating level. Equivalent to +4dBu analogue Output level.

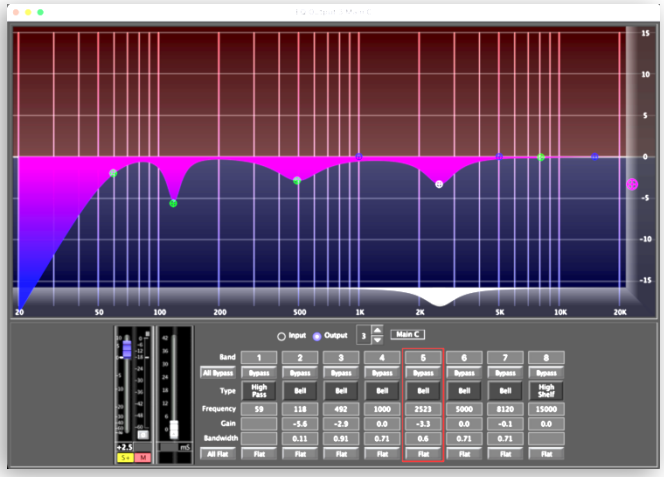
The **Polarity** button reverses the polarity of the Output signal when lit. It is not automated or stored in a Snapshot, however the state at power-down is recalled when TiMax next starts up.

Output Fader level in dB is displayed under the fader. Double click in the number box to enter a level value via the keyboard.

Group attenuation The Group offset in dB is displayed under the bargraph meter. The Group offset is the amount by which the level of the channel is affected by all Groups to which it is assigned.

Link, Group, Solo and Mute – see Page 36 for detailed description.

Output Equaliser
Double-click on the Output EQ thumbnail to open the control window.



The Output equaliser is almost identical to the Input EQ, the window has an additional fader to set Output Delay.

Each Output has a 8-band parametric equaliser, the filter type of each band can be chosen from a drop down menu. Parameters can be entered by dragging nodes to alter Boost/Cut or Frequency.

Parameters can also be entered and edited numerically. Boost/Cut can also be adjusted with a handle on the right-hand-side dB scale, and Frequency using a handle on the lower frequency scale, and Width using the adjacent EQ curve skirts on the frequency scale.

EQ changes made on an Output that is Linked to others are simultaneously applied to the others. If a channel already has some EQ filters used, they can be adjusted when linked, and/or unused filters can be adjusted add to that channel's previous EQ setting.

EQ settings can be copied from one channel to others, or to the EQ Library, by dragging and dropping the channel thumbnail image to another channel(s) EQ thumbnail or to the EQ Library.

To view other channels there is no need to close the EQ window, either click on the channel to be viewed or enter the channel number in the box or us the up/down spinners.

Any EQ filters adjusted in previously linked or un-linked channels will not be affected if the linking is subsequently changed. This allows EQ offsets to be applied between linked channels.

The Cue List

The Cue List is the best place to get an overview and control of the run of a Show. Cues can be created and fired, internal and external triggers can be set, Cue clocks, show clocks and MTC timecode can be viewed.



As detaied above, the Cue List can be docked or undocked from the Mixer page.

The **Cue List** from top to bottom:

The **current Show file** name is displayed at the top of the Cue List.

The **Date and Time** set in the TiMax onboard real time clock are displayed to the right of the show name.

Click the **New Cue** button to open the New Cue dialogue and create a New Cue.

Click the **Edit Cue** button to Edit an existing Cue

To **Store or Recall the System Preset**, click on the relevant button.

Three **TiMax clocks and MTC timecode** Input and Output can be displayed or hidden by clicking on the appropriate button.

The **Cue Clock** starts running after a Cue is triggered. It can be paused and re-started by pressing the the space bar or the Cue play-pause button in the upper left corner of the TimeLine (see later)..

The **Stop** symbol will stop all Cues and audio Playback.

All the Cues in the current show are listed in number sequence. Re-numbering Cues moves them in the Cue List and New Cues can be inserted using decimal-point Cue numbers.

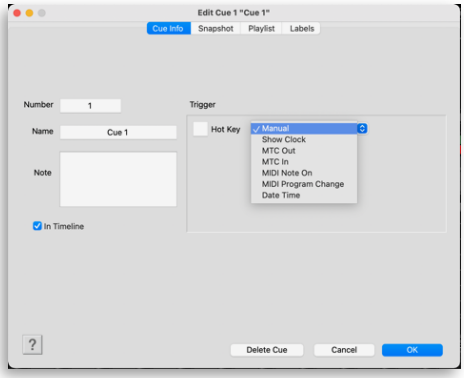
Symbols to the right of each Cue name indicate useful information about each Cue such as if the Cue contains a parameter Snapshot, and any Triggers assigned to the Cue. (More later)

Link to: Building a Cue Training Video

New / Edit Cue dialogue
To create a New Cue, click the New Cue or Edit Cue button to open the Cue dialogue. The Cue dialogue has 4 tabs where Cue parameters and actions can be set.

Creating a New Cue only creates a Cue entry in the Cue List, adding a Snapshot, or Playback or dynamic event sequence requires subsequent programming.

Cue Info
Set the Cue number, name and write notes about the Cue. Determine whether the Cue is shown in the TimeLine be checking or un-checking the check box. (Useful if it's just a Snapshot Cue)



A keyboard Cue trigger Hot Key can be defined, this can be any single keyboard key and is case sensitive.

The Cue Trigger dropdown offers a selection of Input trigger types you can assign to fire the Cue.

MTC Cue Triggers
The MIDI TimeCode receive frame-rate is auto-detected when MTC Input is seen at the Midi 1 in port.

Cues can be triggered from MTC In by setting this as a Cue trigger option in the New Cue or Edit Cue dialogue. Using a simple active SMPTE to MTC convertor allows Cues to triggered from SMPTE LTC timecode at any frame rate including drop-frame. TiMax will recognise and display the frame rate at the top of the Cue List.

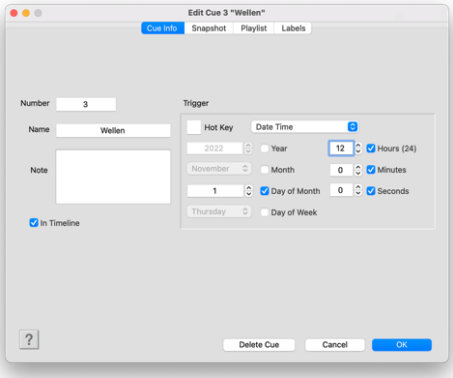
MIDI Note & Prog Cue Triggers
A Cue can be triggered from a MIDI Note or Program Change on MIDI in 1 or 2 ports on the TiMax unit rear panel. In the Edit Cue dialogue box Trigger's pull-down menu select the message type, set the MIDI channel number and value to trigger the Cue. **NB Be sure to check the global MIDI Note and Prog numbering standard in System Preset**

Show Clock Cue Triggers
The Show Clock is created in the TimeLine as an automation event by dragging the Show Clock Start icon onto the TimeLine Event Bar. Once running, Show Clock values can assigned here to trigger subsequent Cues like an internal timecode.

NB The Edit Cue button will flash on/off when any changes are made to mixer settings contained in that Cue's Snapshot. Recalling the Cue to eliminate the changes, or Updating the Snapshot will stop it flashing.

Link to: External ShowControl Training Video

Time of Day Cue Triggers



Presets may be triggered from a specific Time of Day or interval, or a particular Date defined in the Triggers command screen. To use Time of Day triggers it is necessary that the system Date/Time clock is set accurately.

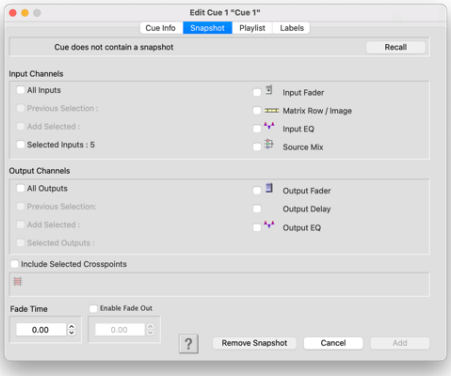
The example illustrated will trigger this Cue at midday on the first day of every month.

Note that the onboard system clock has no knowledge of daylight saving changes to local time, but can be set by the TiMax software

Setting Real Time Clock

Under the **Unit** menu, select the Set Unit Clock option. The unit clock is set to the same value as the computer connected to it.

Cue Snapshot



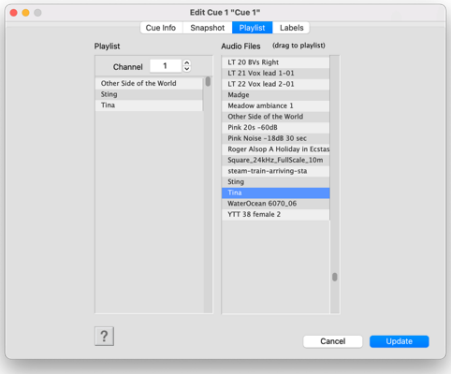
To capture a Snapshot, select the parameters (faders, matrix, EQ etc.) to be captured and the channels to be included in the Snapshot.

Input and Output channel selection can be determined by clicking on channels in the Mixer window. Shift Ctrl / Cmd click do the usual.

The fade time will set fade in and out to the same rate unless the Enable Fade Out box is checked and a different fade time is entered for the fade out.

When a valid selection of options is made, the Add button will become active and when clicked the Snapshot will be added to the Cue.

Cue Playlist



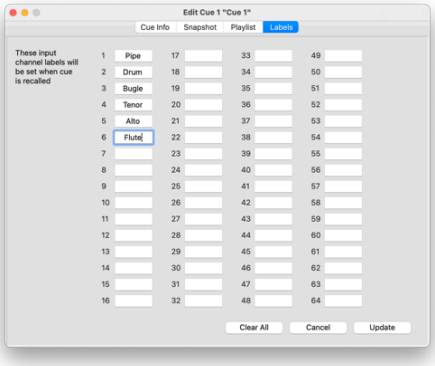
An audio playlist can be added to a Cue, the audio files to be played must first be loaded to the TiMax disk.

Files on the TiMax disk are displayed in the window on the left and can be dragged to the window on the right.

The audio files will play in list order on the designated channel if mono and also on the desgnated channel +1 if stereo.

On-Cue Labels

Input channel names can be set to change when a Cue is fired.



The On-Cue Labels will overwrite Show file channel names when the Cue is executed and will remain on the channel strip until overwritten by an new On-Cue Label.

On-Cue Labels can be exported and imported in CSV file format using the On-Cue export and import commands under the File menu.

Cue names left blank will remain un-changed on those channel strips. Tip: If you want certain channel names to be removed for subsequent Cues, just add a - dash into the box

Link to: Building a Cue Training Video

Image Definitions

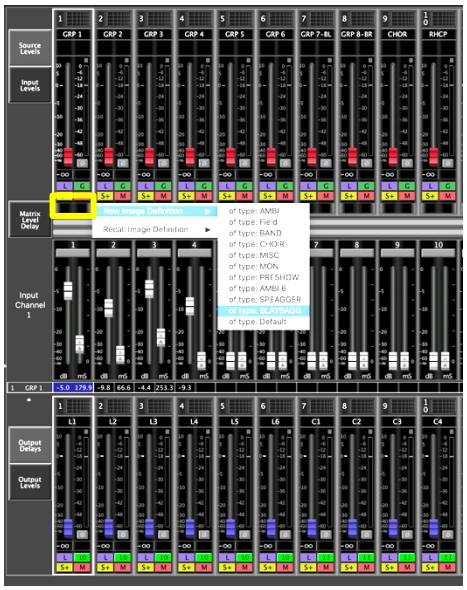
The unique and powerful **Image Definition** is fundamental to understanding how TiMax works. It also also very easy to get your head round.

An Image Definition (ImDef for short) is a level and delay relationship, an imaging / routing object that has been saved as an entry in the ImDef library, which is then used to tell Inputs how to be routed to the the Outputs.

ImDefs can be applied as a static routing dropped onto an Input in the Mixer page, or as a static or dynamic routing object in the TimeLine and PanSpace.

ImDefs can be manually created, or auto-rendered, or imported from another Show File or even a csv spreadsheet. They are user-defined to send Inputs to selected Outputs/speakers at independant level/delay settings to achieve user-defined sets of spatial imaging objectives, eg vocals, band, choir, reverbs, fx etc.

Create / Edit Image Definitions on the Matrix
ImDefs can be created and edited directly on the matrix section of the Mixer. Open the matrix faders, set the desired levels and delays.



To save as a new ImDef, right-click on the routing label box (highlighted) just below the Solo and Mute buttons and choose the option to create a **New Image Definition** as illustrated.

To edit an existing ImDef, right-click on the routing label box and choose the option to recall an Image Definition. Make the desired modification, note that as soon as any change is made the border around the routing label box will flash orange to indicate that a change to a libraried ImDef has been modified.

To save the change, right click on the box and select the option to Update the ImDef.

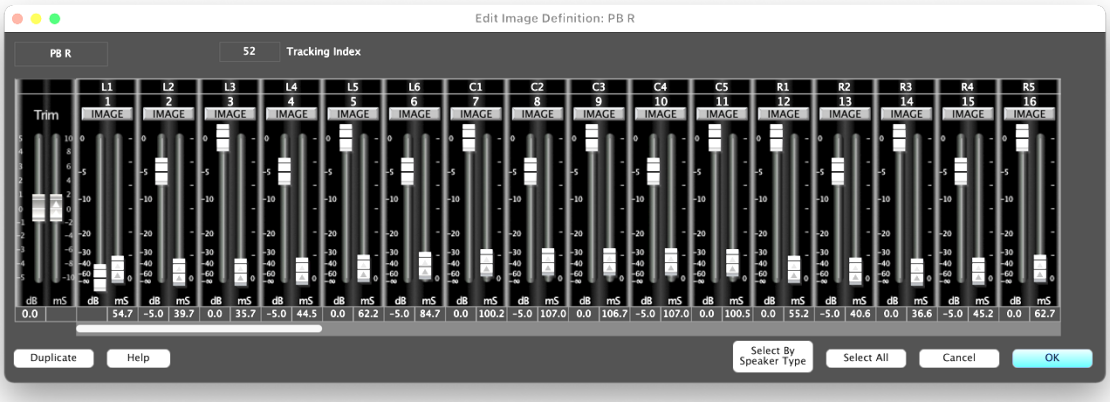
If several ImDefs have been modified, eg a tweak on FrontFill levels across multiple loaded ImDefs, and all the changes need to be saved, then select Update All.

Once an ImDef has been Updated, all channels that have that ImDef applied during the show will be updated with the new version.

Link to: Image Definition Training Video

Create and Edit Image Definitions using the Image Definition Editor

To create a new ImDef from within the ImDef library, open the ImDef library and choose New to create a new Image Definition. Set the level and delay faders and click OK.



To edit an existing ImDef, double-click on the library entry to open the library entry. Make the desired modification and click OK.

Once an ImDef has been Updated, all channels that have that ImDef applied, either in the Mixer, or under automation in rthe PanSpace or TimeLine, will be updated with the new version.

There are some useful features within the ImDef editor that are worth exploring:

- **Duplicate,** makes a copy for you to edit give it a new name
- **Help**, gives some useful tips
- **Select By Speaker Type** will allow you to quickly grab all the speaker sends of a particular Type (see PanSpace) and trim levels and delays with the Trim faders on the left of the Editor
- **Select All**, lets you quickly adjust all ImDef speaker sends simultaneously
- **ImDef Name** can be edited in the top left.

