



# Delta Media Server Hardware Operation

User Guide



## Hardware Operation : User Guide

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## Introduction

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Delta Media Servers are custom-built around a range, configured to meet user requirements. This Guide covers all the common features. For user guides on Delta software and connectivity, media and server management, please see our [Online-Help](#) pages.

All servers are supplied with the appropriate Hardware User Guide. Copies of these can also be found on the [7thSense User Portal](#)

This guide covers server models from 2016 onwards:

- Infinity
- Nucleus (discontinued, January 2020)
- Proton
- NanoSDI
- Nano (discontinued June 2019)
- Pico (no front panel control or display; has GPIO connector)

## Installation

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### Unpacking

Unpack your server carefully onto a clean and level surface and examine it for any signs of transit damage. Contact your supplier immediately if anything appears to be damaged, or any parts missing. Please retain all packaging in case of future need to return a server.

### Supplied accessories

In your white accessories box, you will have:

- Power cable
- Server motherboard manual
- Windows CD
- Spare front panel air filter

Delta Servers above the Nano series are supplied with:

- 2 × rack rails and screws, for the server model supplied
- 4 × rubber feet and screws
- 2 × SATA cables to connect O/S backup SSD if necessary

Depending on specification, other accessories may include:

- SSD hex caddy key
- spare Genlock ribbon
- HDMI / DVI adapters
- spare blanking plate
- blanking plate with RS232 15 pin D-connector
- 4 × fan mounting screws
- Bag of miscellaneous fixings

### Lifting

Delta Media Server weight depends on model and specification, the weight is stated on the server's product label. Larger servers may require a two-person lift, especially when manoeuvring them into a rack. Observe your internal manual handling recommendations to avoid injury.

## Rack Mounting

Delta Media Servers (2U and 3U models) are supplied with rack mount slide rails and fixings. Ensure that each server is properly secured to the rack cabinet.

Delta 1U servers should be installed in a rack using a minimum of an M6 rack mount bolt in each of the top and bottom mounting holes on each side of the server's front panel.

To fit the rails supplied, follow the instructions included with the rails.

For Pico servers mounted in rack trays follow the [online user guide](#).

## Rack Stability Precautions

- Ensure the rack is stable (e.g. bolted to the floor) before sliding out the server.
- Do not place objects on equipment projecting from a rack (e.g. do not use as a shelf).
- Only slide out one piece of equipment from the rack at a time.

## Connecting External Equipment

To ensure best performance from the server and compliance with relevant EMC regulations, this equipment should only be used with high-quality shielded data and signal cables.

Only equipment and accessories approved to IEC 60950-1 and SELV circuits may be connected to the server. All equipment and accessories shall comply to the relevant standard for the server's port to which it is connected.

## Cleaning

External casing and the front panel should be carefully wiped with a soft cloth and antistatic solution.

## Environment

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### General

- Delta Media Servers should be operated in a clean, dry, dust-free area.
- The server is intended for operation in benign environments; that is, not subject to corrosive or explosive atmospheres, moisture or flammable gases. The server is non-protected against ingress of liquid (IPx0).
- The server is not designed to be subject to excessive mechanical shock or vibration.
- This equipment is not suitable for use in locations where children are likely to be present.



Only used at altitude not exceeding 2000 m



Only used in not-tropical climate regions

### Thermal

Do not block any of the server's air vents and ensure the ambient temperature around the server is compatible with the environmental characteristics stated below.

Particularly when mounted in a rack cabinet with front or rear doors the ambient temperature around the server may be higher than the ambient room temperature.

Pico servers can be mounted vertically using the optional VESA mounting plate, but care must be taken that hot air from the rear panel is not drawn back in at the front. Do not mount with the front panel uppermost.

### Electrical

Before connecting power to the server, ensure that electricity supply is compatible with the electrical ratings stated on the server's product label. The server shall not be connected to an IT (unearthed neutral) power distribution system and the mains socket-outlet used shall connect to the building installation ground.

The server is connected to and disconnected from the mains supply with the IEC 60320 power connector on the rear of the unit.

**Pico servers** must only be used with the 7thSense-supplied DC power blocks. The power supply unit is connected to, and disconnected from, the mains supply with an IEC 60320 power connector.





The low voltage output is connected to the labelled rear socket of the unit, where the lead can be secured to the chassis with the clip provided. Only use the 19 VDC power supply unit that is supplied by 7thSense with the Pico unit. Failure to do so may damage the Pico and invalidate any warranty.

### Environmental Characteristics (General)

	Operating	Non-operating
Temperature	+15 to +30 °C	-10 to +50 °C
Humidity (non-condensing)	10 to 90%	5 to 95%
Altitude	<2 000 m	<10 000 m

## Air Filter Replacement

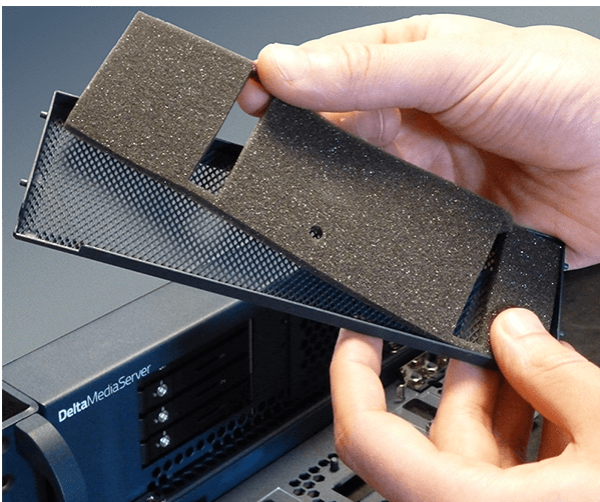
A user-serviceable air filter is located on the server's front panel. It is important to remove and clean or replace the filter periodically to avoid overheating. Delta Servers are supplied with one spare filter pad, others can be supplied by 7thSense. Servers should not be run without filters, since accumulations of dust inside the server can affect performance.

Before removing any filter, power the server down. This will avoid disturbing dust, which can then be drawn back into the server.

### Proton, Nucleus, Infinity



Pull down the filter door, and push the carrier forward evenly against the spring clips. Note the orientation of the carrier with the magnetic catch spot at the top.



Remove, clean or replace the foam, noting the orientation of the cutouts.

Relocate the bottom of the carrier, push against the springs and relocate into place.

## Nano

Delta Nano servers have a single screw on the left of the front panel holding the filter cover in place:



Withdraw the filter pad and clean or replace the foam. Re-engage the right-hand side of the door and tighten the securing screw.



## Pico

Pico servers also have a single screw holding the filter cover in place:



Remove the door and filter, clean or replace the foam tucking it under the left-side screw mount and noting the orientation of the filter. Re-engage the door on the right side, and secure with the screw.

## Front Panel

The front panel of all rack-width Delta Media Servers carries a display and Matrix Orbital control buttons (see [Front Panel Control and Display](#))<sup>41</sup>.

Below this you will find the on/off power switch, its green indicator light, and amber disk activity indicator.

Proton, Nucleus and Infinity servers also have 2 × USB3 sockets, and a flip-down door for [access to the air filter](#)<sup>10</sup>.



Prior to 2021, Delta Media Servers were dark blue, and incorporated a front-access [Media SSD Storage](#)<sup>28</sup> caddy, but otherwise operate the same:



Nano servers also have 2 × USB3 sockets. Their air filter is accessed using the thumbscrew on the left, and removing the filter panel:



Pico servers have two 3.5 mm audio, one USB 2.0 and one USB 3.1 Type-C port:









## Back / Rear Panel Connections

### Cables and Connectors

To ensure best performance from the server and compliance with relevant EMC regulations, this equipment should only be used with high-quality shielded data and signal cables.

### Audio connectors (3.5 mm TRS / mini stereo jack)

These are the Realtek defaults as used in Delta Media Servers.

-  5.1 / 7.1 Centre + Sub
-  7.1 Side L+R if grey is optical out – or Line in
-  5.1 / 7.1 Rear L+R
-  Stereo phones/speakers, or 5.1 / 7.1 Front
-  7.1 Side L+R, or position of optical out
-  Mic

Double-click a connector’s graphic in Realtek HD Audio Manager to enable the auto pop-up dialog. This enables you to choose which device has been plugged in, for example to assign the blue socket to ‘Side Speakers Out’ rather than ‘Line In’.

### Audio (stereo) TRS plug connections

**Tip** = Left channel

**Ring** = Right channel

**Sleeve** = Ground (common)

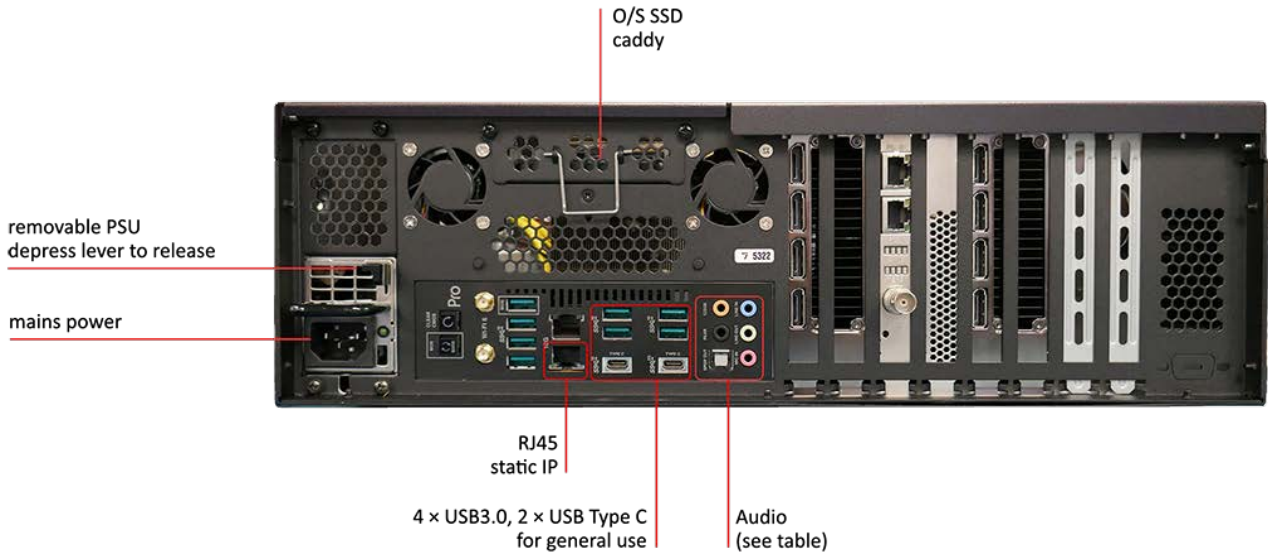
The audio channels as they appear in DeltaGUI are:

Delta channel	Socket colour	TRS connection	7.1 speaker config	5.1 speaker config
1	Green	Tip+Sleeve	Front left	Front left
2	Green	Ring+Sleeve	Front right	Front right
3	Orange	Tip+Sleeve	Centre	Centre
4	Orange	Ring+Sleeve	Sub	Sub
5	Blue	Tip+Sleeve	Side left	(unused)
6	Blue	Ring+Sleeve	Side right	(unused)
7	Black	Tip+Sleeve	Rear left	Rear left
8	Black	Ring+Sleeve	Rear right	Rear right

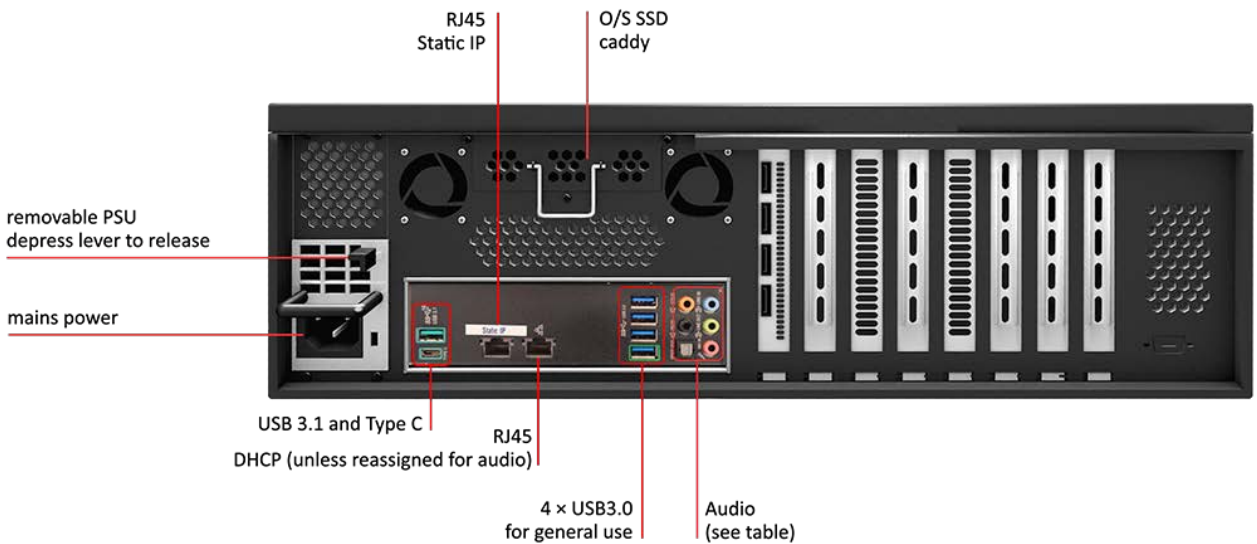


**Note:** if one of the motherboard audio channels is assigned to LTC, that motherboard channel becomes unavailable for output.