The Image button



You will see a button above each matrix fader which illuminates with the word **Image** when an ImDef is created or edited.



If the button is clicked, the word Image vanishes which indicates that the **associated Output is excluded/isolated from the ImDef**, so when that ImDef is subsequently applied to an Input channel, the matrix setting on that channel will not be effected. Uses for this feature include:

- The ability to set up a mix that is independent of ImDef recall, eg. Show Relay, Foldback, Announcer or DJ Monitor mix.
- The ability to turn up and down selected Outputs without creating multiple versions of the same ImDef with eg. Subs up and Subs down.

A rarely used feature but can really help when you you need it.

S Version features

Introduction
The standard S Version software provides unparalleled flexibility and functionality to the Playback and show control capabilities of the TiMax system.

The S version software must be licensed to the TiMax hardware on which it is run. An S-Key unlock code is generated uniquely for the TiMax unit's serial number. This is entered in the "Set S-Version Key" dialogue accessed from the Unit pull-down menu list. TiMax SoundHub units will normally be shipped with this aready set.

Overview
The S Version software includes the powerful control interfaces of TimeLine and PanSpace.

The **TimeLine** allows scheduling and manipulation of dynamic panning using PanSpace pan nodes or Image Definitions spatial objects directly from the library, volume profile mix automation, sound-file Playback and nondestructive editing and looping of audio files within Cues.

Link to: Timeline Training Video

The **PanSpace** provides an object-based spatial setup and rendering interface in which the spatialisation can be programmed, visualized and controlled. Sound objects can be placed and moved in real time, either by graphical freehand and vector programming or real time location tracking.

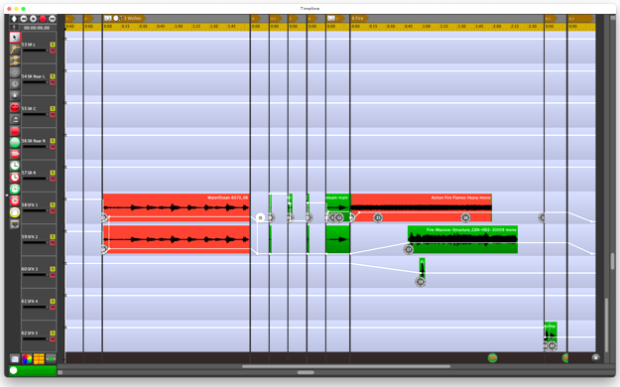
Link to: Building a PanSpace Training Video

The TimeLine

Click this button to open or bring to the top the TimeLine programming interface. An S version license is required to open TimeLine while on-line to a TiMax unit.



The Timeline allows showcontrol events and commands (i.e. volume profile mix automation, start/stop Playback, panning, etc.) to be executed anywhere on a Cue's internal timeline, triggered from Cue List Go button or external triggers-



The TimeLine screen is a graphical editor that lays out the Cues in the show in a horizontal progression. The elements within each Cue on the TimeLine are clearly displayed for easy and accurate manipulation of all of the timings of all of the elements.

The TimeLine is presented a bit like digital audio workstation software, audio track waveforms are displayed with mix volume contour lines, pan objects etc.

The TimeLine also provides an intuitive user interface for editable sound clip, volume and pan timings manipulation. The system is quarter frame accurate in time, one tenth dB accurate in gain (varies over the range) and one tenth millisecond accurate in delay setting.



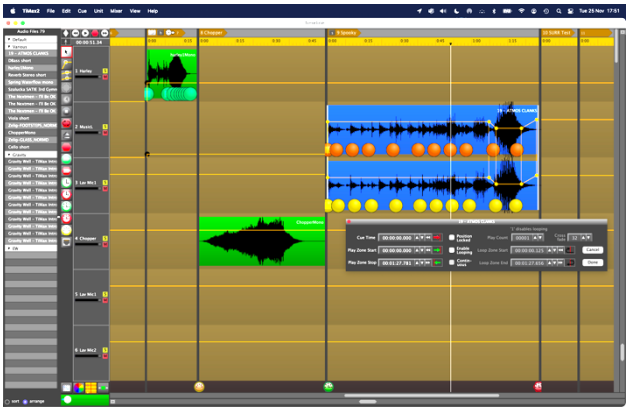
To build a Cue in the Timeline Editor, make an empty New Cue in the Cue list or, right-click anywhere in the grey Cue Flag bar, just above the timeline scale at the top of the Timeline Editor. The usual New Cue dialogue will appear allowing you to number and name the Cue.

The Cue name flag also displays various icons to indicate the presence of a Snapshot within the Cue and any Trigger mode assigned. **(NB OSC Cue Recall Triggers are not displayed here, only in the OSC Window – see later)**

Spatial panning of external or internal audio sources can achieved by placing one or more Image Definitions on a channel in the Cue. They can be dragged from the Image Library or with the ImDef tool selected a double-click on a channel will bring up options to select from the library and place.

When several ImDefs are placed along a TimeLine track, the external source or internal Playback clip is dynamically panned as the Cue playhead passes between the ImDef objects.

However it is more usual to program both static and dynamic pans in the PanSpace, which automatically places PanSpace pan nodes on the TimeLine so you can then adjust pan law and timings.



All Cue edits made in the TimeLine Editor are automatically saved when the cursor is clicked off the edited object or when the Done button is clicked on the popup editor.

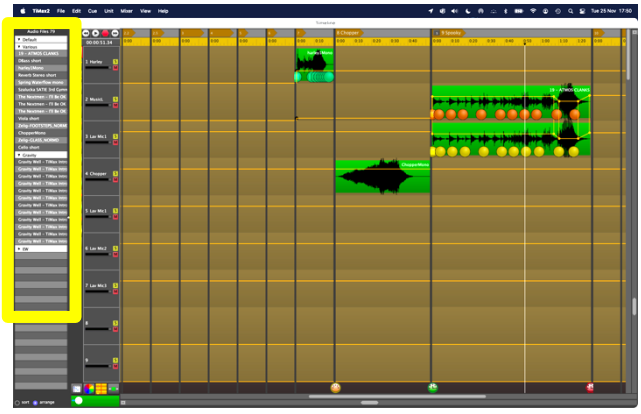
Snapshot and TimeLine event Co-Existence

A Snapshot will set up channel routing, fader level, EQ, or Source Mix at the start of a Cue. After the Cue recalls EG Snapshot initial fader level, any subsequent volume profile mix automation will automatically take over.

NB If a Cue includes TimeLine programmed control of parameters such as pan/routing and level, it is important to ensure that the Snapshot settings and TimeLine events do not try to compete. It's best to decide on a strategy to use one or the other depending on the nature of the show or project.

To edit the Snapshot element of the Cue, run the Cue and either stop it or let it run to the end, or open the Snapshot editor and click the Recall Snapshot button to recall the Snapshot, make the edit and then Update the Snapshot.

Loading Audio Files to the TimeLine



Audio files are loaded into Cues from the TiMax internal disk drive by dragging from the Audio Files panel. The audio clip must first be loaded to the TiMax Files panel by dragging direct from Mac Finder or Windows Explorer windows.

Once loaded, an audio region appears showing the audio clip's waveform. If there is already an audio clip on that channel in the Cue, the new audio clip can be added to the end of the previous clip on the same track and will play after the first clip or, it can be loaded to a different track to play concurrently with the first clip. If you drop a clip onto another track the dropped file will automatically be placed so that it starts exactly where the first one ends.

You can build multi-track music or fx Cues from individual mono, stereo or up-to 8-channel stem clips, by dropping audio files onto multiple tracks in a Cue. Audio regions can be slipped forward and back in time.

When you drag a sound file into the Audio Files window, the file is converted to a the format required for TiMax. This file is sent to the TiMax and a copy is kept in the local TiMax Files Directory on your computer. This directory is located in different places on different operating systems, but can always be found by selecting Open TiMax Files Directory in the Files menu.

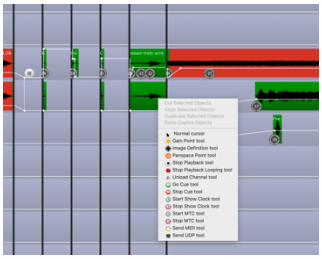
Link to: Timeline Training Video

TimeLine Toolbar

On the left hand side of the TimeLine window are a number of tools and select icons used for creating and editing TimeLine events. Some tools are for placing on the individual tracks, and some are for placng down on the Event Bar below.

The general pick tool will select what ever object is clicked on and if selected and double-clicked on a track will place a mono volume node.

Double-click to place and single-click to select and edit either by using the popup edit tools or drag. A quick hack is to right-click in the TimeLine to bring up the same selection as a popup on your mouse cursor.



Lasso-select to copy and paste single and multiple objects.



General control tool

Mono volume node – place and select on channel only

Stereo volume node – place and select on channel only

Image Definition – place and select on channel only

PanSpace object – select on channel (this one's placed by the PanSpace)

Stop Playback place – place and select on channel or Event Bar

Stop loop – place and select on channel only

Unload audio – place and select on channel only

Stop all – place and select on Event Bar only

Go Cue – place and select on Event Bar only

Stop Cue – place and select on Event Bar only

Start Show Clock – place and select on Event Bar only

Stop Show Clock – place and select on Event Bar only

Start MTC clock – place and select on Event Bar only

Stop MTC clock – place and select on Event Bar only

MIDI event – place and select on Event Bar only

UDP event – place and select on Event Bar only

Transport controls

The TimeLine transport controls are in the top left of the TimeLine page.



Top row from left to right

 **Go back** to where play was last started

 **Go back to start** of the current Cue, or if already there, go back to the start of the prior Cue

 **Start Cue** from the current playhead position

 **Stop**

 **Go To** the beginning of the next Cue.

Bottom row:

 **Cue clock count** up / down select



Cue clock

TimeLine display controls

The TimeLine display controls are located in the bottom left corner of the TimeLine window.



 **Open Audio Files** list to allow clips to be dragged to Cues

 Set **TimeLine colours**

 Set **scroll options**; don't scroll, paged scroll, background scroll

 Show **full Show thumbnail**, zooms out to allow quick navigation to any clip in any Cue. Hover over Cue/track to see name, click to zoom in

 **Magnifies** all the audio clips in the show enabling detail in low level audio files to be seen.

Popup tools

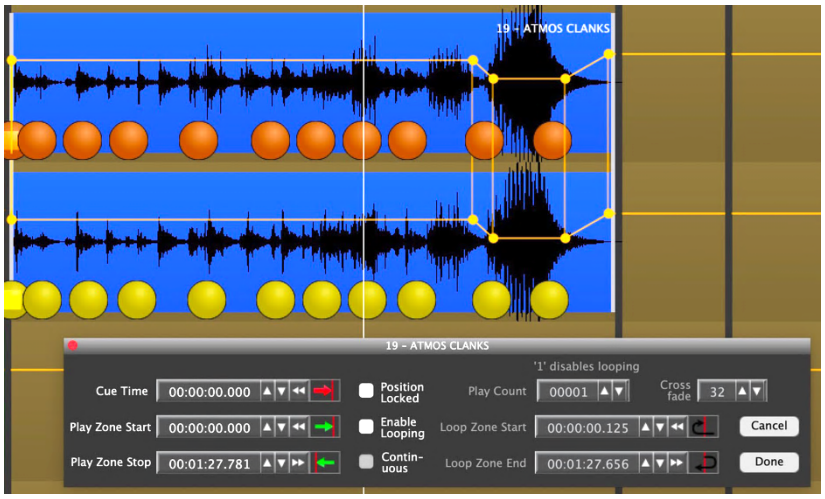
The Cue time edit tools appear when any track or automation item is selected on the TimeLine, EG Volume Node on a track or EG Go Cue tool on the Event Bar. Highlighted Node or Event times can be nudged up or down or set to the start of the Cue,



The red arrow will snap the event to the current playhead cursor position.

Audio File Edit and Looping

Edit the Start and End points of an audio clip by clicking on the audio region to select it, then clicking the bar at the beginning or end of the audio region and dragging right or left.



Looping

Looping on individual waveform tracks can be activated by clicking on the audio clip and checking the Enable Looping box in the Play/Loop edit panel that appears. Loop Start and End points which can be edited numerically or graphically as well as the number of loops and crossfade time. Loops can be set to run a defined number of times or indefinitely until a Cue with a Loop End command is triggered.

Volume profile mix automation and ImDefs or PanSpace panning associated with looped audio are not repeated when the audio loops, as these are functions of the showcontrol engine. If this is required, leave Looping off, trim the audio play zone to the desired length, put the gain and pan elements in that you want, then shift-click to select the audio clip, gain and pan elements, copy and then paste them as many times as needed. Or set a Go Cue trigger for the Cue to re-trigger itself.

Volume Profiling Mix Automation

Volume profile nodes can be added by double clicking on a track, to adjust the Node click on it and drag up or down or side to side. A group of nodes can be selected by dragging a box around them.

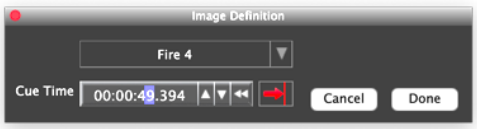


The Volume profile lines illustrated in the TimeLine are followed when Cues are run sequentially, that is to say, when a Cue is triggered the level on a channel will transition where it currently is (i.e. set in the prior Cue) to the level set by the first gain point in the subsequent Cue.

This means that if a fade-in is required on a track in a Cue, be sure to place a volume node on that track at the start of the Cue and a second node at the desired faded in level at the point in Cue time that the fade in should be completed.

Panning with Image Definitions

A fundamental concept in the TiMax system is the Image definition which can the thought of as a routing or spatial pan object.



These Image Definitions are stored in the Image Library and then can be placed (using a drag and drop) into a Cue on the TimeLine. When the Cue is triggered, the gains and delays of all of the image definitions in the Cue are interpolated from one to the next, generating smooth diffusions between ImDefs.

Image Definitions can be moved in time on a track by dragging the ImDef marker left or right in the TimeLine. Multiple Image Definitions can be selected and moved or copied as a group. An Image Definition can be deleted by selecting it and pressing the Delete key.

When there is more than one image definition on a track in a Cue on the TimeLine, the gain and delay values crossfade automatically between values in the image definition as the Cue runs, e.g., to create a level/delay pan movement. This automatic crossfading between ImDefs is a truly powerful feature of the software.

A period of holding an image position is accomplished by repeating an Image definition. The system will in fact crossfade as usual between the two Image Definitions, but because the two are identical there is no actual change to the level / delay of any of the crosspoints and therfore no consequent pan movement.

An instantaneous crossfade happens when two different image definitions are placed very close together. The shortest gain and delay change is 32 milliseconds.

Dynamic Pans
When the Cue is triggered, the level delay of the first Image Definition on a track is applied to the audio. The level/delay pan settings then begin to interpolate from the first to the second Image Definition as the cursor moves towards it. This continues for other Image Definitions placed on the waveform until the cursor passes the last Image Definition. The audio then stays panned to the last Image Definition until the end of the Cue.

Changing Pan Law and Timing
The timing of the pan between pairs of Image Definitions can be adjusted by dragging them closer together or further apart on the TimeLine. Their position can also be nudged by numerical entry in the floating dialogue boxes which appear when you select an Image Definition. Sequences of Image Definitions can also be copy/pasted on the same track to repeat pans, or to separate tracks to apply similar pans to other auduo channels.