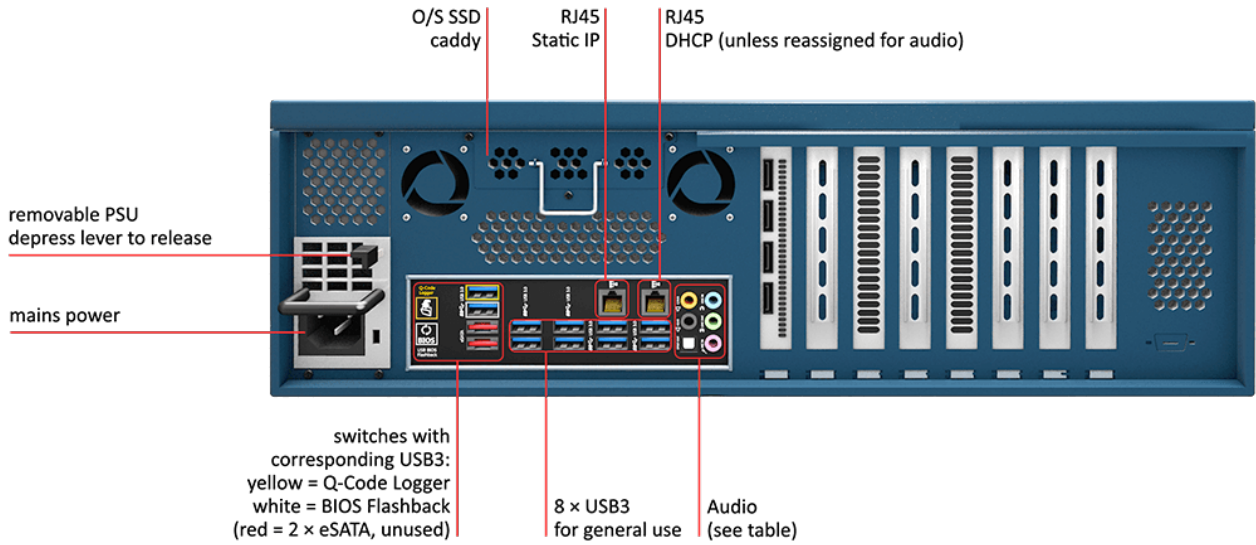
**Delta Infinity Model 2021g**



**Delta Infinity (after May 2020, serial numbers from 4565)**



**Delta Infinity (prior to May 2020, serial numbers to 4564)**

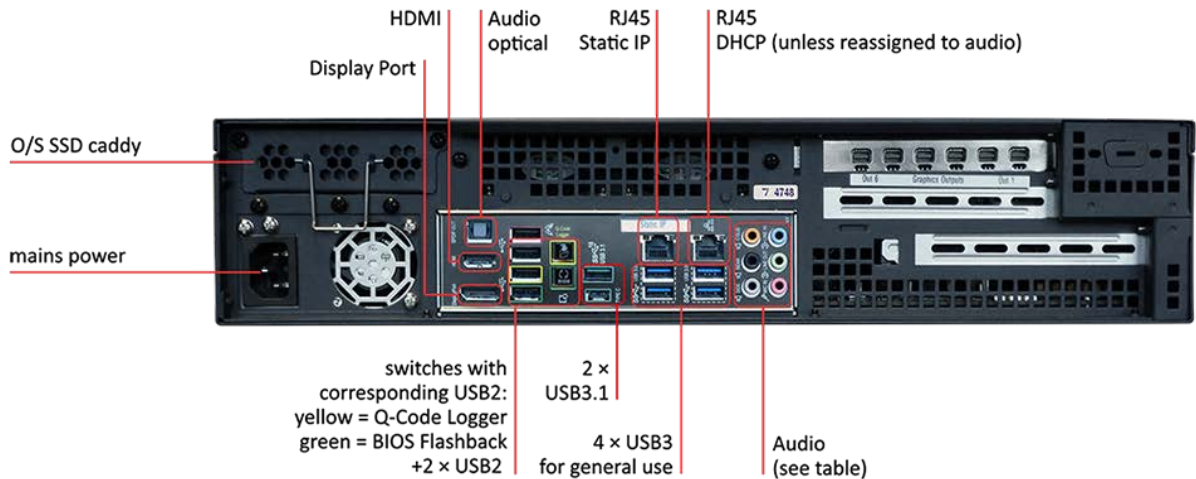


Delta Infinity servers can be fitted with a redundant power supply. When fitted, the second is above the one shown here, and both operate in parallel. If one unit fails, there will be an audible warning, and the indicator light to the right of the failed socket will go out.

Condition	LED status	Sound
Dual PSU, both good	Both green	none
Dual PSU, one PSU failed	Green-lit PSU good Unlit PSU failed	Audible alarm from the power distribution board
One PSU unplugged	This PSU unlit	Audible alarm from the power distribution board
One PSU removed	N/A	Audible alarm from the power distribution board

### Delta Proton or Nucleus

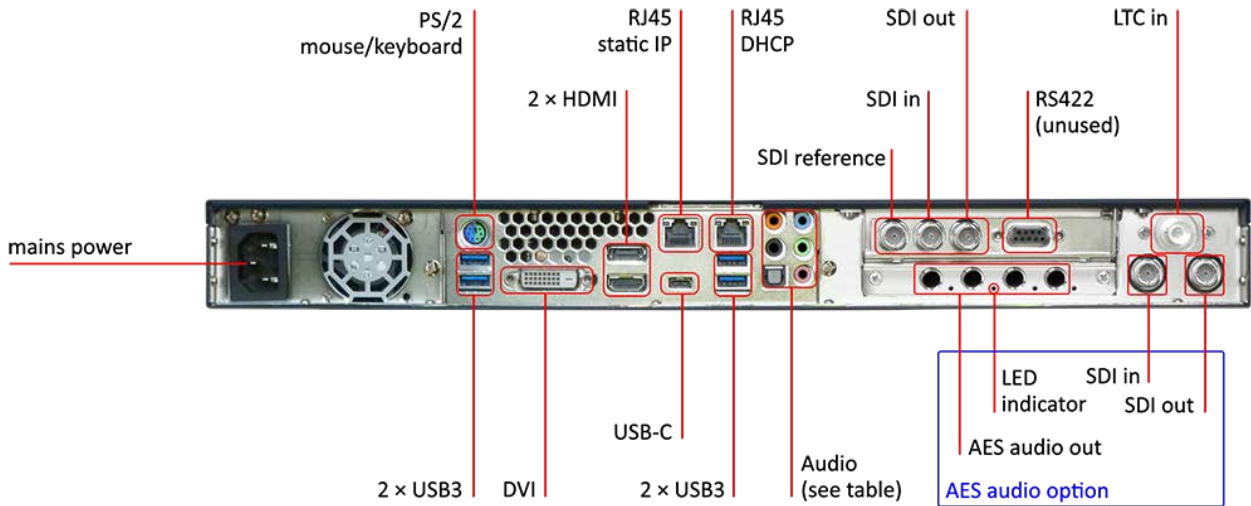
Both models share the same motherboard connections. The illustration shows a Proton; Nucleus is a 3U unit, with a removable power supply and vertical cards, as the Infinity, above.



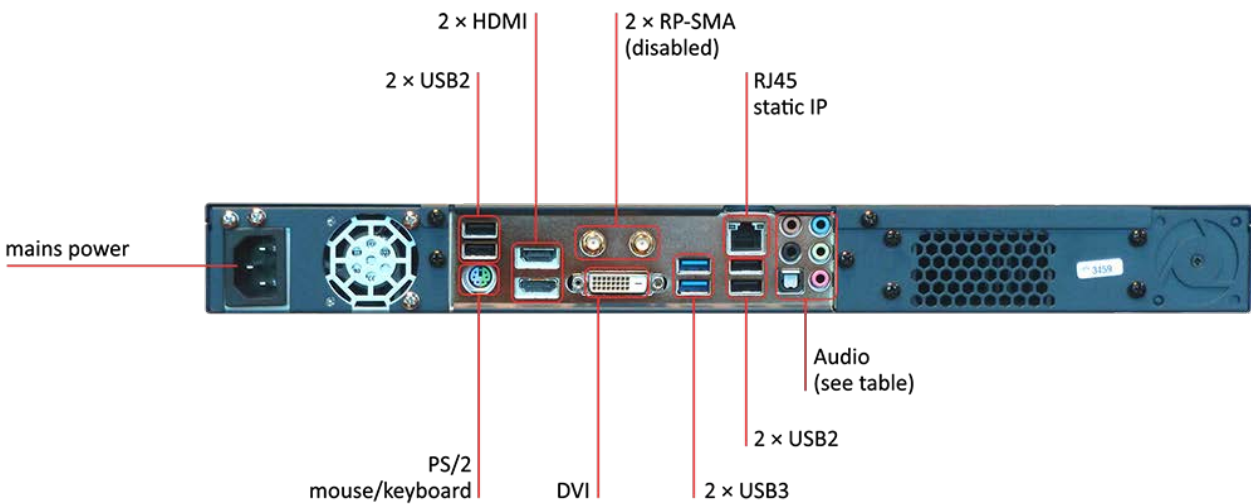


(Some connections may vary as motherboards change over time.)

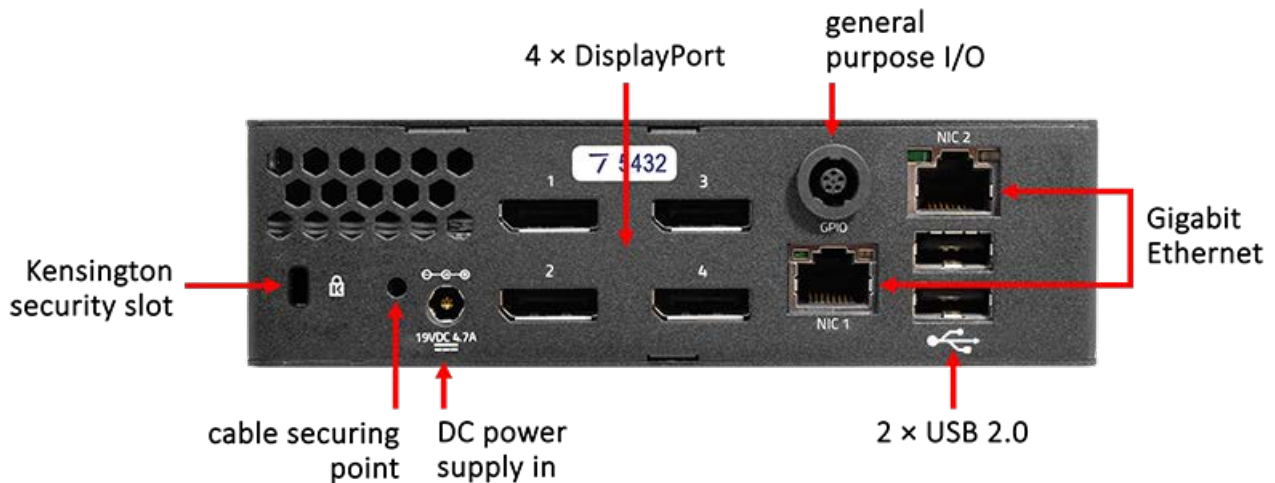
### Delta NanoSDI



### Delta NanoR



### Delta Pico



### Pico low voltage power supply unit

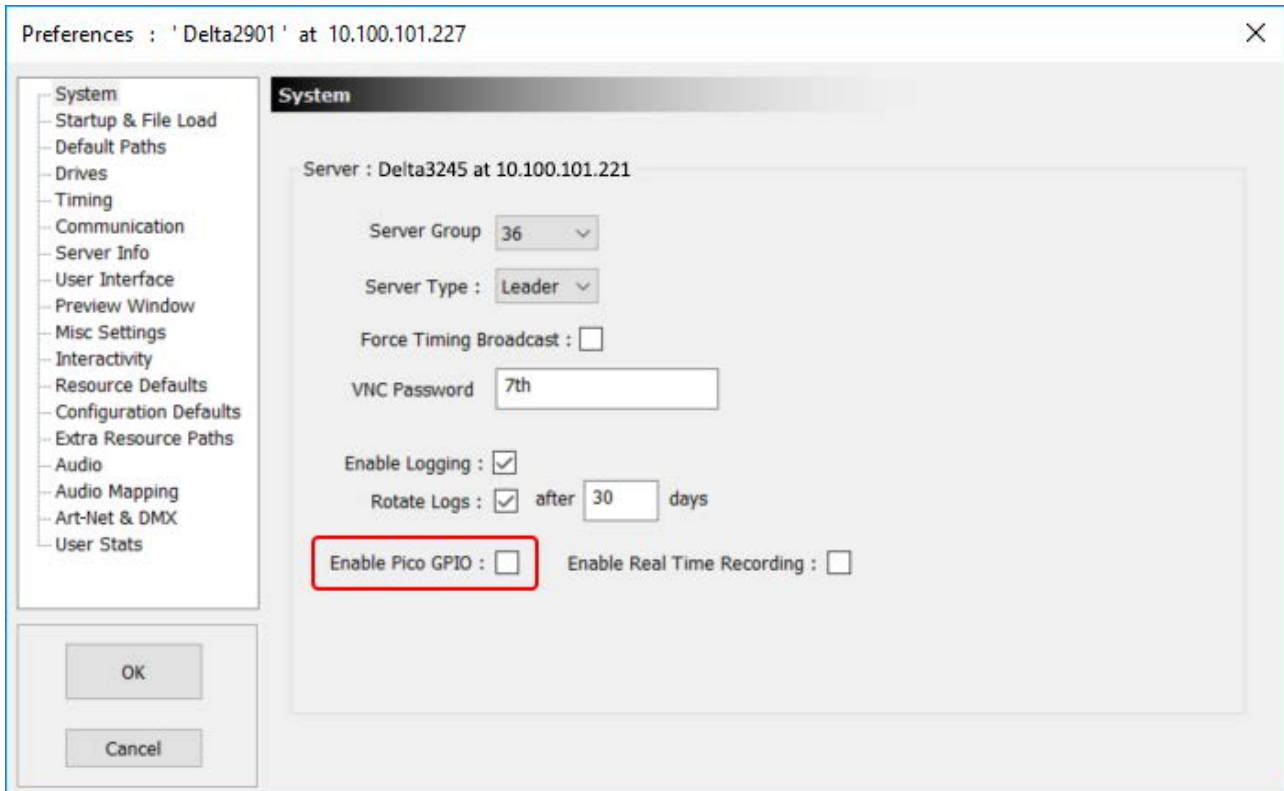
The Pico is certified for use with the 19 V power unit supplied by 7thSense, rated at 100-240 VAC ~ 3-1.5 A, 60-50 Hz. The operating voltage for Pico is 12-19 VDC.

### Pico NIC

On the rear right-hand side, the RJ45 port labelled 'NIC 1' is factory-set to a static IP and 'NIC 2' to DHCP. A label with this initial static IP address is provided on each unit.

### Pico GPIO

From Delta 2.7, GPIO connectivity is enabled in DeltaGUI > *Preferences* > *System*. When checked, the GPIO driver is loaded when the Pico is started:



GPIO functionality takes up some CPU overhead. Disable it if not required, to maximise performance.

GPIO inputs and output functions are set by Delta External Controls, which are listed in DeltaGUI > Help > External Control, under GPIO Commands:

GPIO (PICO) COMMANDS	
GPIO_ID	Flash the front LED green and orange to identify the server
GPIO pin state	Set the GPIO pin (1-4) to the desired state (0 = off, 1 = on)
GPIO bitwise	Set the GPIO pins to the desired bit pattern (0-255). 0 sets all pins low, 248 sets all available pins high, 176 sets pins 2, 3 high and 1, 4 low
GPIO_SET_INPUT pin	Set the GPIO pin (1-4) to be an input pin
GPIO_SET_OUTPUT pin	Set the GPIO pin (1-4) to be an output pin

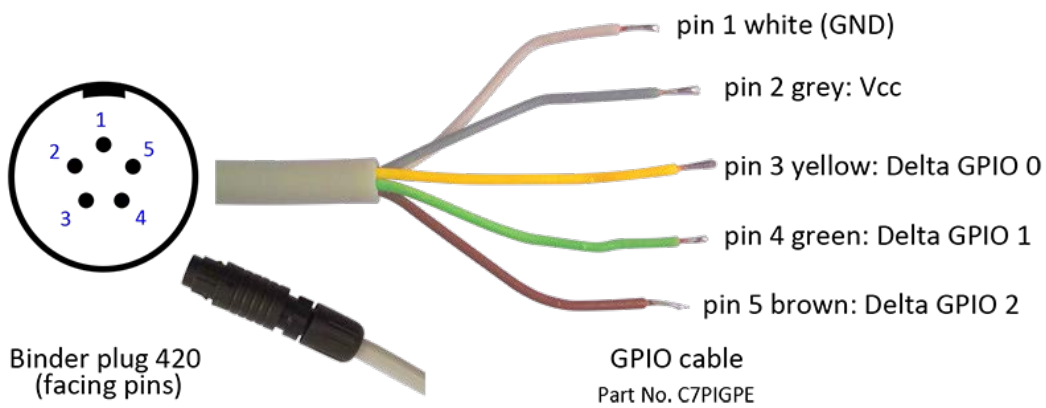
### Physical connections

**Pico servers with opto-isolated GPIO (serial numbers above 4600)**

These have a GPIO socket, wired as below, with 3 × I/O opto-isolated connections for use by Delta.

### Specification

- Voltage triggered level switching IO
- V (both Vcc and signal) max, 5 V. 3.3 V compliant so you can use either.
- Min Vcc is 3 V.
- I source 35 mA normal, 100 mA max.
- Max 400 pF output impedance.
- All data lines are weak pulled up to Vcc with 1 K resistors to allow for bidirectional switching.



## Removable Power Supply

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Delta Media Servers (3U models only – Nucleus and Infinity) are fitted with a removable power supply unit (PSU). This can be replaced as follows:

- **To remove:** Power down the server and then remove the IEC320 power connector from the server's PSU.
- Press the PSU's release tab and pull the handle to slide the power supply out of the server:



- **To replace:** Slide the replacement power supply into the server until it fully clicks home.
- Refit the IEC320 power connector and power on the server.



**Warning:** The IEC320 power connector should never be inserted into the PSU when the PSU is not fitted in a server.

## Spare O/S Drive

Most Delta Media Servers have a removable O/S drive caddy. (See [Back Panel Connections](#) <sup>14</sup>, and this is also true of older models.) This carries the O/S and all C:\ drive drivers and configurations, media and resources. It is important to keep a clone backup of this post-integration, in case of drive failure, so that you can restore the server to operation quickly.

For Delta 2.5 and above, the optional [Stack Backup and Restore](#) facility can do this. The alternative is to use Paragon backup/clone software.

As with all components O/S drives can begin to fail with age. Signs of an approaching failure can include intermittent boot failures on start-up, which are superficially remedied though reboot. Generally, these issues come on slowly, increasing in frequency until final catastrophic data loss. If boot failures begin to present themselves heed the warning, ensure full backups are present, and that you are confident in the process of OS restoration/deployment to a new drive.

Preventative maintenance is of course always preferred route to ensure the least possible downtime for the user. In case of C:\ drive replacement, you will need to know the following in order to fully reconfigure your system (see [Installation Records](#) <sup>59</sup>):

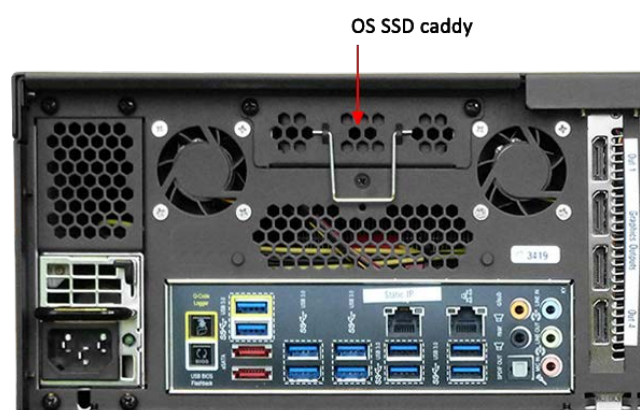
- graphics configuration (Eyefinity for AMD, Mosaic for NVIDIA)
  - graphics EDID
  - graphics driver and version
  - server IP address, and any IP configurations
- see [Display Configuration for Delta Servers](#)

### Power down the server.

Remove the two retaining screws for the caddy:



Example: older Infinity server



Example: newer Infinity server; motherboard connections may vary



In the caddy, there are two SSDs: one for the C:\ drive and one spare, containing a factory-settings clone. The caddy is secured by two screws, which when released allow the tray of two SSDs to be withdrawn from its internal connectors:



The SSDs are each held in place by four small screws. The upper disk is the spare (factory clone), and the lower is the C:\ drive.

- Mark the spare drive replacement (e.g. write 'R' on the green sticker) and remove it.
- Remove the failed or failing SSD, label it appropriately (source, date, type of failure), and keep it, with its four mounting screws. Do not reinsert it back in the server.
- Replace the spare SSD in the lower position.
- Replace the caddy in the server and secure it with the original two screws.
- Purchase a replacement SSD from 7thSense, in the event of a subsequent failure.

## Restoring the C:\ drive

The factory-clone image on the spare SSD will provide your operating system. You will need to restore a backup of all your media and resources, and if you do not have a clone of the previous SSD, you will need to reconfigure your graphics card(s). Only use the driver originally provided for this, since these have been tested with the card(s) in the server.

## Create your own clone

The alternative is to create your own backup clone.

## Backup and Recovery

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### Clone vs Backup

Users of Delta 2.5 and above, who have the [Stack Backup and Restore](#) software can easily maintain backups of their servers, and selectively backup all DeltaServer and DeltaGUI configurations, media and resources.

This does not clone the operating system or hardware drivers, audio or graphics configurations. You may therefore choose to clone your entire C:\ drive once your systems have been fully installed, as an update on the factory-build clone as supplied on the spare O/S SSD.

### Paragon® Backup & Recovery™

Delta Media Servers are provided with a stable Windows operating system, tested and proven hardware drivers, and no automatic updates. It is important that in the event of an O/S disk failure, this installation is replicated and restored. Making a clone is therefore one of the most useful insurances you can take.

We recommend Paragon Hard Disk Manager for Windows, which includes Paragon Backup & Restore, or just the Backup & Restore program. You will need an adequate USB external storage device, or networked storage, allowing up to 30 GB for all system and program files. This will depend on the system setup, but check what you need before you start. Paragon software has its own comprehensive user manual, but here are some overview steps.