NB It is usual and more flexible generally to program dynamic pans in PanSpace which then creates Pan Nodes on the TimeLine which can be copy/pasted and manipulated exactly as above to adjust pan laws and timings (see PanSpace below).

Select an audio clip and associated automation

To select all together an audio file and related gain points, Image Definitions, PanSpace Nodes and other elements that are within the audio region, hold down the shift key when clicking on the audio region. These can then be all moved together or copy/pasted onto other TimeLine tracks.

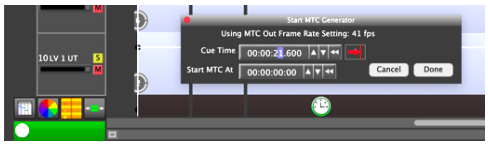
Audio files can be moved along the TimeLine by dragging them with the mouse or by setting the time using the time control in the editor. If the audio file is locked (Position Locked checkbox is checked), the audio cannot be moved.

To move an audio file to a different track, cut it and then paste it to the new track. Individual or groups of Image Definition or PanSpace Node objects can be highlighted using the mouse then copy/pasted onto the same track or different track(s). While highlighted, the group can be squeezed or stretched using the handle on the highlighting outline, to decrease or increase the speed of a simple or complex pan event.

Mono and Stereo and Multichannel audio

An audio file can be mono, stereo or multichannel (up to 8-channel), when loaded to a Cue it will occupy as many TiMax Inputs/Tracks in TimeLine as channels in the audio file. Image Definitions or PanSpace Nodes loaded onto a track will only affect that channel of external or internal Playback audio.

MTC Generator Start & Stop



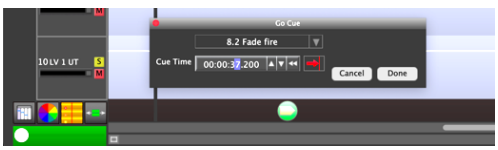
The TiMax MIDI TimeCode generator can be started and subsequently stopped as a TimeLine event by dragging the MTC Start icon from the tool bar onto the TimeLine. Clicking on the start icon allows the start time to be set.

The MTC frame rate is set by opening the MTC clock display and right clicking on the frame rate number box.

Cues can be triggered from MTC out by setting this as a Cue trigger option in the New Cue or Update Cue dialogue.

Time Linked Cues with the Go Cue command

A Go Cue follow-on command can be assigned to trigger a subsequent Cue while a current Cue is playing. Drop Go Cue icon from the TimeLine toolbar to the Event Bar at the bottom of the Timeline.



Single-click on the Go Cue icon to open a dialogue box to enter the Cue you wish to be triggered by this Go Cue. The timing of the Go Cue can be adjusted by dragging it along the TimeLine or entering a number in the dialogue box. The Go Cue selector pull-down defaults to the next Cue but can go to any.

When the main Playhead passes over the Go Cue marker the Playhead jumps to the next Cue and starts playing it. A single Cue can include and activate multiple Go Cue events to trigger multiple Cues.

A sequence of Cues an be set to run automatically by placing Go Cue markers at the end of each Cue to trigger the next in sequence. To make an entire Cue sequence or Show repeat itself automatically, put a Go Cue at the end of the last Cue in the sequence to trigger the first Cue in the sequence.

To terminate a sequence, create a Cue with a Stop Cue command on the Event Bar, and it's also worth putting a Stop Playback and Unload Audio icon on any tracks that may be still running audio.

A Cue can be set to retrigger itself by directing the Go Cue command to the same Cue. This self triggering Cue can be stopped by programing a Cue to with a Stop Cue command drirected to stop the repeating Cue.

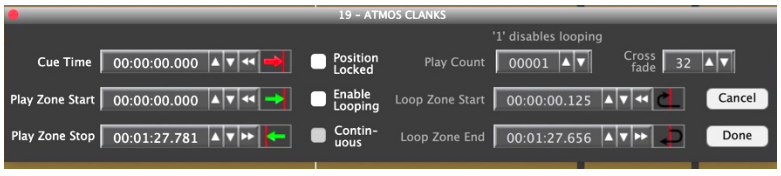
It is worth noting that Go Cue triggers can go backwards as well as forwards up / down the Cue List

There is also a very useful Stop Show and Playback that can be used to stop multiple self-repeating Cues, panning, mix automation and Playback.

Link to: Internal ShowControl Training Video

Auditioning

A Cue can be auditioned from any point in the Cue by clicking in the Cue TimeLine time bar to drop the Playhead. Press the space bar or click > and audio will start and the pan will locate correctly as determined by ImDefs or PanSpace objects.



When a sequence of offfset audio files is placed on different tracks into a Cue, TiMax is will play these files back at the specified Cue times offset from the time the Cue is triggered. If another Cue is triggered in the meantime, inherent overlapping Cue behaviour allows complex soundscapes to be created where different elements of the soundscape are triggered randomly, eg to synchronise with action on stage.

Click on the audio clip to open the audio clip editor pop-up box. Clips can be offset from the front of the Cue, non-destructively edited by adjusting Play Zone Start/Stop, and set to Loop either a set amount of times or continuously. A Stop Loop tool can be placed on a track in a later Cue to stop looping.

The PanSpace

Click this button to open or bring to the top the PanSpace programming interface. An S version license is required to open PanSpace while on-line to a TiMax unit.



General
In the object-based PanSpace environment, a venue drawing can be loaded and scaled, loudspeakers and Image Definitions can be placed in a virtual auditorium or experience space, levels and delays to speakers can be calculated and Inputs can be placed, panned and tracked.

The workflow is intuitive, fast and flexible. The level- and delay-matrix processing between Inputs and Outputs is managed in an object-based manner by the Image Definitions, completely transparent to the operator / programmer, however due to the unparalleled visibility and agency provided by the TiMax workflow, spatial parameters can be viewed and edited to a unlimited degree, to fine-tune the imaging or to meet special spatialisation challenges.

The TiMax exclusive real-time delay interpolation algorithm allows delay-matrix processing from Inputs to Outputs to be morphed in real-time without audible artifacts, thanks to highly sophisticated proprietary TiMax holistic FPGA processing.

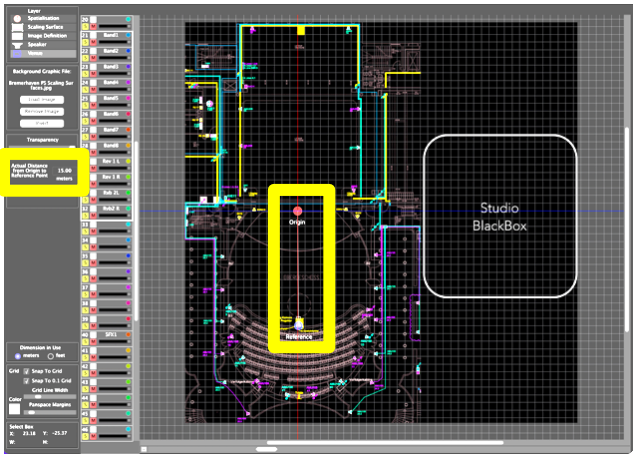
Link to: Building a PanSpace Training Video

Link to: PanSpace Spatialisation Training Video

Venue layer

The first stage in setting up PanSpace is to import and scale a drawing of your venue. The image contrast can inverted between white and black backgrounds, and the transparency can be varied for best visibility. Experiment with the Invert and Transparency controls to get the best visbility of the detail needed.

To scale the drawing, click on and drag the circle labelled Origin and arrow labelled Reference, to places on the drawing that can be accurately measured, either off the drawing or with a laser measuring device.



Best practice is to set the origin and reference point as far apart as practical to minimise scale errors.

Enter the distance between the Origin and Reference points in the box in the panel on the left.

Coordinates can be switched between metric and imperial.

When using a live performer stagetracking system, make sure that the Origin point is at the same location as the 0,0,0, xyz datum reference point for the tracking. This ensures that source object levels and delays match their varying stage positions so concequently get localised accurately by TiMax.

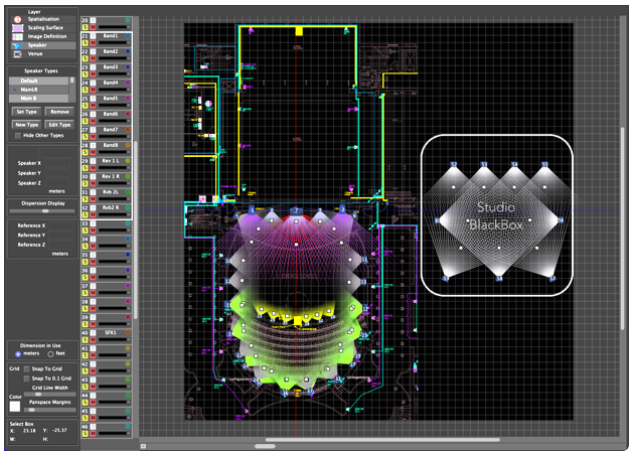
if the Origin is moved in the Venue screen after Speakers and ImDefs are placed then the speakers and ImDefs will move relative to the drawing by the same amount.

The Grid Snap settings are do not have any function in the Venue layer, but are helpful in the Speakwer and Image Definition layers to quickly get an even placement of multiple Image Defintions, to a resolution of either 1m or 0.1m.

In the bottom left corner of the page the Select Box is useful as a means to measure distances off the scaled drawing.

Speaker layer
Speakers are placed in the scaled virtual Venue space by double-clicking on the drawing and selecting a speaker from the drop down list of available Outputs.

The x,y,z dimensions for the speaker positons and the x,y,z positions for the speaker target or reference point (represented by the small square box) are displayed on the left panel.



The speaker reference point would usually be chosen to be the closest seat on axis for near fills or the centre of the coverage area for flown and/or longer throw speakers.

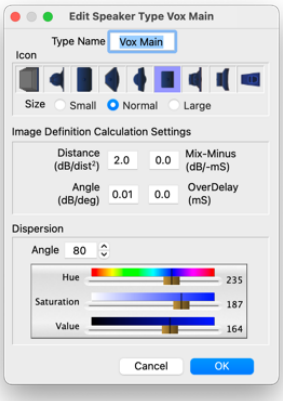
Loudspeakers can be grouped together by functional Types so they can be easily selected for use for different Image Defintion spatial objectives. To create a new Type, click the New Type button. To set or change a speaker Type, hightlight a slection of speakers and click the Set Type button. Remove and Edit will delete or edit (see below) a speaker Type.

The Grid Snap settings can be set to assist placing Speaker, either at 1m intervals or a more granular 0.1m resolution.

New / Edit Speaker parameter
When creating a new speaker type or when double-clicking on a speaker type in the Types list, a parameter edit box will pop up.

Edit functions are, from top to bottom:

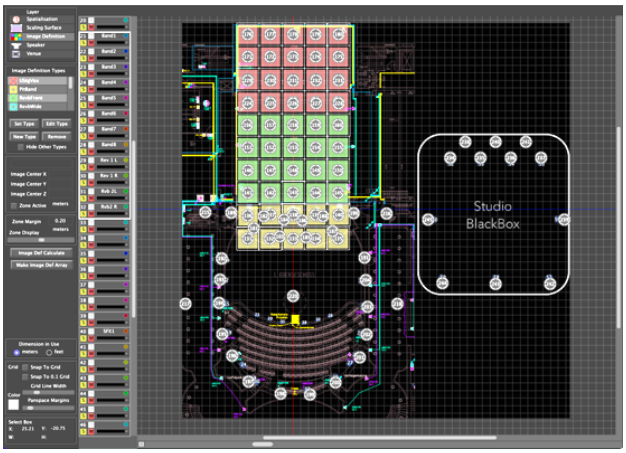
- **Name** the speaker Type, usually defining a functional group of loudspeakers, e.g. Front Fill, Vocal Main or Surrounds
- **Icon and Size** for the speaker Type
- **Adaptive parameters** to set for level and delay calculation when calculating ImDefs (see next section)
- **Dispersion width** for visualisation of coverage. (This does **not** affect any calculations).
- **Colour** of the dispersion display.



Link to: Building a PanSpace Training Video

Image Definition layer

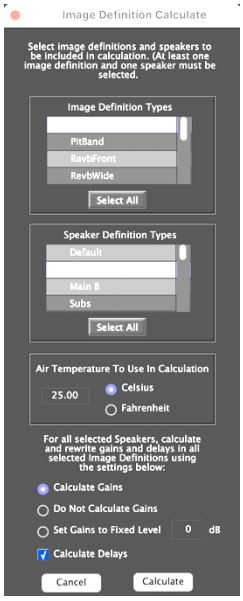
ImDefs are placed in the scaled virtual Venue space by double-clicking on the drawing, selecting New or choosing from the available existing ImDefs Types in already programmed in the ImDef library.



ImDefs can be grouped together in Types defined by different spatial objectives EG, Vocals, Band, Surround, Reverbs etc. To create a new Type, click the New Type button. To set or change an ImDef type, highlight a selction of ImDefs and click the Set Type button. Remove and Edit will remove and edit.

Once placed, levels and delays for each ImDef or ImDef type can be auto-calculated based on it positon relative to the selected speaker or speaker types and thir associated lucky seats.

To calculate ImDef levels and delays, click on the **Image Def Calculate** button over on the left.



The panel to the left of the venue window will change offering selection of the the ImDefs to be calculated and speaker Types to be included. Select an ImDef, then you could choose to include all speaker Types and instantly calculate all parameters. However it is usual to do it by speaker Type one at a time, so you can hit Edit for a highlighted speaker Type and adjust adaptive parameters to tactically influence level-shading. (see below)

Once the Speakers and ImDefs have been chosen, and any desired adaptive parameters have been adjusted, click the Calculate button to instantly create all Image Definitions in the selected Type.

At the bottom of this panel are checkboxes to choose options for calculation, such as to calculate (a) **both levels and delays** as default, or (b) **just levels** or (c) **just delays**. These are helpful for iterative re-calculations of ImDefs to try EG different level-shading but not affect delays that are already working fine) or to set levels/gains to a **fixed level** EG useful for putting a fixed sub-bass feed into Band or Surround ImDefs.

Link to: Image Definition Training Video

Image Definition Calculation

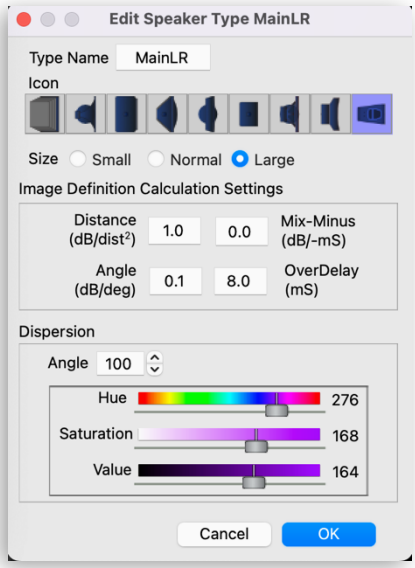
There are 4 parameters that will affect the Image Definition calculation, three of which will alter the level calculated for each ImDef and one that will effect the delay.

The **dB/Distance** parameter is usually utilised for loudspeakers that work in a more long-throw relationship between stage and audience, i.e. pointing outwards from stage and covering large audience areas, eg Main Prosc systems.

The **dB/Angle** parameter is best for EG front-fills working in the nearfield, where more variable attenuation helps support vocal localisation for distant cross-stage ImDefs, and EG for calculating immersive surround ImDefs where more significant amounts of level-shading are needed to support the TiMax delay-panning.