**Download** your selected programs and manuals from [kb.paragon-software.com](http://kb.paragon-software.com) and transfer everything to the Delta server. We recommend creating a folder: C:\7thSense\Software & Drivers\Software\Paragon and installing to the default Program Files location, with a desktop shortcut.

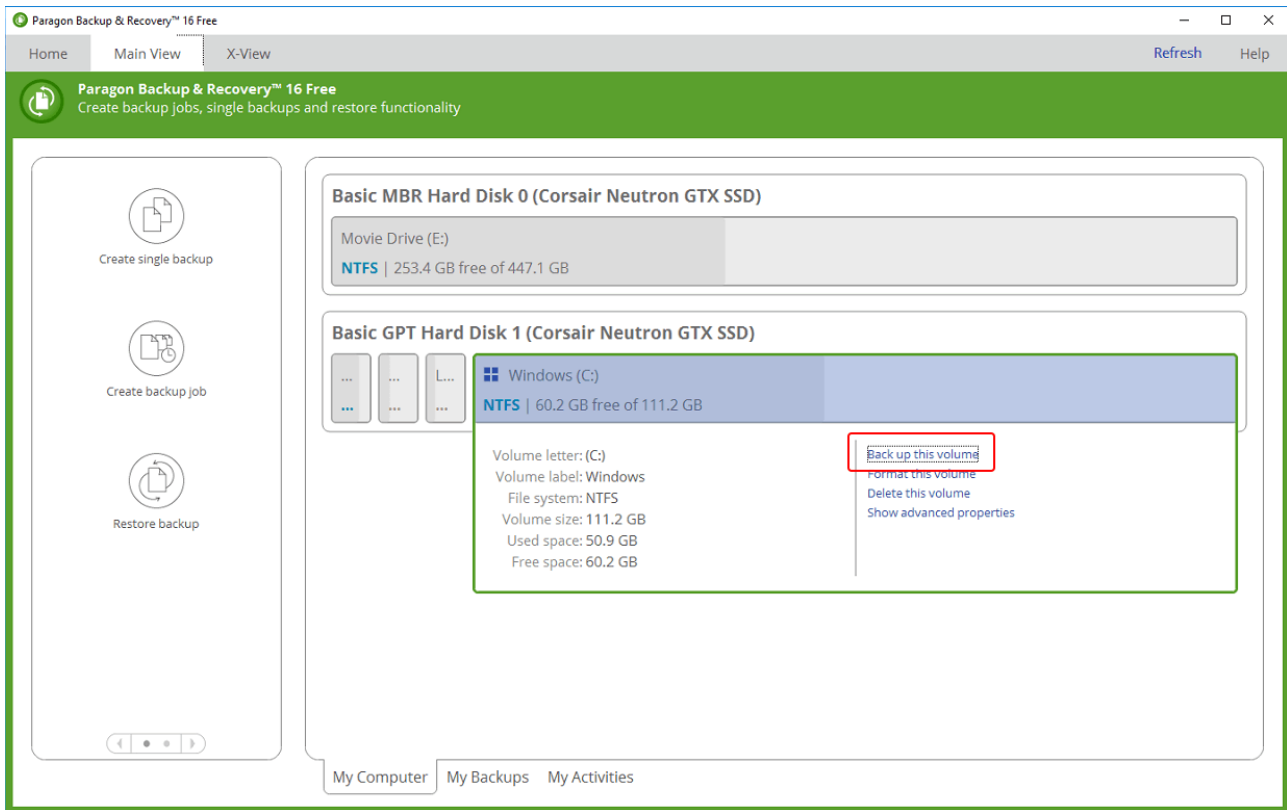
**Install** the Paragon software and register your product. Make sure that you do not allow any automatic updates.

**Activation** normally requires an Internet connection, but the Paragon website 'MyParagon' customer portal allows you to sign in and activate online from another PC. This will provide you with an .xml license file to copy onto your offline server. You will have the option then to 'import a licence file' to activate the product.

**The purpose described here** is to create a one-off original clone of your Delta server C:\ drive, and your system configurations, not the audio or visual media. These should always have copies elsewhere in any case.



Open Backup & Restore and in the Main View tab, select the required disk, and then from the right-hand menu, 'Back up this volume':



The Single Backup wizard will ask you to:

- name and describe the backup
- choose a target (choose either an external device or a network location)
- (if you select advanced settings) set degree of compression and/or maximum file size.

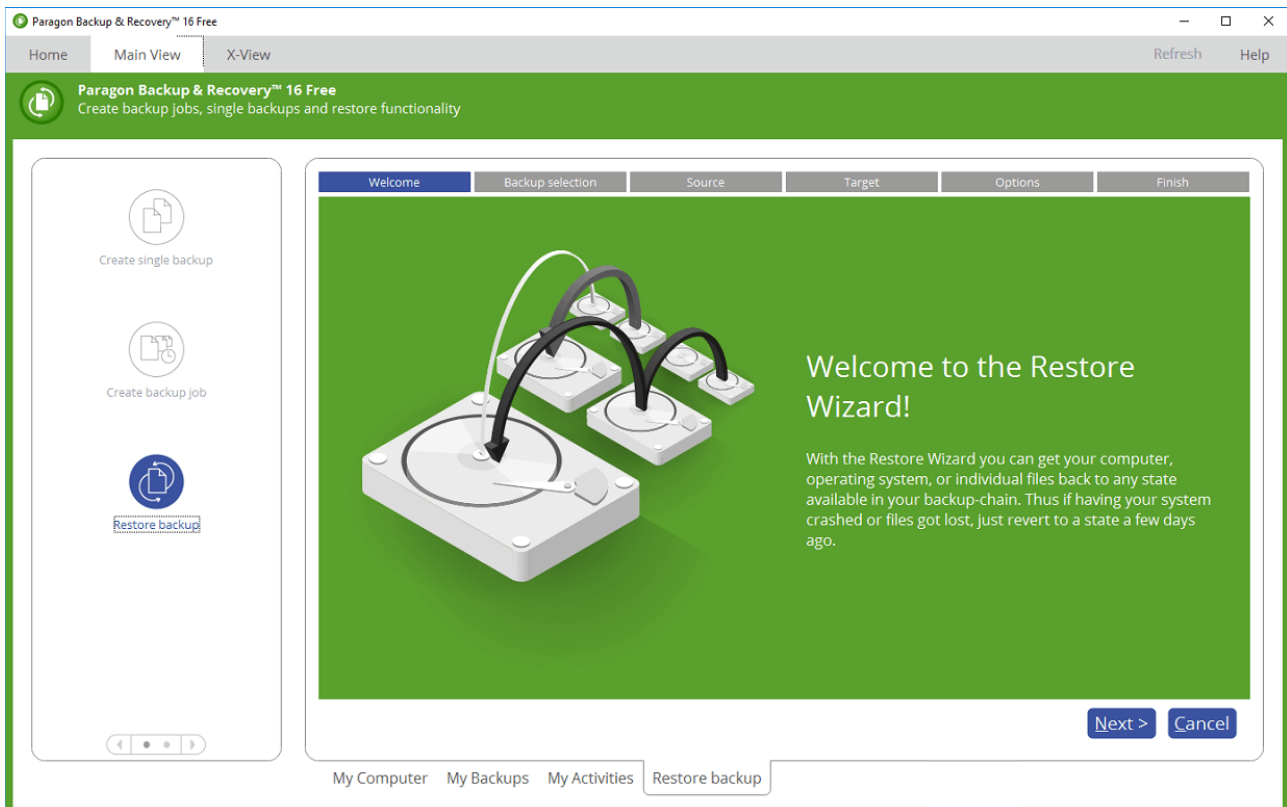
Finish the wizard to start the single backup. The backup folder will contain a series of files like these:

Name	Date modified	Type	Size
Backup_20180515_1432.pfi	15/05/2018 14:43	PFI File	35,520 KB
hdd-0.pvhd	15/05/2018 14:43	PVHD File	2,912 KB
hdd-0_e00.p01	15/05/2018 14:41	P01 File	4,095,740 KB
hdd-0_e00.p02	15/05/2018 14:42	P02 File	4,095,580 KB
hdd-0_e00.p03	15/05/2018 14:43	P03 File	4,095,576 KB
hdd-0_e00.p04	15/05/2018 14:43	P04 File	4,095,676 KB
hdd-0_e00.p05	15/05/2018 14:43	P05 File	4,095,764 KB
hdd-0_e00.p06	15/05/2018 14:43	P06 File	4,095,536 KB
hdd-0_e00.p07	15/05/2018 14:43	P07 File	4,095,988 KB
hdd-0_e00.p08	15/05/2018 14:43	P08 File	4,095,628 KB
hdd-0_e00.p09	15/05/2018 14:43	P09 File	3,234,460 KB
hdd-0_e00.pbe	15/05/2018 14:43	PBE File	4,095,752 KB

You will now have a clone of your server C:\ drive. Keep this carefully, but always ensure you have backups of your additional media and resources over time.

### Restore Using Paragon

Open Paragon Backup & Restore, and select 'Restore backup':



Follow the wizard to:

- select your previous backup from 'My Backups'
- select your source: either a whole object to restore, or more selectively, files and folders
- select where to restore files to
- choose how to restore (this file only or more at once – or create a restore script).

The restore process will commence.

## Paragon Recovery Media Builder

It would be wise in the event of total O/S failure to have a WinPE-based bootable environment on a USB thumb drive or in an ISO file. The Paragon utility is available on the Backup & Recovery 'Home' menu tab > *Recovery Media Builder*. Follow the wizard through to create the kind of bootable media you require. Label the USB and store safely.

## Media SSD Storage

**Note:** from 2019, servers may have internal HGST or NVMe storage rather than SSD storage.

### SSD LED indicators

- Blue: initialising
- Green: standby / ready

7thOEM disks (2016 onwards) flash when active. GTX disks do not.

**In all normal circumstances after apparent failure of a movie drive, it is recommended to return the Delta Media Server to 7thSense Design for full diagnosis.**

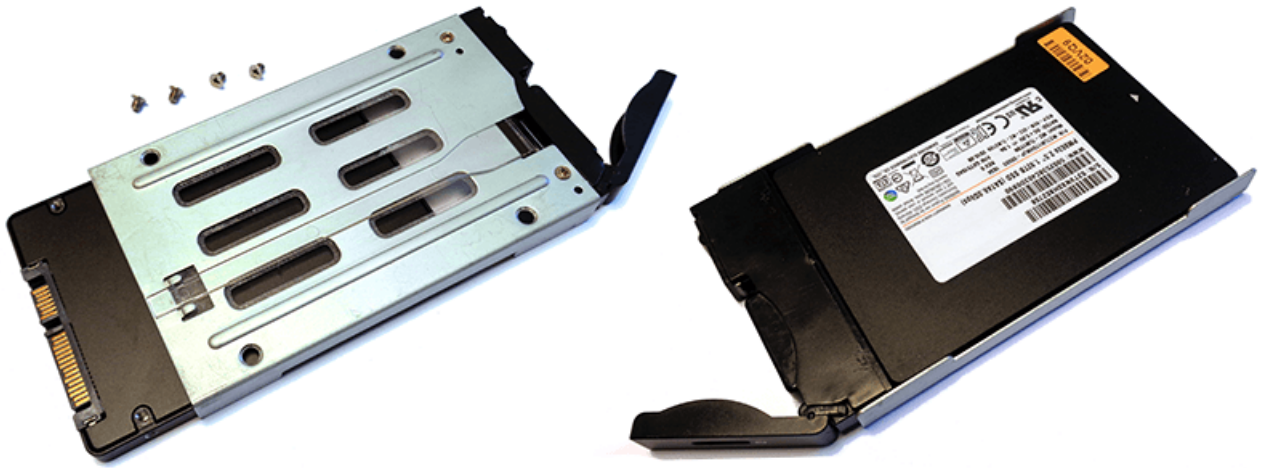
**Approved technical service engineers** may request replacement SSDs or preconfigured RAID0 disk sets.