It is quite common to use a combination of **dB/Distance** and **dB/Angle,** for example on front-fills.

They work as follows:



Distance: compensates for inverse-square law, attenuating the level of speakers in furthest Imdef Types based on the square of the distance from the ImDef to speaker reference point.

Angle: creates progressive level-shading based on how far off-axis a speaker is from the ImDef as viewed from the speaker reference point (lucky seat). With the setting as shown at 0.2, the angular attenuation will be -6dB if the speaker is 30deg off axis from the target Imdef.

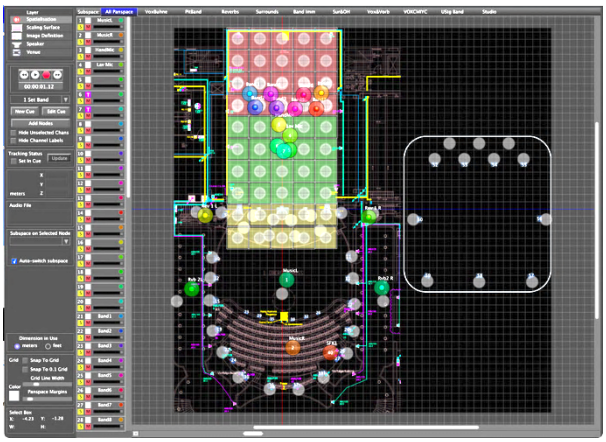
Mix-Minus: for situations where ImDefs are required to be in front of some loudspeakers, or downfills are so high up that they would theoretically require a negative delay. If this is set to 1 it will attenuate the speaker 1dB for every "theoretical 1mS of" negative delay. It can also be used to turn certain speaker Types down to prevent feedback when the performer steps in front of them.

Overdelay: this applies the essential 8-10ms extra delay to the distance-correction delay calculated for that speaker Type, to make the fundamental Haas Precedence imaging work. For main and underbalcony or delay speakers, and also creates a more intimate soundfield for surrounds, free of speaker hotspots and holes between them.

NB For best results it is important that the speaker system has been EQ'd and levelled to get best localisation and imaging results from these Image Definition calculations.

Spatialisation layer

Input objects can have static positions or pan movement trajectories programmed for each Cue.



Working with Subspaces

PanSpace can be organised into Subspaces, each assigned with a specific selection of Image Definition Types (see below), so that different sets of Input objects can be dropped into relevant Subspaces to render different spatialisation objectives without unwanted interactions with other ImDefs.

EG, Vocal on-stage localisation imaging can be kept out of SurroundFX ImDefs, Band imaging can be kept in the orchestra pit and not fed into Surround ImDefs – unless specifically desired and "told to" by putting them into EG a Band Immersive Subspace that deliberately includes both Band and Surround ImDefs.

Subspaces setup

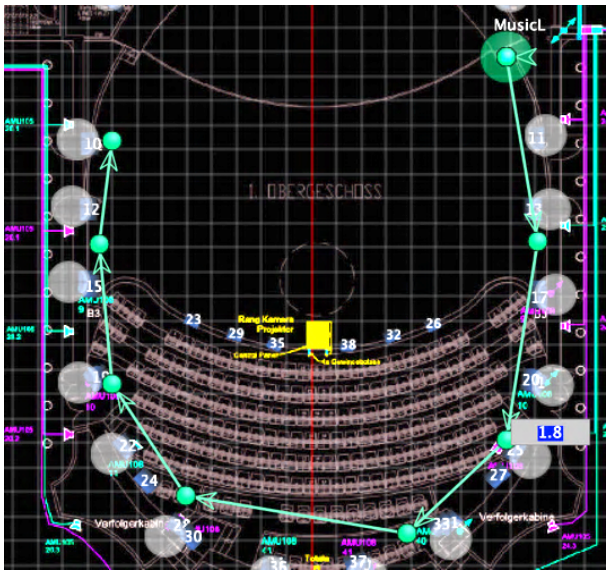
To create a Subspace, right-click on the bar just above the main Spatialisation window and an Edit / Create dialogue will appear in the left pane.

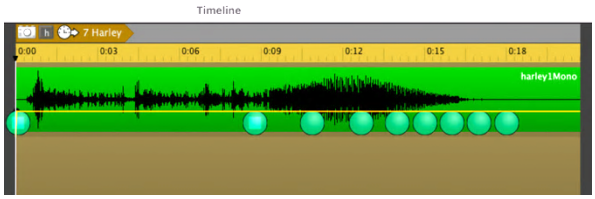
The Subspace can be named and specific ImDefs selected to for inclusion in the Subspace. To subsequently edit a Subspace, right click on its tab.

Inputs can be added to or moved between Subspaces by right-clicking on the Input meter/name box panel on the left of the PanSpace. Select from the pull-down menu of available SubSpaces. **NB you need to be in All PanSpace, or the Input object's existing SubSpace, in order for this right-click pull-down to appear.**

Programming pan Cues

To program a Cue, first create a New Cue or recall an empty Cue as from the current Cue List dropdown. Select an Input from the list on the left and double-click in the spatialisation window to drop a node or series of nodes to create a trajectory. Part or whole trajectories, or individual pan nodes, can be re-positioned in the PanSpace to change the panning.





All **Pan Nodes** automatically appear on the **TimeLine** where you can adjust pan law, and timings by squeezing together and stretching apart the Pan Nodes, copy/paste on the same track or different TimeLine tracks.

Static pan nodes will appear at the front of a TimeLine track, and are perfectly viable and visually intutitive way to apply static routings/spatialisations, especially you are working in a predominantly PanSpace-heavt spatial mixing workflow.

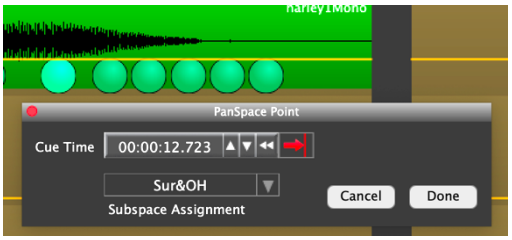


You can also re-time individual pan node segments by clicking on the little arrow on the PanSpace pan trajectory.

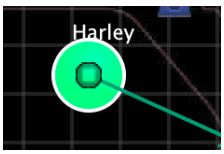
So, to summarise the powerful Subspace feature: When Input pan nodes or trajectories are placed in All PanSpace, when the node moves around the Spatialisation window, the Input will sonically interpolate between **all** of the ImDefs that have been created and placed in PanSpace.

If an Input node is placed into a SubSpace, it will only interpolate between the ImDefs included in that Subspace. This results in versatile selective control of the precision of different spatial objectives, delivering greater immersive accuracy across the broadest range of spatial mix sources and objectives.

And for added versatility, any Input object's SubSpace assignment can be re-assigned on a Cue by Cue basis, allowing infinitely variable spatialisations. In PanSpace, select the Cue, right-click on the Input on the left panel of channel names and meters, and select a different SubSpace from the pull-down.



A pan node with a SubSpace assignment has a square within the circle of the node. Nodes without a subspace assignment do not have the small square.



Pan trajectories can be programmed to move from one subspace to another by setting a Subspace instruction on a node within a trajectory. To do this select a node in the TimeLine and use the **Subspace on Selected Node** dropdown to define this transition.

Nodes highlighted in PanSpace will be automatically highlighted in the TimeLine, to assist you in adjusting pan law / timings and SubSpace transitions as per above.

Link to: PanSpace Spatialisation Training Video

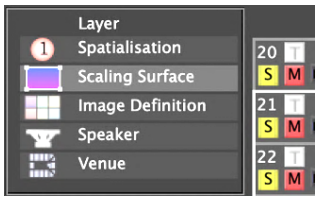
Setting Tracking Status in a Cue

When PanSpace Input object's spatialisation is driven by TiMax TrackerD4, or another performer stagetracking system, or other external OSC showcontrol such as from Touch OSC, TiMax panLab, Grapes3D or Atlas, the button next to each Input in the list on the left will toggle OSC tracking **on (blue**) and **off (grey)** for each Input. Tracking status can be enabled or disabled per-Cue by ticking or un-ticking the **Set in Cue** check-box then **Update**.

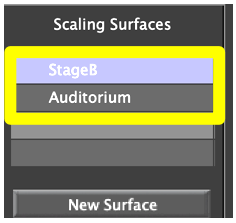
The tracking status will then remain active until is deactivated in a later Cue by toggling the T button off and confirming in the Set in Cue check box. If the tracking status is altered within a Cue in which it is set, the change can be saved to the Cue using the **Update** button.

Scaling Surfaces

You can re-scale the Input source object spatialisation for an entire show to match a new venue by creating a Scaling Surface within PanSpace and modifying its size, shape and height.



To access Scaling Surfaces, select the Scaling Surfaces button top-left in the PanSpace window, select the New Surface button in the panel below, give it a name, then use the grab-handles to adjust the highlight box that appears on the PanSpace, to fit the area for that Surface to cover.



PanSpace can accommodate more than one Scaling Surface – for example to cover "stage" and "auditorium" areas, where the two Scaling Surfaces may be needed to be resized separately. Different sets of Input source objects can be placed in the different Surfaces and be scaled accordingly, EG Vocal and Band, or FX and Reverbs

Configuring and programming Scaling Surfaces is best explained by looking at a hypothetical example (see next page)

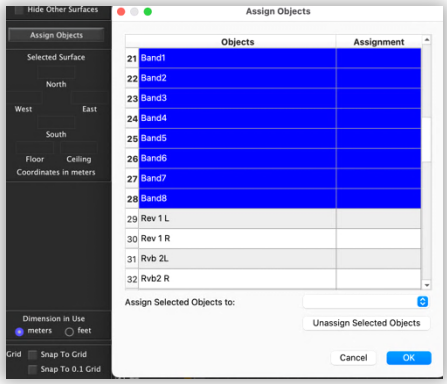
Link to: Scaling Surfaces Training Video

Example – Transfer a main Proscenium theatre show to a Studio BlackBox theatre:

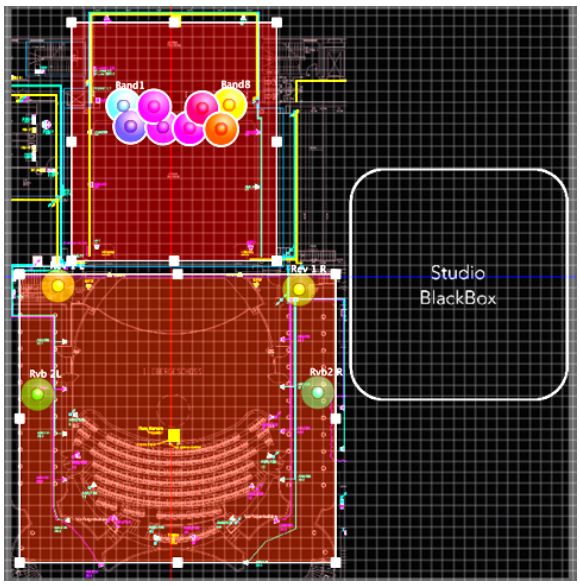
Create a Surface for the Stage and one for the Auditorium, as per above. Resize and/or re-shape the Surfaces using the six grab-handles on each Surface's highlight box

Assign Input Objects to Scaling Surfaces

You can Assign different sets of Input source objects to include in each Surface and be re-scaled with it, eg Band for the Stage and Reverbs for the Auditorium.



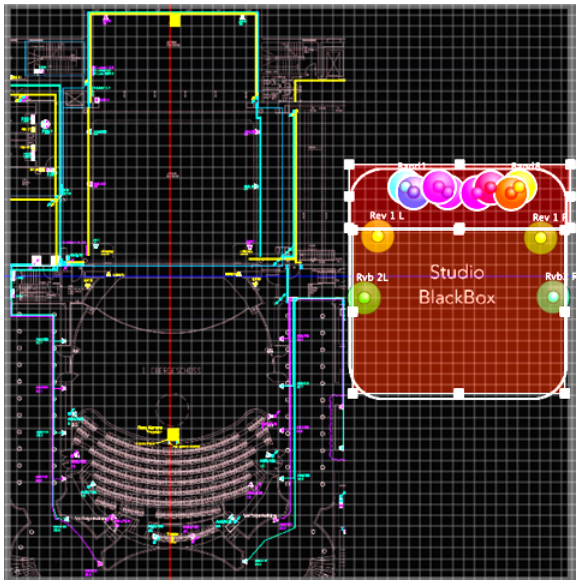
Hit the Assign Objects button on the left-hand side toolbar, select Input source objects in the box, eg. Band1-8, then select a Surface eg Stage from the pull-down menu and hit OK.



Then repeat for other Scaling Surface eg the two stereo Reverb returns, and assign into the Auditorium Surface

Re-Scale the Surfaces

Drag the Band and Auditorium Surfaces over onto the Studio BlackBox theatre, then resize and re-shape the Surfaces to their relevant Stage and Auditorium areas using the six grab-handles on each Surface's highlight box

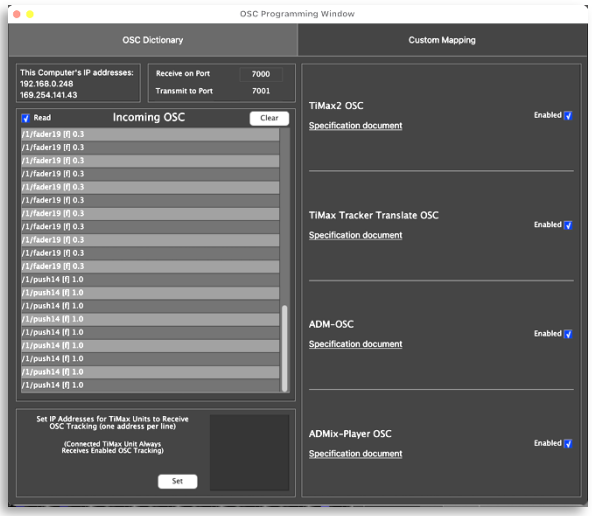


Any selected Surface can also be re-sized and/or re-shaped by entering numbers into the North/South/West/East number boxes on the left-hand side toolbar.

This is also where you will enter the top (Ceiling) and bottom (Floor) for both the original and scaled Scaling Surface, as PanSpace works in 3D and height dimensions are also fully scaleable.

OSC Control

OSC Connection and Formats

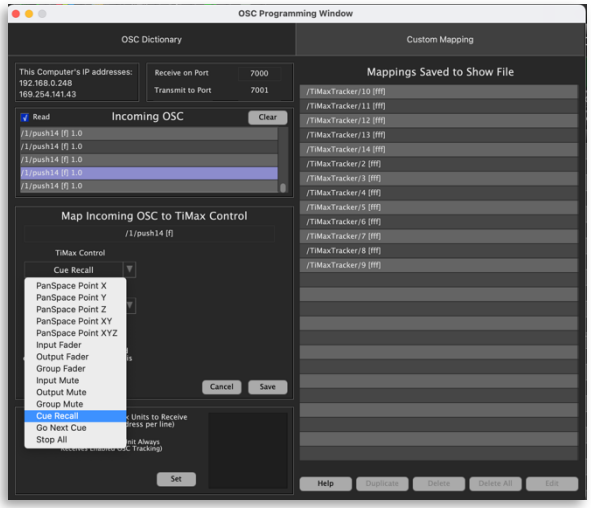


To control TiMax by OSC, the external OSC controller must be mapped **to the TiMax PC/Mac** computer's IP address and (default) port 7000.

Mapping OSC to TiMax functions

TiMax can be controlled by OSC in several different formats, including dedicated **ADM-OSC** and **ADMix-Player** pre-defined messages, and also bespoke Custom format mappings.

From the TiMax View menu, select **Show OSC Window.** Connect the external OSC controller, send the OSC message(s) and they will be displayed in the Incoming OSC window when the Read checkbox is checked.



TiMax2 OSC – Select the **Custom Mapping** tab, Click on an Incoming OSC message to highlight it, then select the desired TiMax function and value from the pull-downs below (eg channel or Group Fader/Mute or Cue number). Hit Save and the mapping will show up in the Mappings Saved to Show file window on the right hand side of the OSC window. **NB: Cue Triggers from QLab need a space and integer, eg 1, after the string**

Tracking in PanSpace – Absolute coordinates

PanSpace control from a tracking system could be either 2d or 3d depending on the tracking system's Output in absolute dimensions relative to an origin. In Options, select Absolute Co-ordinates in meters or feet. The TiMax PanSpace 0,0,0 origin must be the same as that used by the tracking system.

Tracking in PanSpace – Normalised coordinates

Most tablet OSC controllers will Output normalised 2d coordinates, usually from 0,0 for the bottom left corner, to 1,1 for the top right corner. Enter 0 and 1 as OSC Max and Min values, then in PanSpace draw a highlight box to define the tracked area, then hit Set in the OSC window. Also check the **Tracking Enable (Blue T) button on the PanSpace** Input channel to enable the OSC panning.

TiMax OSC Type Dictionaries

Other OSC formats can be directly-mapped in terms of function and channel/parameter value and range by applying standardised OSC formats using the **OSC Dictionary** tab. Each is explained and detailed in the **Specification document** link under each OSC type title in the OSC Programming Window. They are also shown here below for reference.

TiMax2 OSC Dictionary

TiMax2 OSC Dictionary

Version 1.0

The TiMax2 OSC Dictionary allows users to control a set of parameters within the TiMax2 software application. Users can read and write parameters using the command set detailed below.

Communication can be established with the TiMax2 software application via the UDP transport layer, using the OSC protocol. Details of the IP address and ports required can be found within the OSC Programming Window. To navigate to the OSC Programming Window, select the View menu and choose 'Show OSC Window'.

OSC messages can be constructed by combining the Identifier, Module, Name and Input elements together to form an OSC address. Where no argument is provided, the OSC Message is treated as a Read command. If an argument is provided in the correct format, the message is treated as a Write command. For example, to read the current location for Object 1 send:

/TiMax2/position/absolute_meters_xyz/1

TiMax2 will reply with the message:

/TiMax2/position/absolute_meters_xyz/1 [x, y, z]

To write the current location for Object 1 send:

/TiMax2/position/absolute_meters_xyz/1 [10.0, -3.0, 0.0]

This will set the coordinates for Object 1 to x = -10.0, y = -3.0, z = 0.0

Tracker Translate OSC Dictionary

TiMax Tracker Translate OSC Dictionary

TiMax2 supports the TiMax Tracker Translate OSC standard, allowing for a seamless connection between TiMax TrackerD4 systems and TiMax SoundHub.

Communication can be established with the TiMax2 software application via the UDP transport layer, using the OSC protocol. Details of the IP address and port required can be found within the OSC Programming Window. To navigate to the OSC Programming Window, select the View menu and choose 'Show OSC Window'.

OSC messages can be constructed by combining the Identifier and Tag elements together to form an OSC address. The Tag value is mapped to the corresponding object number.

Note: Setting object positions requires that global tracking be enabled, as well as tracking for any object you would like to move.

Identifier	Tag	Value	Read/Write	Type	Description
/TiMaxTracker	/(1-64)	f,f,f	w	float	Absolute object position, relative to the PanSpace origin, measured in meters. X,Y,Z coordinates

ADM-OSC Dictionary

ADM-OSC Dictionary

Version 1.0

TiMax2 supports the ADM-OSC standard, allowing users to control object parameters such as position, level and label using ADM-OSC. Users can read and write parameters using the command set detailed below.

Communication can be established with the TiMax2 software application via the UDP transport layer, using the OSC protocol. Details of the IP address and ports required can be found within the OSC Programming Window. To navigate to the OSC Programming Window, select the View menu and choose 'Show OSC Window'.

OSC messages can be constructed by combining the Identifier, Module, Input and Name elements together to form an OSC address. Where no argument is provided, the OSC Message is treated as a Read command. If an argument is provided in the correct format, the message is treated as a Write command. For example, to read the current location for Object 1 send:

/adm/obj/1/xyz

TiMax2 will reply with the message:

/adm/obj/1/xyz [x, y, z]

To write the current location for Object 1 send:

/adm/obj/1/xyz [10.0, -3.0, 0.0]

This will set the coordinates for Object 1 to x = -10.0, y = -3.0, z = 0.0

ADMix-Player OSC

ADMix-Player OSC Dictionary

TiMax2 supports the ADMix-Player OSC protocol, allowing users to playback ADM-WAV files in ADMix-Player and easily translate movement automation to SoundHub objects.

Communication can be established with the TiMax2 software application via the UDP transport layer, using the OSC protocol. Details of the IP address and ports required can be found within the OSC Programming Window. To navigate to the OSC Programming Window, select the View menu and choose 'Show OSC Window'.

Note: Setting object positions requires that global tracking be enabled, as well as tracking for any object you would like to move.

Module	Input	Name	Value	Read/Write	Type	Min	Max	Description
/track	/(1-64)	x	f	w	float	-1.0	1.0	Normalised object position, relative to the Scaling Surface. X coordinate
/track	/(1-64)	y	f	w	float	-1.0	1.0	Normalised object position, relative to the Scaling Surface. Y coordinate
/track	/(1-64)	z	f	w	float	-1.0	1.0	Normalised object position, relative to the Scaling Surface. Z coordinate

It's about Time …

An introduction to Source Oriented Reinforcement
Put simply, Source Oriented Reinforcement (SOR) is the technique of amplifying sound while preserving the natural acoustic image (position on stage) of the acoustic source.

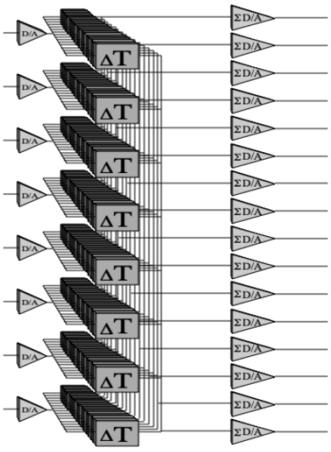
The technique relies on using a psychoacoustic phenomenon called **Haas Precedence Effect** to trick the ear into not hearing the loudspeakers and therefore achieve transparent amplification.

This requires strategic control of level and time delay to each loudspeaker to manipulate the direction of sound for multiple sources over a large listening area.

The result greatly improves coherence between amplified signals and the original acoustic source, as well as preserving directional Cues so the listeners ears guide their eyes, so audiences don't have to play audio detective, they hear the actors and not the amplification

Additional benefits of using these techniques are spatial un-masking and improved intelligibility – in a theatrical or dramatic environment this is important to maintain the audiences willing state of suspension of disbelief.

Or to put it another way, Hear The Sound Not The System.



At the heart of a Source Oriented Reinforcement system is a Delay Matrix.

Each Input can have a unique level and delay to each Output

In TiMax, Levels and delays can be dynamically varied without zipper noise or frequency modulation (doppler effects), to allow sources (ie radio mics) to move round the stage, and/or effects to pan round the room.

TiMax systems also include processing for Input and Output equalisation, Snapshot and dynamic automation, random access multitrack Playback.

As well as authentic imaging for natural sources, these techniques are equally effective at achieving excellent immersive surround audio outcomes by eliminating focus from loudspeakers and creatinga mre intimate soundfield for all listeners.

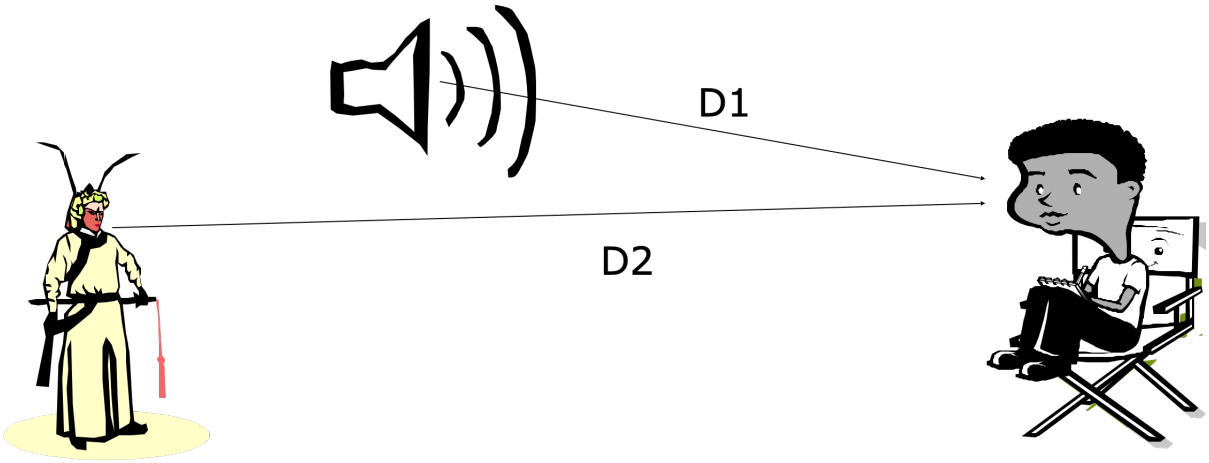
Image Definitions – what are they and how are they set up
TiMax does this with **Image Definitions**, which are level and delay relationships that are stored in a library in TiMax software. Essentially a "spatial routing" library.

Typically an Image Definition sets the necessary levels and delays to the speakers to deliver an Input signal with accurate localisation heard by the entire audience.

However, an Image Definition can be much more than that. It can be a mute state, it can be a distant echo effect it can be a routing to a single loudspeaker, or to all the loudspeakers, or anything in between.

For accurate localisation and best intelligibility, the sketch below shows how the delay from the microphone on an actor can be calculated to compensate for the difference in distance between the actor and a loudspeaker covering an audience area.

In practice it is essential to slightly overdelay the loudspeaker so that the first wavefront, or Precedent wavefront, comes from the voice of the actor or singer, or an acoustic instrument. This is particulary important to achieve a natural un-amplified result for spoken word and musical theatre.



Distance Actor to Listener – D1

Distance from Loudspeaker to Listener – D2

Velocity of Sound – V (approximately 340m/S)

Delay = (D2-D1)/V to match distances

Luckily you can pretty much ignore this albeit relatively simple bit of arithmetic, as it essentially comes down to about **one-millisecond-per-foot** or **three-milliseconds-per-metre**. Give or take a bit for variations in air temperature.

The Image Definition Calculate function in TiMax takes care of this without you having to do the measurements or maths, it even takes the elevations of the speaker and Image Definition into account. And air temperature.

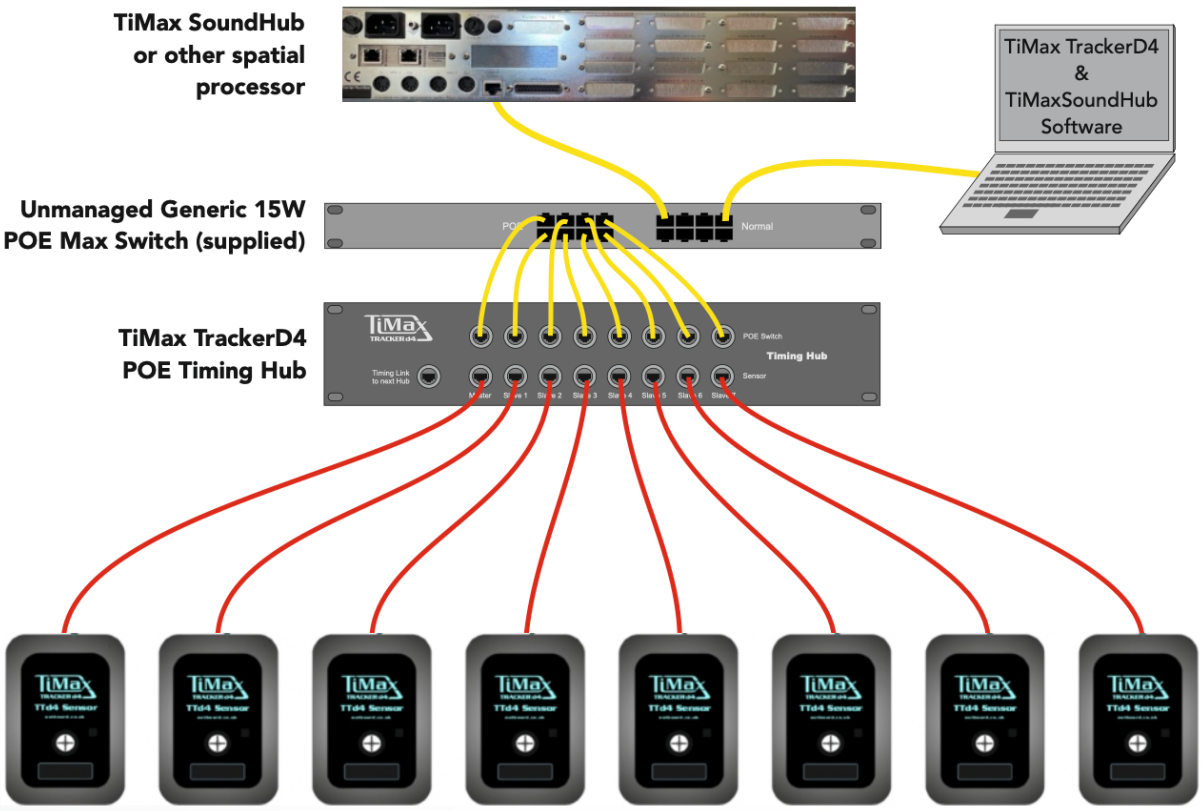
Using performer stagetracking

To give the actors freedom to move around the stage while keeping the sound system localised to them in real-time and hence maintain audience engagement, these days they can be followed by a performer stagetracking system.

The TiMax TrackerD4 is a digital RF system designed exactly for that purpose. The actors carry a small transmitter Tag on their person which bleeps out a very low power high frequency location pulse. A set of antenna Sensors positioned around the stage and auditorium pick up the signal and the software triangulates the positions of the actors.

An Open Sound Control (OSC) data stream is generated from the TiMax TrackerD4 software which is in turn fed to the TiMax PC or Mac software, either on the same computer or a separate one..

TiMax SoundHub seamlessly manipulates levels and delays from the actors microphone Input to the loudspeaker system to deliver accurate directional amplification.



TiMax SoundHub can also be controlled by **ZacTrack** and any other stagetracking system outputting OSC xyz data, as well as **BlackTrax** via the TiMax Tracker Translate app, which converts **BlackTrax RTTrPM** protocol to OSC.