Delta Media Servers with front panel-accessed SSD media storage have a caddy system. This may be secured by a retaining bar and 2 or 4 screws. Each SSD is additionally secured with a 90-degree, hex-key lock. Please use the key supplied. Illustration: current model Delta Infinity.



In the event of disk failure, SSDs are hot-swappable. However, a disk failure in a RAID0 array will require reconfiguration of the movie drive.

Ensure the show is stopped, remove the retaining bar screws and unlock the required disk to release it. Push up the top catch of the disk (arrowed above) and its sprung handle will drop down. Pull this to withdraw the disk carrier. SSDs are secured to the carrier with four countersunk screws, in each corner. Take care not to damage the clear plastic light tunnel on the back of the carrier.



Replacement is the reverse process. Ensure that the new drive is locked and the retaining bar screwed back in place.

➤ Now [Assign the RAID Disks as Movie Drives](#) <sup>30</sup>.

## Assigning RAID Disks as Movie Drives

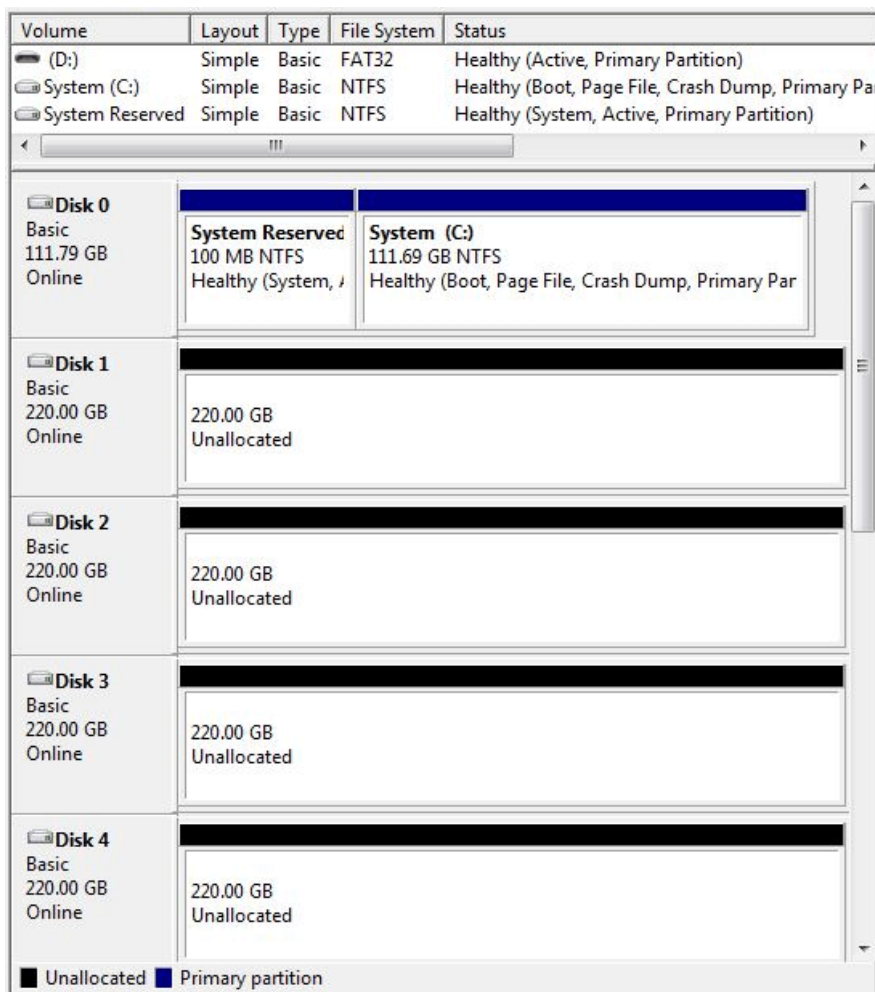
With replacement disks installed, ensure that you have your backup copy of the contents of the Movie drive available.

To simplify this stage, it is recommended you remove all external storage mediums i.e. USB Pen Drives and External HDD disks.

### In Windows

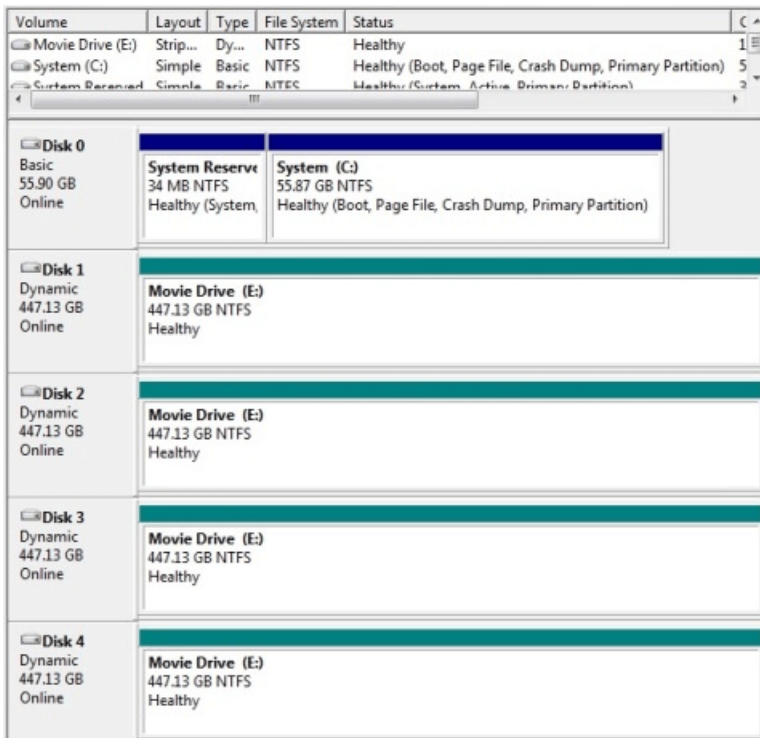
From Windows search, find 'Disk Management': Create and Format Hard Disk partitions.

At the top of the list, disk 0 is usually the C drive, showing a blue bar: this is the drive which contains the operating system used by the server and where images and audio are stored. Below that, with black bars, should be a list of all the drives attached to the server.

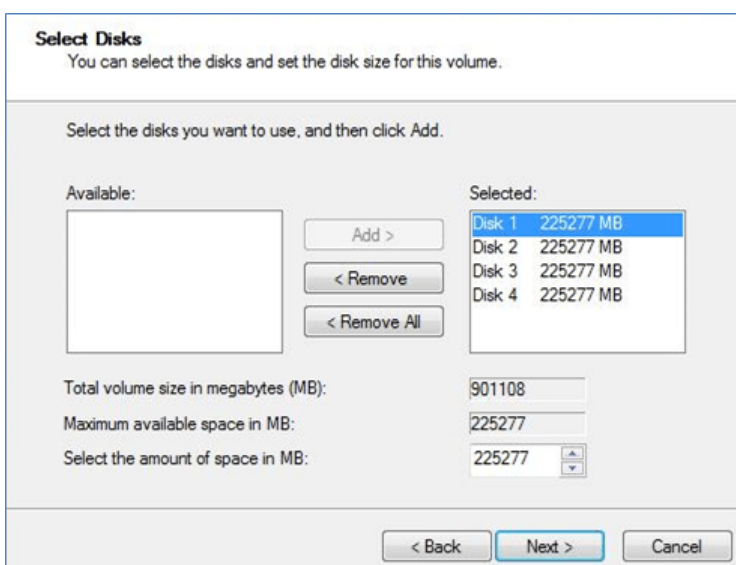


- When replacing SSDs, these may be supplied by 7thSense Design as a **preconfigured** RAID0 movie drive set, and when installed will be recognised as a single 'Foreign' drive.
- Single new SSDs (i.e. **non-preconfigured**) will appear as 'unallocated'.

**For a preconfigured RAID0 set** showing as 'Foreign' (i.e. not 'Unallocated'), right-click the first and select 'Import Foreign Disks'. Click OK to the group, and then to create the striped volume. Wait for this to complete the integration of the disks: they should show as 'Online', 'Healthy' and with a green bar:



**For non-preconfigured SSDs**, these will show as 'Unallocated'. For any SSDs remaining and assumed healthy and working, right-click and 'Delete volume'. This will clear the disk contents, after which they will read 'Unallocated'. Right-click the first unallocated disk and select 'Create Striped Volume'. The wizard will offer available disks to add from those shown as 'Available':



Format the volume, **which must be named Movie Drive**:



**Format Volume**  
To store data on this volume, you must format it first.

Choose whether you want to format this volume, and if so, what settings you want to use.

Do not format this volume

Format this volume with the following settings:

File system:

Allocation unit size:

Volume label:

Perform a quick format

Enable file and folder compression

< Back   Next >   Cancel

Click Next and assign the drive the letter 'E' when prompted. You should then see the RAID0 disk showing as 'Movie Drive (E:)'.

## In DeltaGUI check the drive is assigned

Open DeltaServer and DeltaGUI, and from *Configure > Preferences > Drives*, ensure that E: is listed first in Movie Sources:

Preferences : 'Delta2901' at 10.100.101.227

**Drives**

Static		Size	Free
Images / Audio	C: Windows	111.5 Gb	88.8 Gb

Movie Sources

Drives   Raid7th

Drive	Path	Size	Free	
Drive 1	E: Movie Drive	447.1 Gb	254.2 Gb	Set All
Drive 2	Z: DATA - Raid	1799.9 Gb	665.2 Gb	
Drive 3	Z: DATA - Raid	1799.9 Gb	665.2 Gb	
Drive 4	Z: DATA - Raid	1799.9 Gb	665.2 Gb	
Drive 5	Z: DATA - Raid	1799.9 Gb	665.2 Gb	
Drive 6	Z: DATA - Raid	1799.9 Gb	665.2 Gb	

Reset Missing Disks to C: on Startup

OK   Cancel

Reimport all your required Movie folders and files from backup. To see these as pool resources, click Refresh in DeltaGUI.



➤ Now [Share the Movie Drive](#) <sup>34</sup> .

## Sharing a Movie Drive

---

Sharing **must** be allowed if you require remote access to the movie drive from another PC on the network. After creating or recreating a RAID you will not have a shortcut in C:\7thSense Data to Movies\_E (or in C:\7thSense Data\Additional Folders, any folders to additional movie drives – e.g. Movies\_F, Movies\_G).

### Batch File Method

More recent builds of Delta Media Servers have a convenient batch file that will share all required drives. If so, then you will find a folder C:\7thSense\Software & Drivers\Delta\Utilities\7thSense Data. In here you will have a batch file: \* - 7thSenseData\_v#.bat.

- In Windows Start menu, type cmd, right-click 'Command Prompt' and select 'run as administrator'.
- In the command prompt, go to C:\7thSense\Software & Drivers\Delta\Utilities\7thSense Data
- Copy or type the batch file name and press return.

This will take a few minutes, and the command prompt window will close once complete. All required movie drives will now be shared.