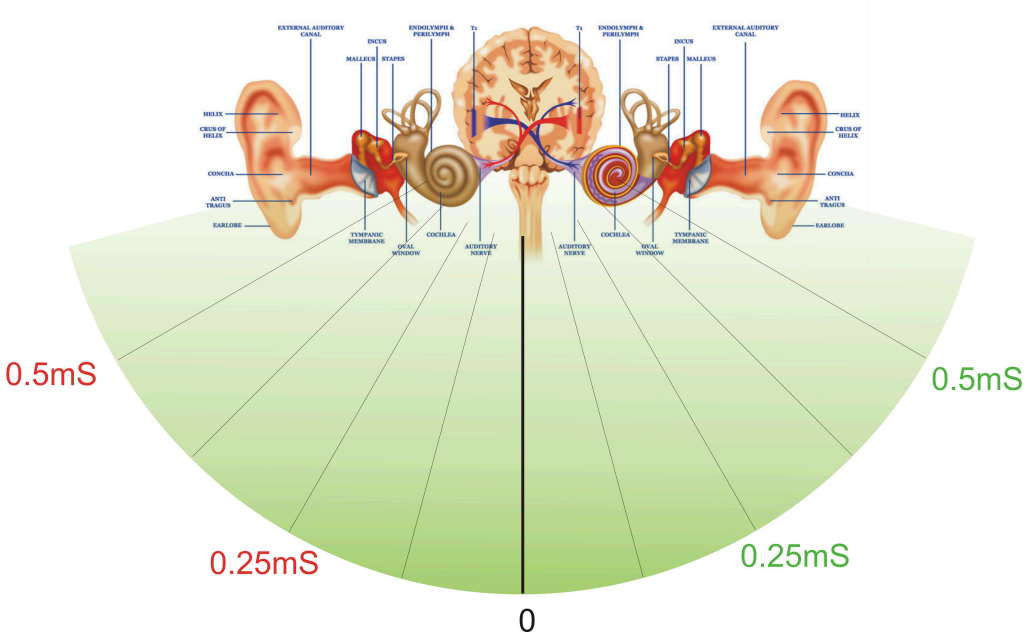
Principles and practice

In SOR implementation here are a number of common themes that are worthy of discussion; firstly and most importantly these techniques are focused on achieving the most natural sounding “un-amplified” results in situations where amplification is necessary due to the scale or environment of the production.

This is best achieved by using a distributed loudspeaker system with loudspeakers located and targeted at the audience such that there is minimum angular difference between that being amplified and the speaker amplifying it. In other words it is more difficult maintain localisation and amplify an acoustic source in front of the listener using a loudspeaker off to one side or behind.

Humans hear binaurally. We hear sounds via two separate aural receptors (ears) and draw conclusions about the positions of the sources of the sound.

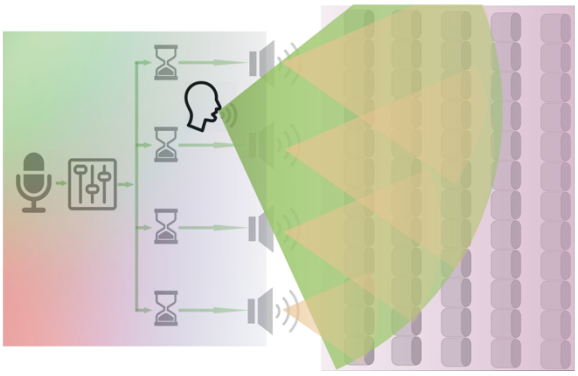
The main clues to localisation of sound are provided by differences in sound levels and arrival times between our ears. These differences allow people to "focus" their hearing onto what is of interest to them and to filter out what is not (this has been aptly named the Cocktail-Party Effect).



Delivering sound in an auditorium from a stereo loudspeaker system conventionally prevents the audience in most listening positions (i.e. anywhere off-centre) from accurately localising anything other than extreme panoramic information in the sound mix. This is because the sound from the closer loudspeaker will arrive at a listener's ears before the sound from the more distant loudspeaker.

This is why the snare or vocals often seem to be coming from just one side of the PA in a larger venues, ie the left or right channel you happen to be sitting closer to, even by just a few feet/meters/ (which is 90%+ of the audience..)

The psychoacoustic law of Precedence, sometimes known as "Haas-effect" dictates that for a sound coming from two or more loudspeakers the listener will perceive the sound as coming from the closer loudspeaker due to its earlier arrival time even if the more distant sound is louder. Thus audience's perception of stereo panning will only be as good as their proximity to the center line of the room.



The way to deal with this is to implement a Source-Oriented Reinforcement ("SOR") system, which, as well as achieving a more even distribution of sound level over a large listening area, will also maintain directional information from multiple sound sources, so that the "audio position" of a presenter, an actor, a musical instrument, recorded program or sound effect authentically matches the actual, or intended visual position.

The outcome reduces listener stress, improves intelligibility and, with the attendent spatial unmasking, dramatically increases engagement and message impact for all audience members. A well implemented SOR system widens the 'sweet spot' for creative panoramic or spatial information in the sound mix to over 90 per cent of the audience listening positions.

Such a system absolutely depends on special type of multi-channel audio matrix such as TiMax to enable the possibility for every audio Input to have it's own unique level and time delay relationship to each loudspeaker. This allows every sound source to be independently localised for every audience member. This is very different to the spatial outcomes that rely just on multichannel level-panning, as they will inevitably be fighting natural Haas Effect Precedence, often in several dimensions. **Haas Precedence has got be controlled, or it will control you.**

SOR techniques have been around for a long time and are now rapidly gaining favour for top international productions of musicals, plays, arena operas, concerts, dance clubs and artists, special effects soundscapes, as well as major corporate promotional events.

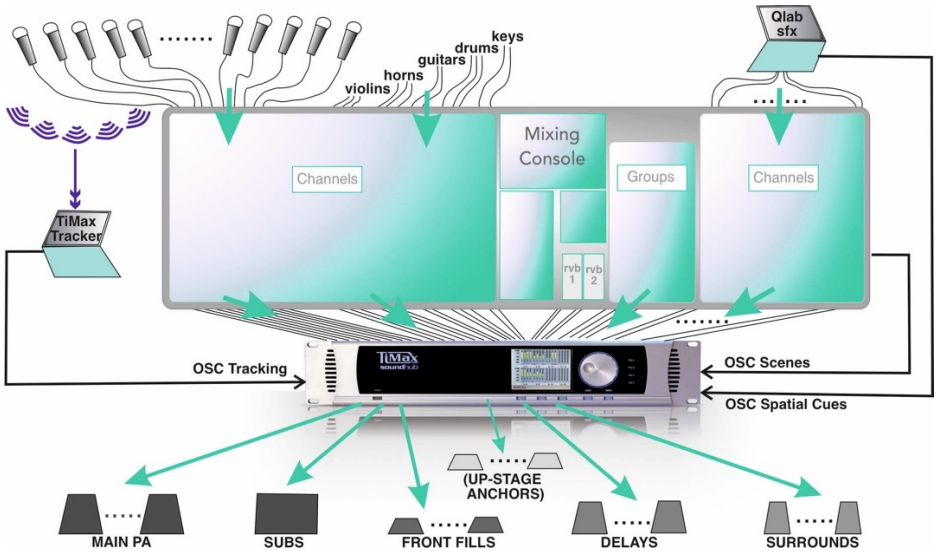
Although implementations can be very different in application and environment, typically their shared agenda is one of audience immersion and dramatic impact, often with the addition of enhanced panoramic, surround and animated audio effects.

Typical Signal Flow – Live

Mics and other Input sources are connected to the mixing console to use onboard preamps and processing, and for the operator the means to balance the mix

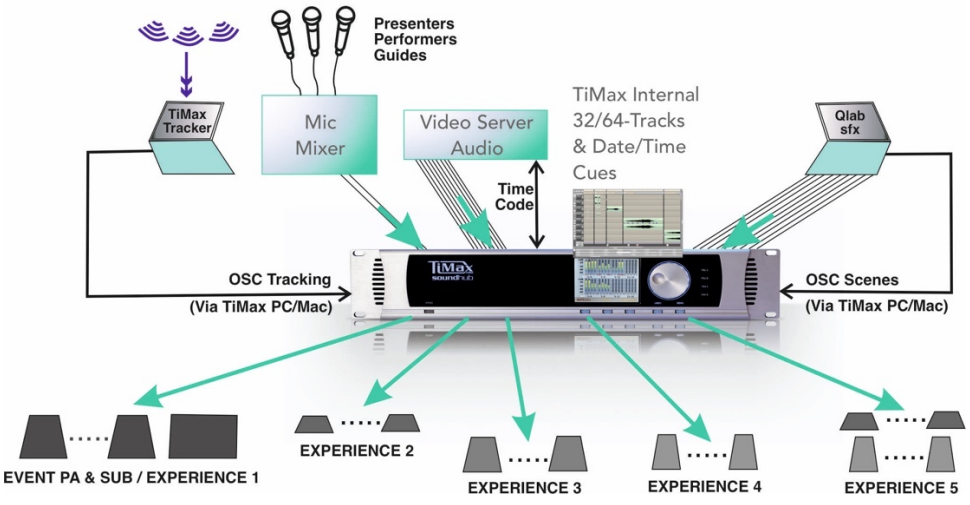
Console channel direct outs each go to their own TiMax Input if required to be separately localised, or grouped for shared localisation such as for chorus, choir or orchestra sections.

The Outputs from TiMax would then typically be connected directly to amplifier Inputs so each speaker or array location is driven individually.



Typical Signal Flow – Experience

An immersive experience patch follows the same principle but likely with more media server sources and often TiMax SoundHub internal audio Playback.



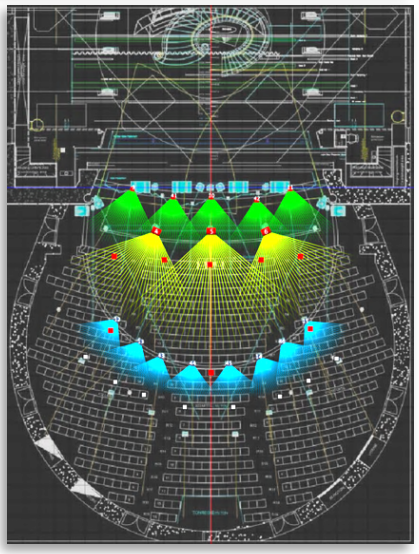
TiMax sound design Use-Cases

End-on Proscenium Theatre



This use-case shows the implementation a vocal amplification system on a proscenium stage for musical theatre or spoken word performance. Front fills are shown in green, the flown main vocal system is shown in yellow and the under balcony speakers in blue.

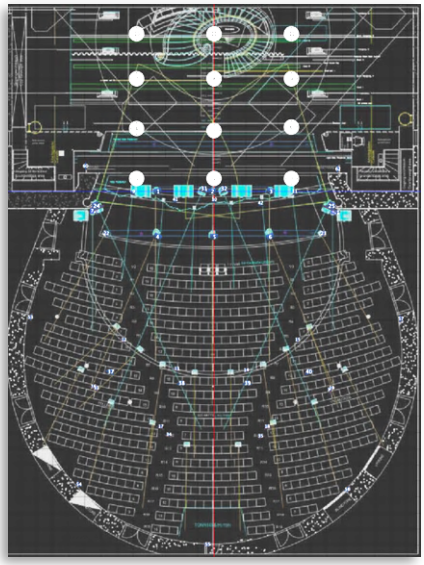
Speaker placements are chosen to amplify on-stage action with speakers pointing at the audience to reinforce acoustic energy and direction from the stage with the minimum angle of deviation from the stage.



The second criterion is to minimise the areas of overlapped coverage and particularly to avoid any instances where speakers are cross firing from left to right to cover a central area as this will likely result in tonal colouration caused by phase cancellation.

The target objective is to get coverage of the entire seating area with speakers pointing at the audience from the stage.

Each loudspeaker is separately amplified and driven from its own TiMax Output. Separate loudspeakers for music reproduction and sound effects are not show for clarity.



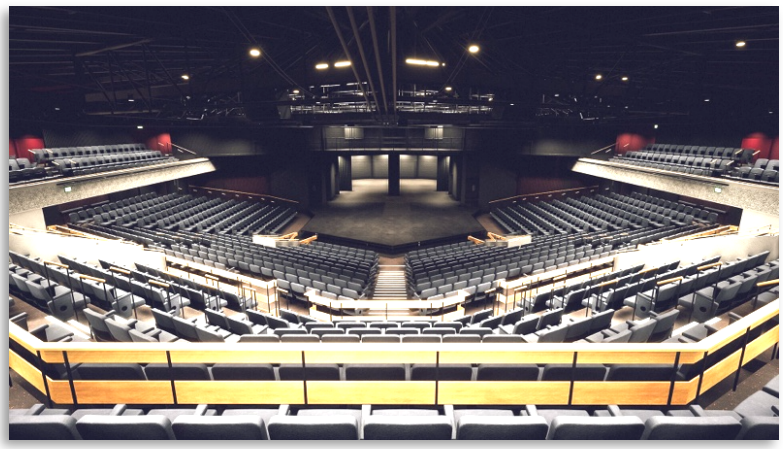
The stage is divided into zones by placing Image Definitions at each zone center. This example shows ImDefs at 3 meter spacing. This is generally a good choice for zone width.

Use the powerful auto-Calculate in TiMax renderse levels and delays for each Image and the system is ready for soundcheck in a matter of minutes.

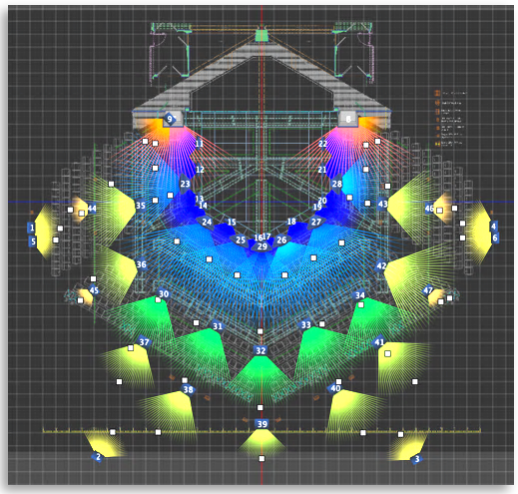
Level shading and system balancing can be trimmed quickly and easily.

Thrust Stage

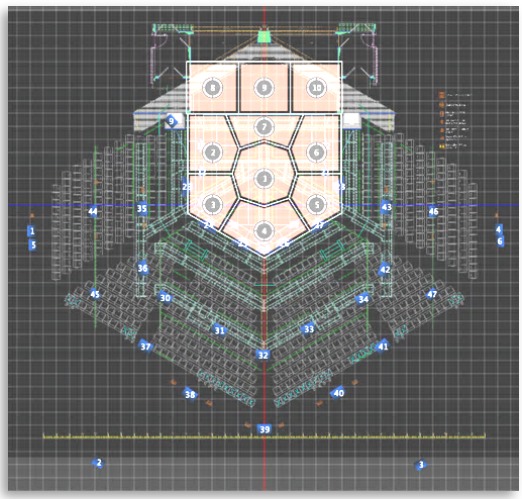
In this use-case of spoken word theatre for an audience of around 1,200 on a thrust stage where it is vitally important for every word to be clearly heard, which is extremely difficult without SOR techniques and performer stagetracking to achieve effective reinforcement.



This is because conventional sound reinforcement could only be in time with the acoustic voice of the actors at one point on the stage.



Conversely, the strategic application of SOR techniques on a thrust stage are extremely straight forward as the loudspeakers are almost always pointing in the ideal direction in order to achieve the aim of minimum angle of deviation between stage and speaker from the perspective of most of the auditorium seating positions.

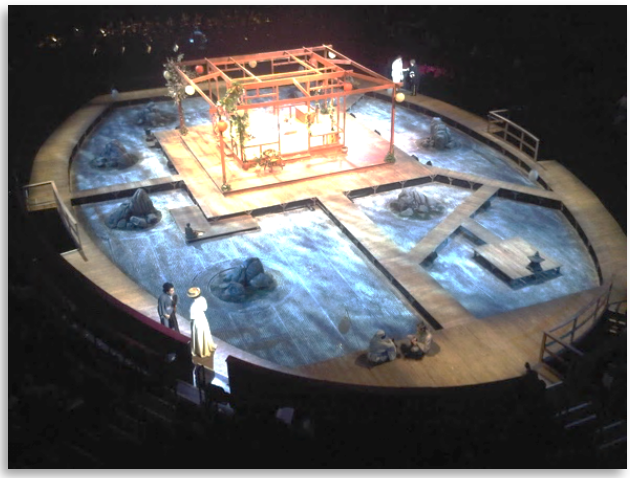


In this instance a zoned approach was taken with ImDef placement as continuous small shifts in delay to loudspeakers could otherwise causing some audible phasing artifacts in areas of overlapped coverage.

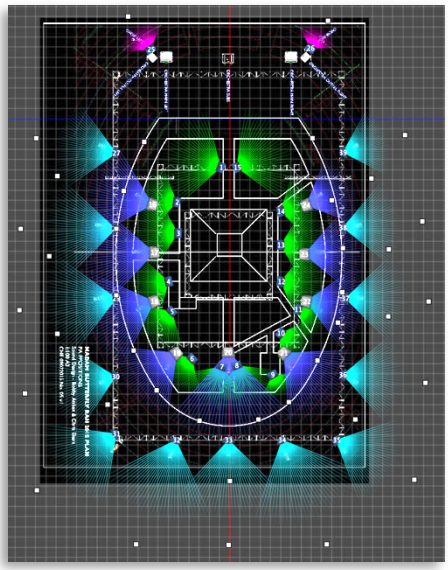
Choosing a zoned approach to implementation minimised this artefact, bringing it down to an almost inaudible level.

In The Round

In this use-case main sound reinforcement speakers are arranged as an exploded cluster spread around the edge of the performance space. This allows each loudspeaker to have a unique delay from each microphone thus enabling TiMax to keep the amplified and acoustic signals in time and maintain precedence from the singer or front-fill if the singer is off axis or far away.



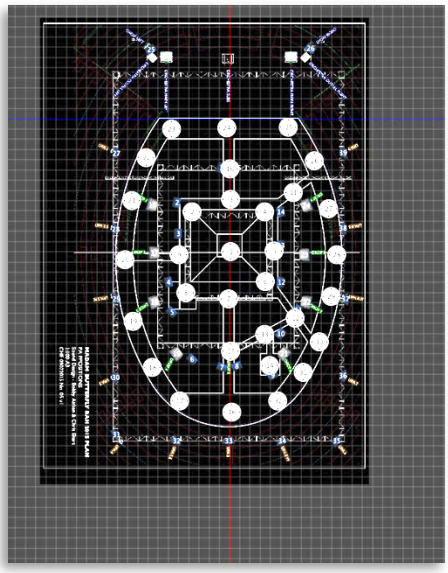
Front fills are built into the stage floor or disguised in scenery or props. These speakers fulfill the important task of keeping the sound localized down to the stage while the singer is off axis to the audience in that area.



In this example, Image Definitions were placed in and around the central stage area as well as along the walkways surrounding the main performance area.

Regions not mapped in this example are in fact filled with water…

It is important to have an understanding of how the software interpolates between ImDefs.



There are two modes of interpolation offered in TiMax software. In this example we are using continuous interpolation because we want all the loudspeakers working to amplify the voices all the time. There is a Zoned mode of operation which gets applied often as appropriate in other cases.

When an Input is right on top of an ImDef the absolute value of that ImDef is applied to that Input as the Input moves away from that ImDef, the software morphs levels and delays between the closest 5 ImDefs and depending on the relative square of the difference in distance the closest are used and the furthest are progressively ignored.

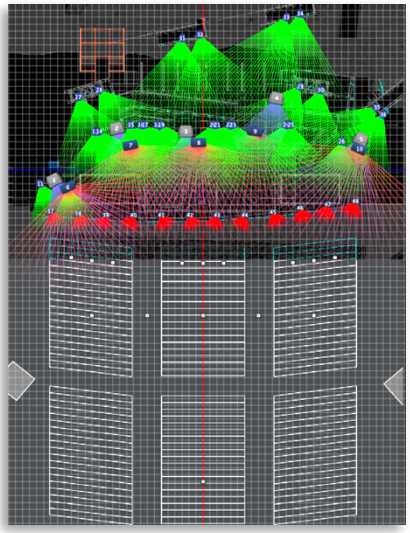
Outdoor Arena Opera

This use-case has TiMax SoundHub and TrackerD4 combine on a large scale outdoor arena to direct audience attention to performer positions and movements.



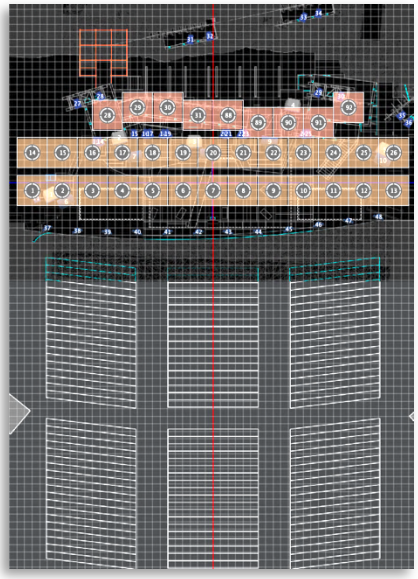
In this example the set was 60 meters wide and the audience area around 70 meters from the stage to the last row of seats.

The loudspeaker system was required to cover the entire audience area from speakers built into the set.



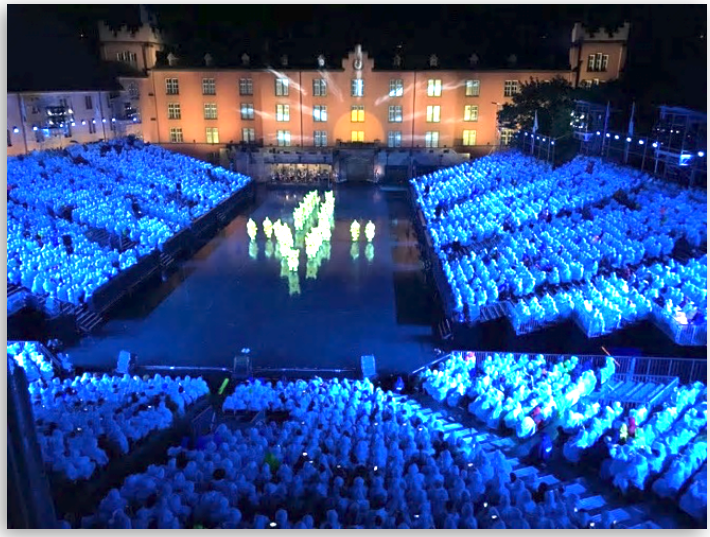
The front-fill speaker are working all the time and delay managed to keep the first wavefront in time with the singers voices while the other vocal reinforcement speakers are effectively switched on and off as the actors move around the stage. These are high power line source type speakers that are specified to cover the entire auditorium.

The Image definitions are set to be zoned which is indicated by the coloured area surrounding the ImDef. Performers are tracked using TiMax TrackerD4 which drives the Input positions via OSC to TiMax.



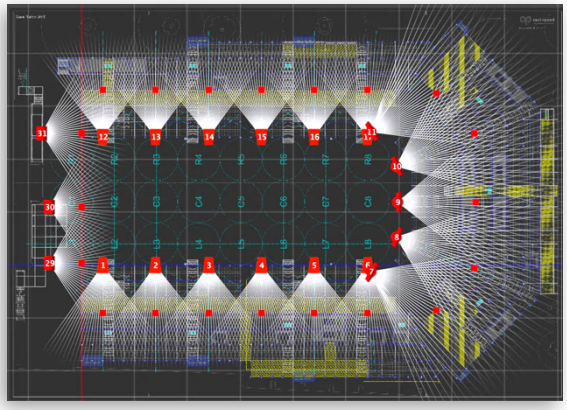
This mode means that while the performers are within the zone boundaries only the ImDef at the center of the zone is applied to the Input, there is no gradual morph from one ImDef to the next closest one as the performers move around the stage. When the performers move across a boundary from one ImDef zone to another the software crossfades between the two ImDefs at the rate defined in the System Preset.

Military Tattoo



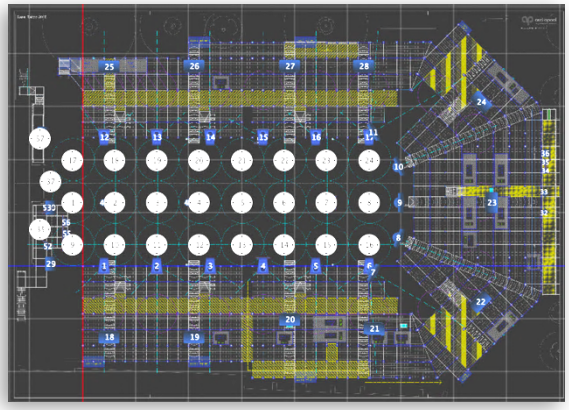
This use-case has Left and right seating stands are covered by six loudspeaker arrays mounted on poles down each side of the arena. Each array consisting of one long throw loudspeaker covering furthest seats and two near field loudspeakers covering seats near the front.

The end block of seats are covered by ground stacked line array systems with bottom boxes shooting just over the heads of the front rows and top boxes aimed to reach the back rows.



The primary consideration is to keep acoustic and amplified signals in time no matter where the source is located in the arena and from all listening positions in the arena.

The main performance area is mapped with ImDefs as in other examples. In this case only the ImDefs for microphones are shown, there are another set for esplanade monitoring and ambient mic positions.



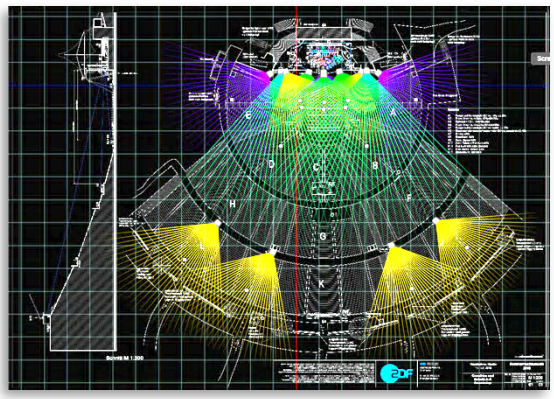
As the sound designer makes decisions during rehearsal which performers need reinforcemnt, TiMax picks up signals from the console which can then placed in the virtual stage in the software coresponding to their positon on the esplanade to ensure perfect timing of the acoustic with the ampified. As the amplified performers move around the field of play, their trajectories can be programmed, tracked or followed manually.

Orchestral Festival Reinforcement

In this use-case a huge outdoor stage delivers a full orchestral performance to a capacity crowd of 22,000 people. Most significantly, this and other examples created full spatial-mix immersion on a standard stereo L/R festival / concert PA system. This exclusive TiMax capability changes the rules for sound quality and audience immersion for mainstream live touring, concert and event audio.

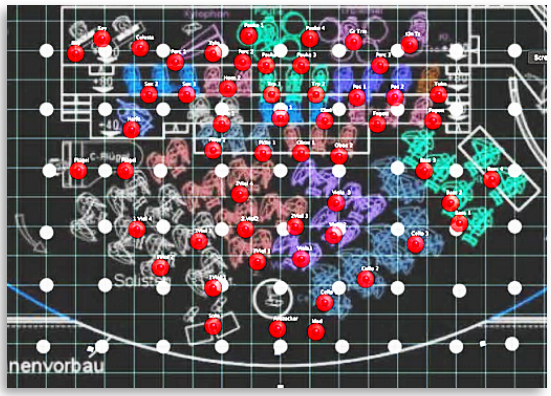


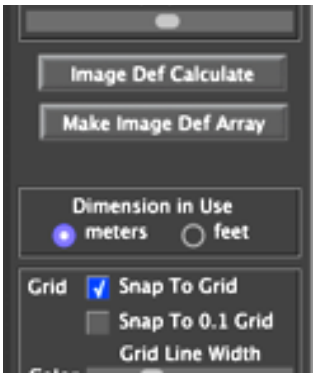
Speaker x,y,z positions are set in TiMax software. A timing target reference point for each speaker is also set.



The software uses this point to auto-Calculate time delays based on the difference in distance from the instrument microphones and the loudspeakers. That's why we sometimes call it the lucky seat..

The stage area is peppered with Image definitions by using the Make Image Definition Array feature, to prepare in advance for all final microphone positions. Levels and delays to all speakers are then auto-rendered by selecting Imdef and relevant speakers, then Calculate.

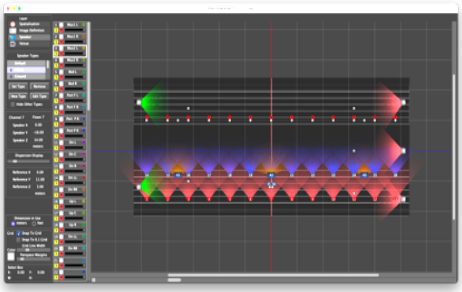




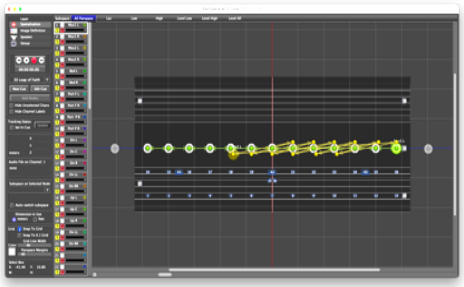
ImDef Delays and level shading can be re-rendered live while audio is running during sound check to get the best level balance across the speakers for the most accurate spatial reinforcement. When the orchestra mics are set, they are placed in the PanSpace spatialisation layer as objects, to time each microphone perfectly to each loudspeaker coverage area so it images perfectly for the whole audience.

Large-Scale National Event

This use-case is a high profile national celebration on a purpose built 100m long enclosed esplanade with seating along both sides.



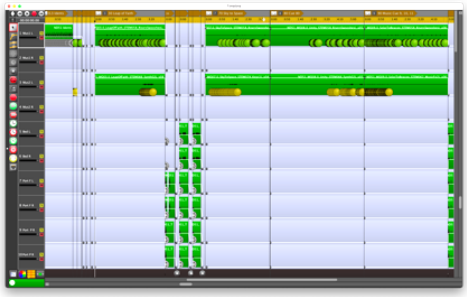
Content is live orchestra, Playback and sound design elemets to support video mapping, lighting and actors, processions and floats.



Audio control is located around 100m from the FOP (Field Of Play) so it was necessary to setup a TiMax Outputs for local monitoring that reflected movement and placement in the arena.

TiMax was deployed to spatialise the sound design element of the show, this falling into two categories; sound design as part of the musical score and sound design scenic linking.