#### CMD prompt help

At C:\> type cd [space], then use tab to cycle through available folders at this level to the one you want. Press return at each level, then cd [space], tab, in turn to progress to:

```
C:\> cd 7thsense
at C:\7thSense>cd "Software & Drivers"
at C:\7thSense\Software & Drivers>cd delta

at C:\7thSense\Software & Drivers\Delta cd utilities
```

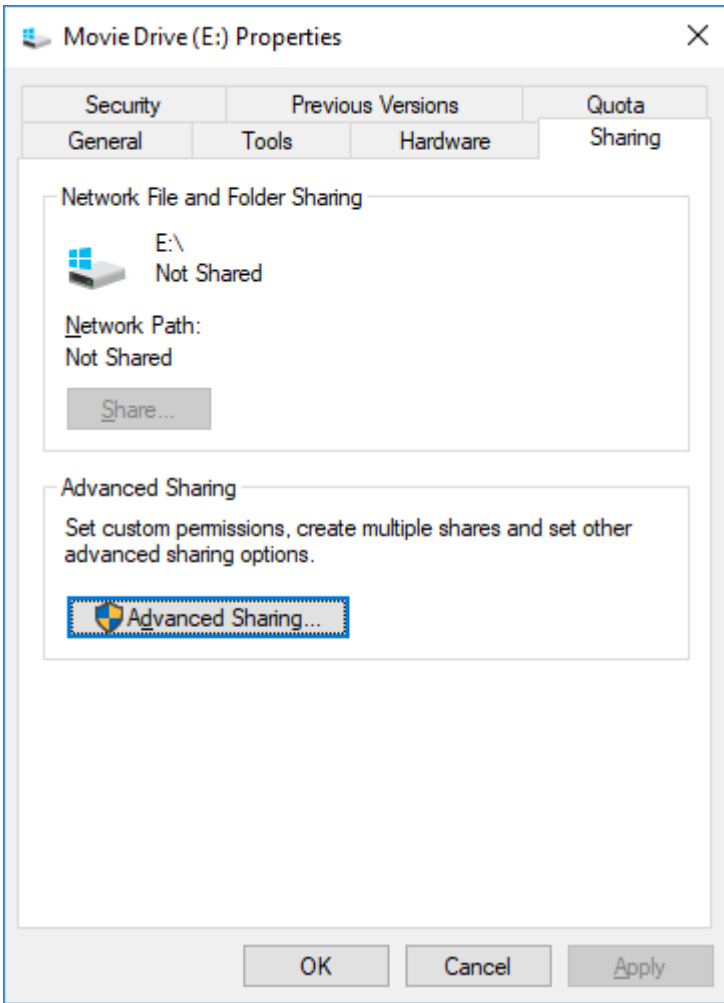
and so on. Or:

You can type the whole path (not the drive), but enclose any folders with spaces in their names, in quotes "7thsense data" (names are not case sensitive):

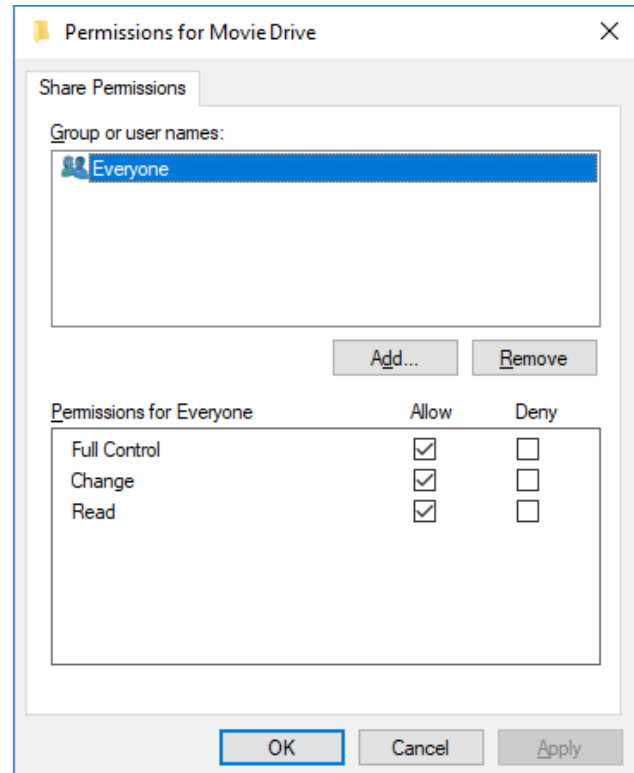
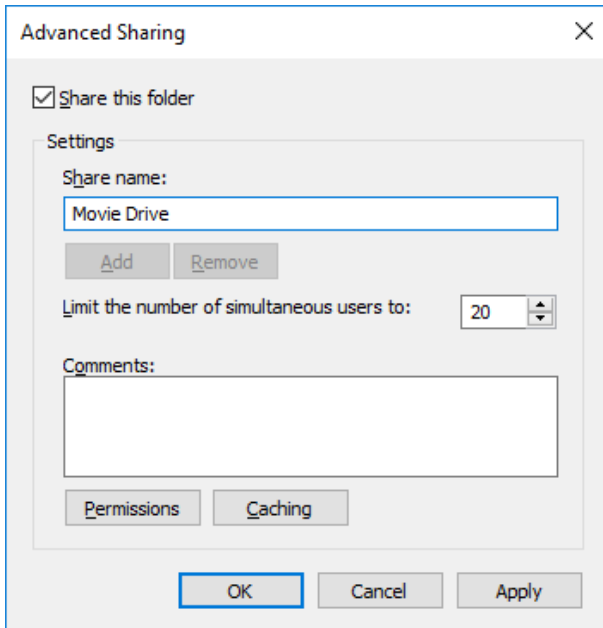
```
C:\>cd 7thSense\ "Software & Drivers" \Delta\Utilities\7thSense Data
```

### Manual Method

**If you do not have the '7thSenseData' batch file**, right-click Drive E: in File Explorer:

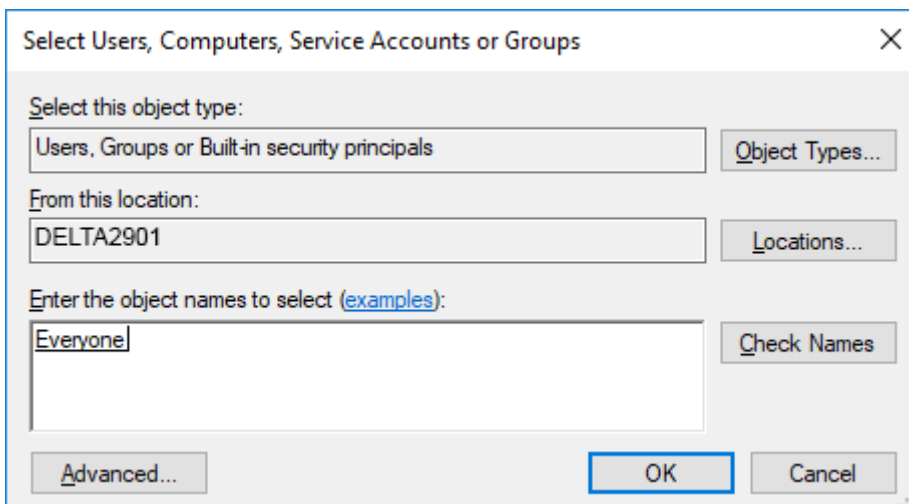


Click 'Advanced Sharing', then 'Share this folder' and in Permissions, allow 'Full Control' for 'Everyone':

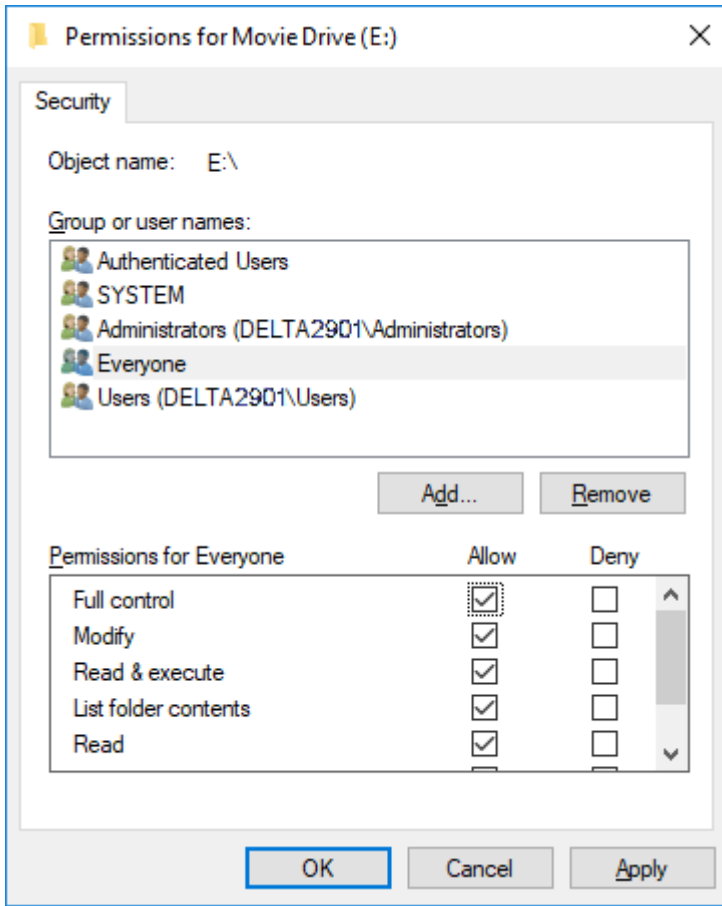


Click 'Apply' then 'OK', to return to the Properties dialog. Now select the **Security** tab, click 'Edit', then 'Add'.

Type in 'Everyone' and then click 'Check Names'.



Click OK to return to the Security tab, and give full control to 'Everyone':



Click 'Apply', then 'OK', and close the properties dialog.

You may want to check, after modifying drive properties, that in *DeltaGUI Configure > Preferences > Drives*, Movie Drive E is the primary location.

If you have additional folders with movie drives, these will need to be shared in the same way.

## Diagnosing a Faulty Media SSD

---

In the event of complete failure, 7thOEM SSDs may not light up, but older SSDs, or partial failure, will not be so easy to identify. We always recommend in the event of a potential disk failure that the server is returned to 7thSense, since between the SSD and the server motherboard there are backplanes, cables and connections any of which may also be a source of malfunction. There are also other causes for a black screen or frame, notably bandwidth restriction. Double-stacking media on the timeline while one fades to another, for example, demands the total bandwidth of all overlapped media for the duration of the overlap, and can be missed as a cause. Movie drive bandwidth is approximately:

1 SSD = 250 MB/s  
2 SSD RAID0 = 500 MB/s  
4 SSD RAID0 = 1000 MB/s  
Up to 16 SSD = 4000 MB/s

Another cause of frame dropout is accidental inclusion of an alpha layer within content. Systems are rarely designed with the bandwidth necessary to play 32 bit (RGA+A) .tga files. Normal or standard .tga would just be 24 bit (RGB).

The Windows Event Viewer will reveal many RAID-related errors if there is a read fault, rather than a bandwidth issue. If there are not, it is unlikely there is a RAID SSD fault.

### There is a RAID SSD fault: which disk?

To identify a faulty SSD element in a RAID array requires the E:\Movies drive to be dissociated back into individual disks. You should already have a backup source for everything on the RAID array (see [Installation Records](#)<sup>59</sup>). If in doubt, and you can still read the E:\ drive, ensure you take a copy to an external storage device via USB 3.0.

### Delete the E:\ drive

From Windows search, find *Computer Management* and go to *Storage > Disk Management*.

Here you will see listed all the SSD disks assigned as (E:). Right click on any one marked (E:) and select 'Delete Volume'.

There will be a warning; confirm you want to delete. The whole Movie drive volume will then be deleted, and the disks will return to 'Unallocated'.

### Sequentially test the SSDs

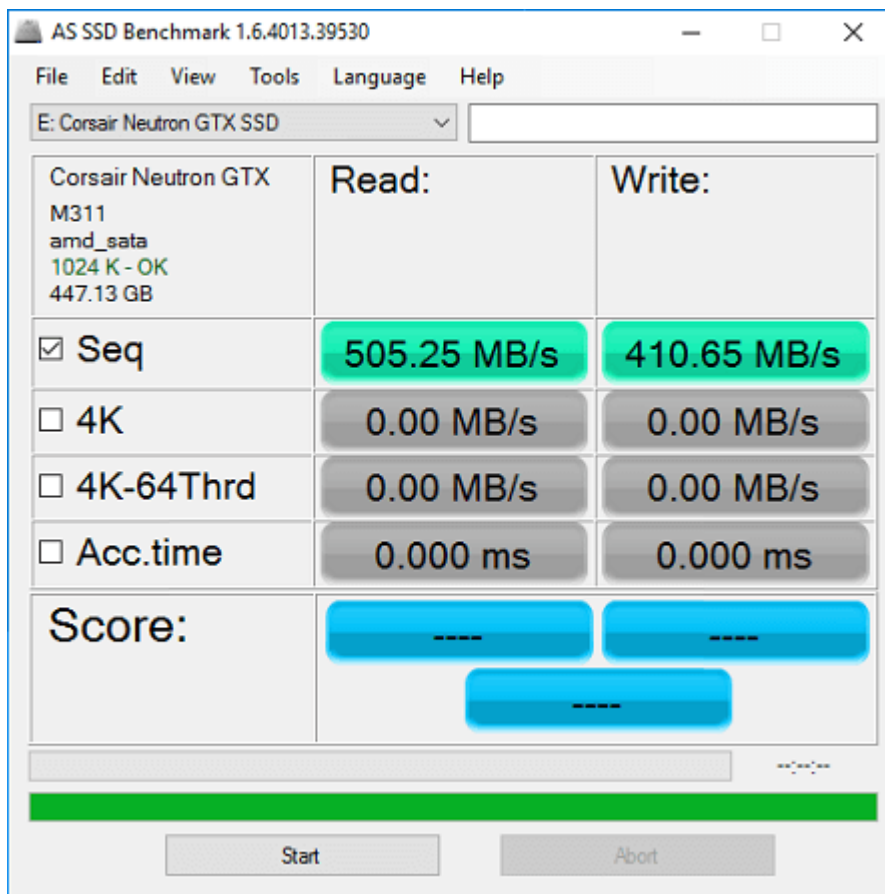
It is easiest to remove all the SSDs (see [Media SSD Storage](#)<sup>28</sup>) and reinsert them one at a time, working left to right. Create each as a simple volume, identifying them in Windows Disk Management

by assigning each a drive letter in turn (E:, F:, G:, etc.) before inserting the next. You will need to be able to identify them in the next test.