In the first case Playback source is from the main music playback server.



To program movement against the audio timeline, the stems are imported into TiMax so movement and spatalisation can be programmed against the audio waveform. In the second case the TiMax Playback server is responsible for delivering audio to the speaker system.

In preparation, numerous layers of Image Definitions were created using various combinations of the 26 ground and 26 flown speakers, 4 end arrays and distributed subs. Once the speakers are placed in the software, levels and delays for multiple scenarios are calculated in a click to cater for all eventualities.



A networked control computer allowed these to be reviewed on the (then building site) FOP and the most effective chosen.

A set of pans were programmed in the PanSpace environment into template Cues and copy pasted over the audio waveforms in the TimeLine environment. This workflow caters for final content arrival at the 11th hour.

TiMax Cues were triggered by OSC messages from the main show Playback server.

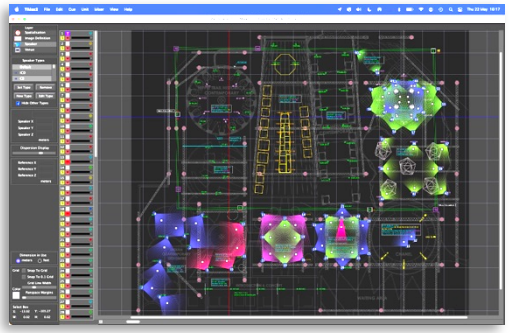
Multi-Zone Immersive Experiential

This use-case is a multi-zone fashion exhibition where individual brand and historic style displays were each accompanied by their own immersive music and effects soundscape.



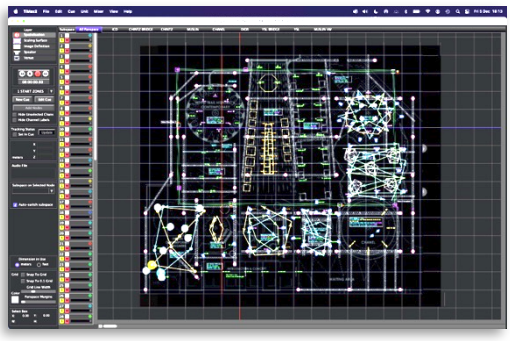
The content consisted of bespoke instrumental and electronica compositons, each with unique sound designs, some stereo and some multi-layered 3D immersive multichannel audio

Two TiMax SoundHub units fed 128 Genelec POE Dante speakers, with individual TiMax Cues running each separate fashion brand or themed exhibit zone.



Date/Time triggers in the TiMax units autonomously started the multiple Show Cues using a Go Cue follow-on sequence with a fade-in at 10am, then a similar sequence was triggered at 6pm to perform slow fade-outs and Stop Cues. This sequence ran non-stop for three months without intervention or supervision.

An iPad was provided for each set of 6 or 7 zones, featuring TouchOSC GUIs with Master and Zone level trims in case management required them, plus Master and individual Zone Start and Stop buttons in case they were needed for out-of hours VIP visits or media interviews.



To enable off-site studio pre-programming by the project's composers and soundscape designers, each TiMax Zone's set of Image Definitions contained four virtual monitor downmix speakers, oriented so that as the team programmed and auditioned in the studio, TiMax would simultaneously be rendering the spatialisation for the actual real Zone Outputs.

This meant that when the creative team ran the Zones up on-site they were immediately already spatially rendered accurately for each space, only needing small amounts of fine-tuning or slight mix adjustments to fully bed them in.

MIDI Specification

The MIDI driver does the same thing for both ports with notable exceptions in how it deals with controller messages.

So, for example:

- Incoming MTC can be plugged into either port.
- Note-On message on either port will trigger a Cue if one is so programmed.
- Program Change message on either port will trigger a Cue if one is so programmed.

A continuous controller message can be sent to either port, but it does different things depending on the port:

On port 1: set group level

On port 2: recall image definition

MIDI message details, (the byte values are as sent on the MIDI cable, i.e. before the GUI "Japan vs. U.S." interpretations take place)

For set group level:

// Status byte is continuous controller byte, 0xBn, where n is MIDI channel

// 2nd byte (MIDI controller number) is group number 0..31

// 3rd byte (MIDI controller value byte) is level 0..127

For recall image definition:

// Status byte is continuous controller byte, 0xBn, where n is MIDI channel

// 2nd byte (MIDI controller number) is Input channel number 0..63

// 3rd byte (MIDI controller value byte) is img def number 1..127

NB TiMax does not respond to running status meassages.

Hotkeys

TiMax Software Key Shortcuts

Order	Menu	Command	Shortcut (Qt)	HotKey Mac	HotKey PC	Mac Offline	Mac Online	PC Offline	PC Online
1	File	Save Show	Save	command S	control S	√	√	√	√
2	File	Save Show As	Shift+Ctrl+S	shift command S	shift control S	√	√	√	√
3	File	Save Show All Units	Shift+Alt+Ctrl+S	shift command option S	shift control alt S	na		na	
4	File	XML Show Viewer	Shift+Ctrl+X	shift command X	shift control X	√	√	√	√
5	File	Make Show Archive	Shift+Ctrl+A	shift command A	shift control A	√	√	√	√
6	File	Load Show Archive	Shift+Ctrl+L	shift command L	shift control L	√	√	√	√
7	File	Import from Show File	Alt+Ctrl+I	command option I	control alt I	√	√	√	√
8	File	Import Image Definitions from CSV File	Alt+Ctrl+V	command option V	control alt V	√	√	√	√
9	File	Export Image Definitions to CSV File	Shift+Ctrl+V	shift command V	shift control V	√	√	√	√
10	File	Import IO Labels from CSV File	Alt+Ctrl+L	command option L	control alt L	√	√	√	√
11	File	Export IO Labels to CSV File	Shift+Alt+Ctrl+L	shift command option L	shift control alt L	√	√	√	√
12	File	Import On-Cue Labels from CSV File	Alt+Ctrl+R	command option R	control alt R	√	√	√	√
13	File	Export On-Cue Labels to CSV File	Shift+Alt+Ctrl+R	shift command option R	shift control alt R	√	√	√	√
14	File	Print Cue List to File	Alt+Ctrl+P	command option P	control alt P	√	√	√	√
15	File	Print Audio List to File	none			na	na	na	na
16	File	Get Firmware Memory Log	Shift+Alt+Ctrl+F	shift command option F	shift control alt F	na	√	na	√
17	File	Get System Error Log	Shift+Alt+Ctrl+E	shift command option E	shift control alt E	na	√	na	√
18	File	Convert tma files to aiff	none			na	na	na	na
19	File	Open TiMax Files Directory	none			na	na	na	na
20	File	Clear Software Settings	none			na	na	na	na
21	File	Quit	Quit	command Q	control Q	√	√	√	√
22	Edit	Undo	Undo	command Z	control Z	√	√	√	√
23	Edit	Redo	Redo	shift command Z	control Y	√	√	√	√
24	Edit	Cut	Cut	command X	control X	√	√	√	√
25	Edit	Copy	Copy	command C	control C	√	√	√	√
26	Edit	Paste	Paste	command V	control V	√	√	√	√
27	Edit	Duplicate	Ctrl+D	command D	control D	√	√	√	√
28	Cue	New Cue	Shift+Ctrl+N	shift command N	shift control N	√	√	√	√
29	Cue	Go Next Cue	Shift+Return	shift return	shift return	√	√	√	√
30	Cue	Edit Current Cue	Shift+Ctrl+E	shift command E	shift control E	√	√	√	√
31	Cue	Edit Next Cue	Alt+Ctrl+E	command option E	control alt E	√	√	√	√
32	Cue	Update System Preset	none			na	na	na	na
33	Cue	Recall System Preset	none			na	na	na	na
34	Cue	Duplicate Current Cue	Shift+Ctrl+D	shift command D	shift control D	√	√	√	√
35	Cue	Duplicate Next Cue	Alt+Ctrl+D	command option D	control alt D	√	√	√	√
36	Cue	Delete Current Cue	none			na	na	na	na
37	Cue	Delete Next Cue	none			na	na	na	na
38	Cue	Renumber Cues	none			na	na	na	na
39	Unit	Scan / Go Online	none			na	na	na	na
40	Unit	Connect at IP	Alt+Ctrl+N	command option N	control alt N	na	√	na	√
41	Unit	Unit Information / Configuration	Ctrl+I	command I	control I	√	√	√	√
42	Unit	Transfer Audio To Unit	Shift+Ctrl+T	shift command T	shift control T	√	√	√	√
43	Unit	Clear Disk Drive	none			na	na	na	na
44	Unit	Delete All Audio Files	none			na	na	na	na
45	Unit	Delete All Show Files	none			na	na	na	na
46	Unit	Install New Firmware	Shift+Ctrl+I	shift command I	shift control I	na	√	na	√

Conformance

TiMaxSpatial
Martin Audio Ltd. Century Point, Halifax Road, Cressex Business Park,
High Wycombe, Buckinghamshire, HP12 3SL, England
TEL: +44 (0)1223 208183
Email: info@outboard.co.uk http://www.outboard.co.uk

Declaration of Conformity

We declare that the apparatus specified below conform to the following standards.

Reference to Specifications under which CE conformity is declared.

IEC EN 61000-6-3 Electromagnetic Compatibility (EMC) – Part 6-3: Generic Standards – Emissions stand for Residential, Commercial and Light-Industrial Environments

IEC EN 61000-6-4 Electromagnetic Compatibility (EMC) – Part 6-4: Generic Standards – Emission Standard for Industrial Environments

Low Voltage Directive (2014/35/EU) Audio/video, information and communication technology equipment - Part 1: Safety requirements EN / IEC 62368-1:2014

Description of apparatus:

Equipment Name	TiMax SoundHub level & delay matrix rack system
Description of Equipment	DSP Audio Matrix Processor and installed option cards
Part Numbers:	T2 S32 Dante, T2 S32R Dante, T2 S32 MADI, T2 S32R MADI T2 S64 Dante, T2 S64R Dante, T2 S64 MADI, T2 S64R MADI
Option Cards:	T2 AIO Card, T2 MIO Card, T2 Dante 64, T2 Dante64X, T2 MADI64

Signatory:

Date:

Name: Dominic Harter, Managing Director

Signature: ……..

REGISTERED IN ENGLAND NUMBER: 4824341; WEEE REGISTRATION NUMBER: WEE/CJ0116XU

Technical Specifications

SPECIFICATIONS

2U 19” Rack mount steel chassis, 450mm / 17.5” deep, 10kg / 22lbs approx weight.

EMC shielded to conform to CE / UKCA interference emission and susceptibility requirements

Internal FPGA 48KHz / 96KHz selectable, CPU, SSD, MADI or Dante 32×32 (32-Track); 64×64 (64-Track). Hardware boot-time 18 seconds

Headroom: +22dBu; Dynamic Range:114dB; THD+Noise: <0.002%, 20-20KHz; Fixed latency: <2ms

Dynamic delay-matrix processing, with proprietary transparent real-time levl/delay-morphing algorithms, max delay on all matrix cross-points 1000ms. Additional programmable static delay 0-42ms available on all Outputs

---

STANDARD: Dante64: 64-in & 64-out, 48KHz interface module.

Or

STANDARD: MADI64: 64-in & 64-out 48KHz / 32-in & 32-out 96KHz interface module on BNC and Optical, plus BNC Word Clock in/out

OPTIONAL AIO Analogue I/O card: 16-in & 16-out line-level in groups of 8 balanced signals on female DB25's (Yamaha analogue pinout)

OPTIONAL MIO AES Digital MIO I/O card: 16-in & 16-out AES3 on separate DB25's plus 16 analogue outs on two DB25's. (Yamaha analogue pinout for both Analogue and AES). Sync selectable from internal 48KHz or 96KHz clocks, external Word Clock source via BNC, or selected AES3 Input(s). Input and Output SRC's allow multiple sample-rates across different AES Inputs and Outputs

---

Two MIDI in/out DIN socket pairs, MIDI Prog / Note / MTC on both; also on Port1-In: MIDI Controllers can control Group faders 1-32; also on Port2-In: MIDI Controllers can control PanSpace Zone Input object changes.

RJ45 Ethernet (UDP) 100/1000Mb/s for PC/Mac control and XML/UDP remotes or showcontrollers. Up to four client computers, auto-config plug 'n play default with DHCP, static IP and forced IP modes

OSC control of Cues, Faders, XYZ panning/tracking, via bi-lateral ADM-OSC or customisable OSC strings

---

Dual Redundant Power Supplies: 130W universal voltage 80-265VAC at 50/60Hz. Conforms to European LVD, UL, CSA, Nemco safety requirements, filtered to conform to CE requirements. Conforms to UKCA requirements.

Dual Redundant Forced air-cooled fans with low fan noise.

Front panel LEDs indicators show if either PSU or Fan fails or not connected.

Feature Set

FPGA spatial audio processor core, switchable 48kHz or 96kHz, in configurations 32×32 or 64×64. Field upgradeable from 32 to 64 with license key

Dynamic delay-matrix spatialisation controllable by PanSpace, TiMaxTrackerD4 and external OSC.

Advanced holistic FPGA smooth delay-panning algorithms for ultimate transparency

Dante or MADI I/O as standard, with selectable 48kHz or 96kHz options

AES Input SRC's allow different 44.1 / 48 / 96kHz incoming sample rates on any AES3 Input pair (OPTION)

AES Output SRC's allow different 48 / 96kHz sample rates any clock source on any AES3 Output pair (OPTION)

8-band parametric EQ on Inputs, 8-band parametric EQ on Outputs, linkable

32 assignable and nestable Input and Output DCA Group level controls, also on front panel LCD

Input Source Submixer for Analogue (or AES) / Playback Track / Network on each Input channel

Live cross-fadeable Cue Snapshots between Submix sources, I/O levels, level/delay matrix routings.

Routing/level/delay-matrix

Cue Snapshots assignable to selectable individual or groups of I/O channels and parameters.

Image Definitions, EQ's, Groups, Channel Labels, System Preset exportable between shows

Multi-channel random-access 16-bit/48kHz audio Playback 32- or 64-track on 250Gb(min) SSD

Multiple TiMax units accessible from up to four Mac or PC control software clients

OSC Input control of PC/Mac software: levels, mutes, groups, Cues, Panspace spatialisation, 3D stagetracking control

Bi-directional OSC dictionaries, including ADM-OSC or custom strings, enable third-part integrations with QLab, Grapes3D, Atlas showcontrol, Digico, A&H, SSL consoles and more..

Front panel Menu: I/O Meters/Solo/Mute, Group Levels/Solo/Mute, Show select, Cue select, Utility, IP. Password protected

PanSpace adaptive auto-rendering of Image Definition localisation and spatialisation objects. Embedded TiMax TrackerD4 stagetracking functionality, per-channel tracking Enable/Disable within Cues

PanSpace Scaling Surfaces allows one or more spatialisation zones to be re-scaled from one venue to another, to facilitate studio pre-programming or moving between different tour venues

Integrated PanSpace and Time Line automated immersive spatial rendering on multiple SubSpace layers, scheduling and timing of Input object panning across level/delay Image Definition objects

TimeLine comprehensive audio Playback editing, mix automation, advanced audio showcontrol

Cue Input Triggers (FollowOn, MIDI/MTC, Show Clock, OSC) and Output Events (MIDI/MTC, UDP, ShowClock) programming. Timing and scheduling of PanSpace programmed trajectories. 256 matrixed GPIO Input trigger ports.