Now go to 'C:\7thSense\Software & Drivers\Software\Test Utilities\AS SSD Benchmark' and open the 'AS SSD' application.

Select the first SSD disk, E: (ignore C: drive)

Check the 'Seq' test only, then Start.



Note down the read and write speed for each of the SSDs.

## Identify and remove the faulty SSD

If one SSD is markedly different from the rest, you can identify and replace this disk.

If there is no obvious result, then the SSD problem may only appear when SSD is part of RAID0 set. Identification is now a process of elimination.

Create 2 individual (e.g. 4 out of 8) disk Movie Drives, and name them [e.g. Movie Drive 1 (E), Movie Drive 2 (F)], then do the speed test again with AS SSD.

Take the slower group, split it into 2 groups following the initial process above, always comparing between 2 groups, not with the speeds observed for single disks.

## Recreate the movie drive

Once you have identified and replaced the faulty disk, recreate the movie drive (see [Assigning RAID Disks as Movie Drives](#)<sup>(30)</sup>) and share it.

## Inconclusive test results

The fault in the end may not just be a single SSD, but an internal connection, cable or interface, in which case the server will need to be returned to 7thSense Design for full diagnosis and repair.



## Front Panel Control and Display

In Delta Media Servers (Infinity, Nucleus, Proton, Nano) the front panel display and interaction is controlled by the **DeltaMonitor** application, and can also be accessed via the [Delta Web Service](#).

On Delta 1.5 servers the functionality is limited. Delta 2 added a significant amount of additional functionality. Delta 2.4 saw more software changes to allow for NICs to be modified in all servers (including Nano) without having to enter Service Mode, and with further options for NIC modification throughout. From DeltaMonitor v. 3.0.30 a Konami code was added to lock the front panel controls, and from v.3.0.31, the DeltaGUI connection was added, and warning of licence expiry.




### Terminology

**Embedded Server** – This refers to the Operating system on the server. The embedded servers include: **Nano, Nano4K and Duo II pre-2016**, and **Nano1, Nano2, Nano3, Nano4K in the 2016 and later** server range. (For further information see the [Service Mode](#) Section.)

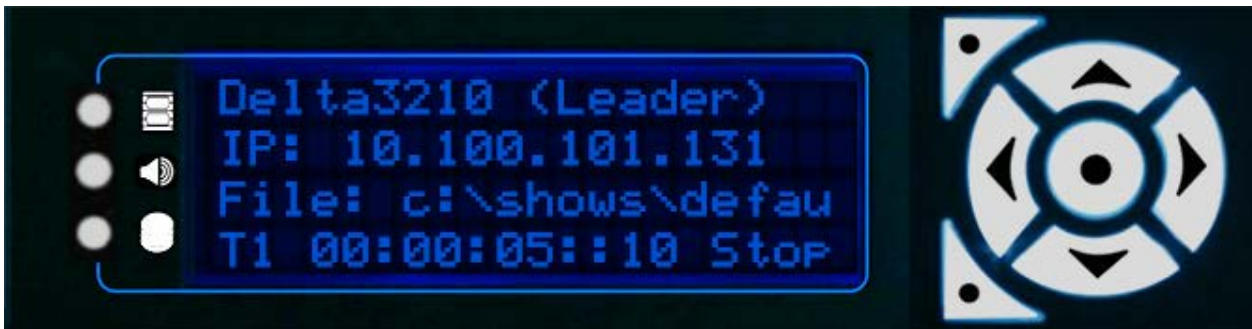
### Pico servers

Pico servers do not share the same front panel controls, and have a single LED indicator on the left:



	Green	The Pico is on and Delta is running.
	Amber	The server is on and Delta is not running.
	Flashing green and amber	Server identification state – the IP has been called externally with a GPIO_ID command (works only when Delta is running). after 15 seconds reverts to green. The <a href="#">DeltaFinder</a> utility operates this mode.

## Panel Features



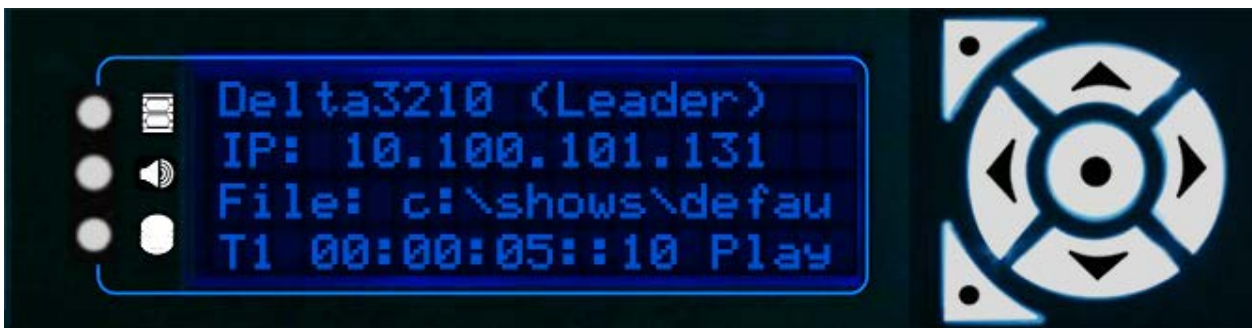
### LED lights

These provide a quick view of graphics, audio and disk status of the server. Note: they will only be 'on' whilst a show is running. Whilst there is no show running, the LEDs will reflect the backlight colour.









### Panel text information

Information is presented as a set of pages providing status information and control of the server. When you switch on the server, it will show basic status information including the server name, Leader/Follower, IP address and details of any show that is running.



These buttons are used to navigate through the pages of information and amend settings where available. The buttons light up for a short while when in use.

- 
top left
used to move forward into a sub-menu or apply a change according to the menu that you are in
- 
bottom left
navigates back to the previous page
- 
left / right
moves between pages; can move the on-screen cursor where appropriate

-  up / down navigation up/down the page that is in view
- 
-  centre equivalent to 'Enter'

### Lock the front panel controls ('Konami' code)

When Delta is running on a server, the front panel controls can be locked from interaction with DeltaMonitor.

From DeltaMonitor v. 3.0.30, a locking code has been introduced. Use this button sequence to disable and re-enable the controls:



[top left], [bottom left], [top left], [bottom left], [centre]

Now, when any button is pressed 'Locked' will be displayed. Re-enter the same code to unlock.




**Please note:** From 2020 7thSense deprecated the terms master and slave for the dependencies between devices. We now refer throughout to 'Leader' and 'Follower' in our products.

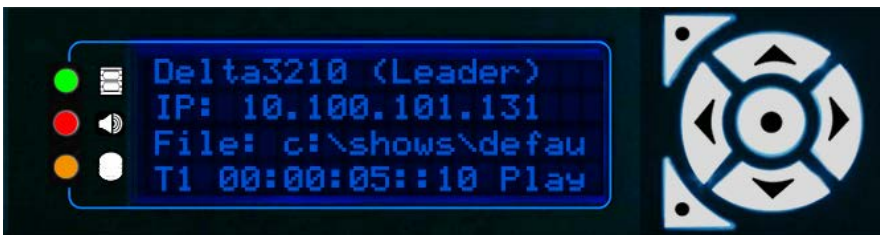
To maintain functionality, both terminologies continue to work internally, but our documentation no longer uses the former terms. Users of pre-2020 products will need to observe the equivalence and continue to use the previous legacy terms.

## LED Status Information

---

The LEDs light up when a show is playing. Colour indicates the status of graphics, audio and playback disks.

-  **Green** OK – performing correctly
-  **Amber** Warning – not running smoothly, e.g. audio time drifting
-  **Red** Error – e.g. dropping frames; needs resolving



### Graphics Status

Indicates whether the server is able to playback at the specified rate. Corresponds with the yellow line on the debug graph.



### Audio Status

Indicates whether audio playback is at the correct rate. Corresponds with the cyan line on the debug graph.



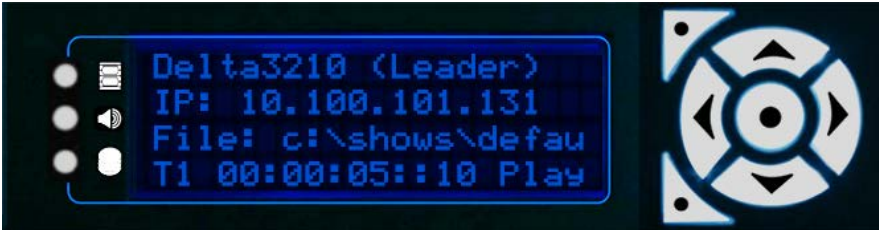
### Disk Status

Indicates whether the server disks are able to playback all movies currently in scope on the timeline.

## Display Text Colours

### Blue

The standard colour of all text on a Delta Leader Server.



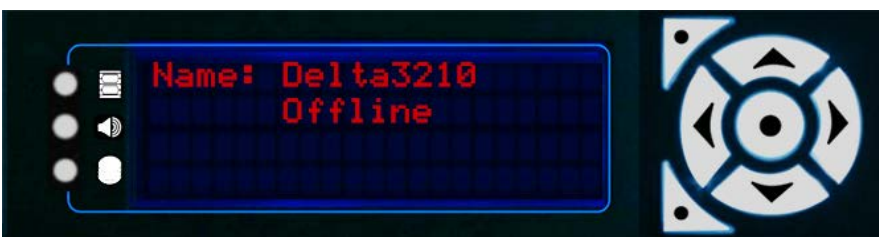
### Cyan

The standard colour of all text on a Delta Follower Server



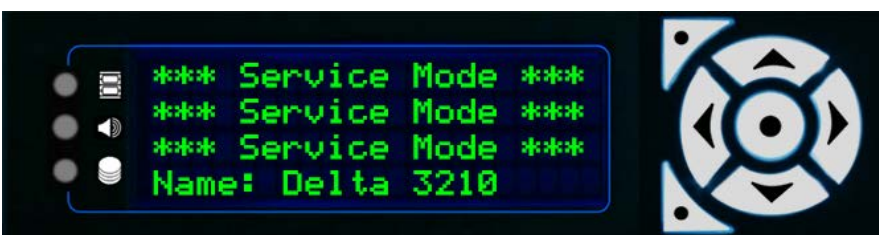
### Red

Indicates the Delta Server application has stopped running. It can also indicate lack of Genlock or AMD grouping if the Delta monitor application has been configured to monitor these states.



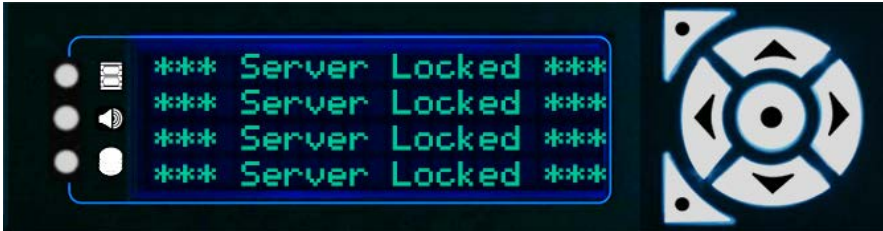
### Green

Indication that the server is in Service Mode. This mode is only available on Embedded Delta Servers.



**Dark Green**

With Windows 10 LTSB, Unified Write Filter (UWF) replaces Service Mode, and is available on all servers using this operating system. When UWF is enabled, the server shows that it is locked:



Note that if the server is a Follower, the colour for this state will be cyan (as shown above). UWF is explained more in the Delta User Guide from version 2.6.

**Others**

Other colours are used for Alert mode. This mode flashes the display on certain actions and is intended to aid programming and debug.

You will see this warning flashing every 30 seconds, if the server Delta licence is expiring within the next 30 days:



The DeltaServer licence has an output bandwidth element. If this is exceeded, there will be a warning displayed in the output, and in DeltaGUI. The server display will show every 30 seconds for 3 seconds:

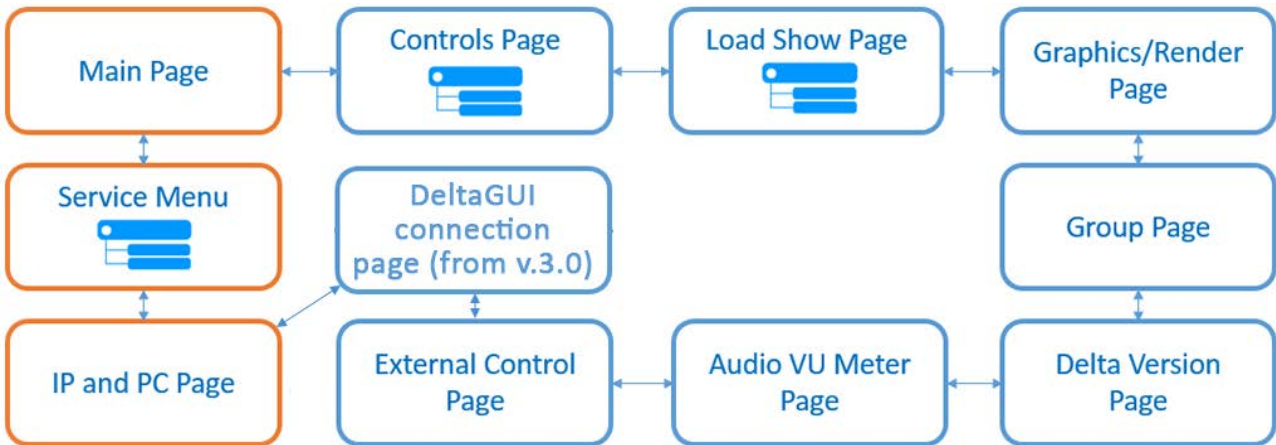




## Menu Structure

The menu structure is navigated using the left and right control keys. The Right Arrow button takes you clockwise around the pages, the Left Arrow takes you anticlockwise.

For example, press the **Right Arrow** button twice to go to the **Load Show** page, or the **Left Arrow** once to go to the **Service Menu**.



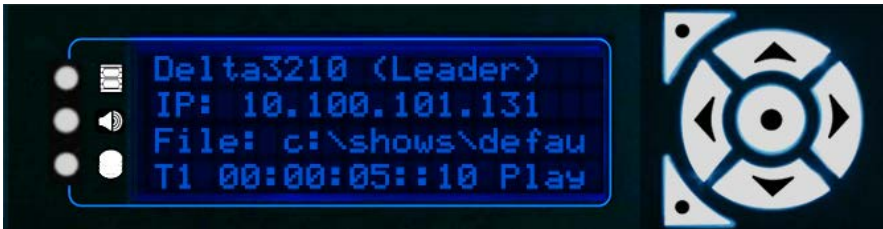
**Note:** Servers running Delta 1.5 are only capable of showing the pages marked with an orange border



Pages with this icon have sub-menus/pages. Press the **Enter** button to open, and the **Up/Down** buttons to navigate. The **Bottom Left** button is the **Back** button.

## Using Delta Front Panel Menus

### Main Display

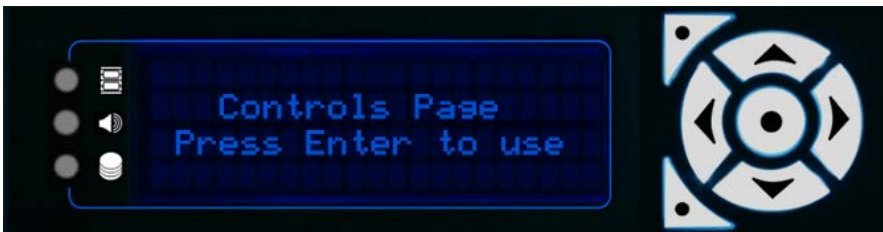


The main display shows the server’s Windows configuration name, its IP address, and the filename of the current show. The last line shows which timeline is running, the position of the playhead and the play status (Play, Stop, Ready).

Press the **Right** or **Left** arrow buttons to navigate to other pages.

### Controls

**Note:** The Controls page is only available to Delta servers configured as a Leader.



Press the Right Arrow button, then Enter (centre button) to use the controls page:



Once in the control page, all buttons have a function:

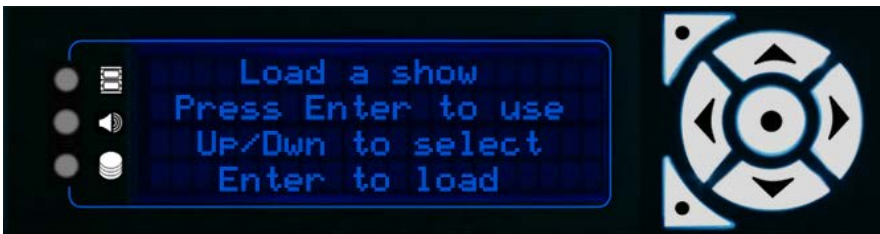
**Bottom Left** Steps back out of the control page into the main pages

**Top Left** Rewinds current timeline to frame 0

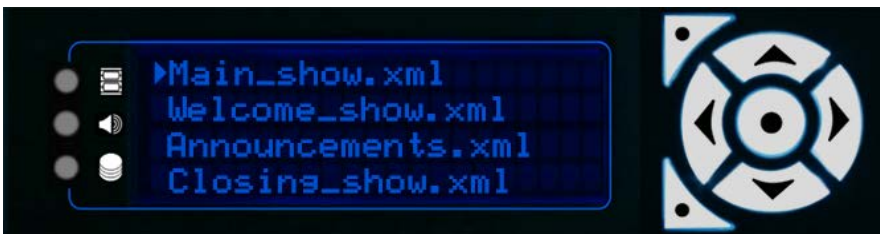


- Left**            Stop playing (if running) and press to step back one frame at a time
- Right**         Stop playing (if running) and press to step forward one frame at a time
- Top**            Play
- Bottom**        Cue, ready to play
- Enter**         Stop

## Load Show



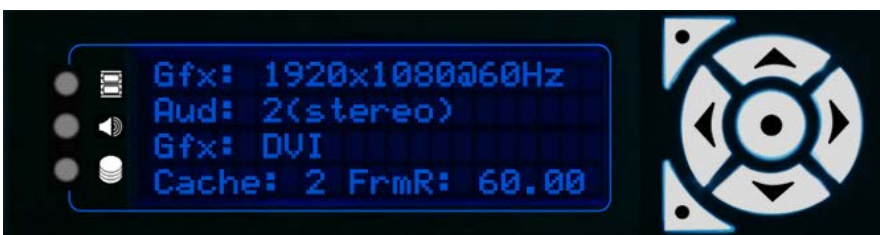
Press Enter (centre button) to list available shows:



The cursor arrow indicates the currently selected show.

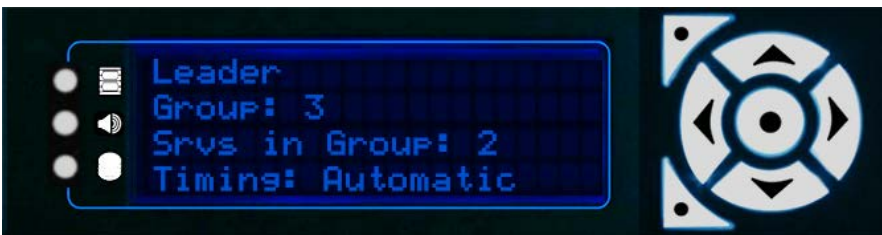
Scroll through items with the Up and Down buttons, and select the one you want with Enter. (Bottom Left button goes back to the Load Show page.)

## Graphics/Render



- Gfx**      Current desktop resolution and refresh
- Aud**      Available Audio
- Gfx**      Available graphics output i.e. DVI, SDI
- Cache**    Current disk cache level

## Group



This page indicates whether the server is a Leader or Follower, the server group it is in, how many servers are in this group, and the current timing mode.

## Delta Version



Shows the current DeltaServer application version installed on the server.

## Audio VU Meter

This page shows the audio playing on the current timeline. If audio is current playing, a VU meter shows, with a vertical line for each channel of audio:



If no audio is currently in scope the display will read 'Silence'.



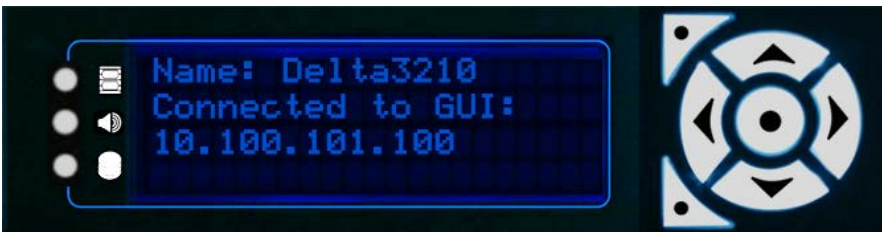
### External Control



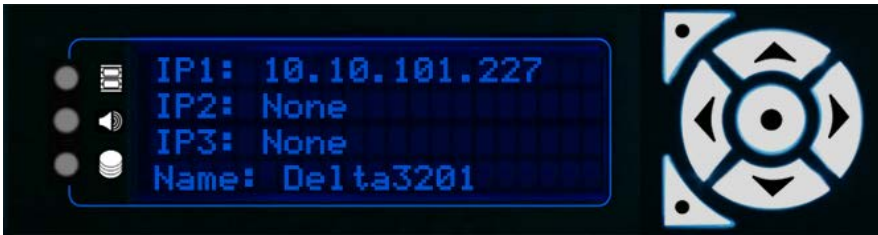
Lists the current TCP and UDP ports for external control, and the last external control message received.

### GUI Connection

From DeltaMonitor 3.0, if an instance of DeltaGUI is connected to this server, this additional page shows its IP:



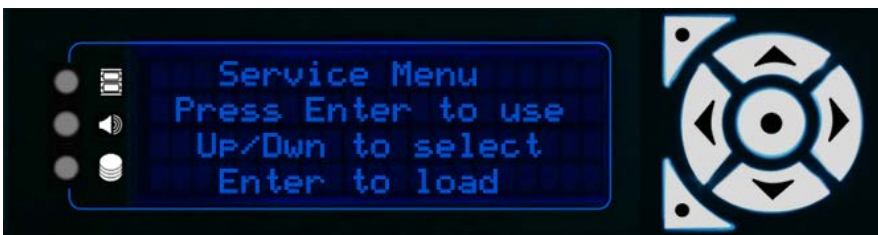
## IP and PC Name



This page shows a list of the current server network IP addresses (first, second and third adapters) and the server's Windows configuration name.

The 's' or 'd' at the end of each line indicates whether the network address is static or dynamic.

## Service Menu



The Service Menu provides configuration functionality for the server. Once in the Service Menu, you will be presented with a list of all the functions available on that Delta server. Move the cursor through the options with the Up and Down buttons and select the required item using Enter.

## Restart Delta



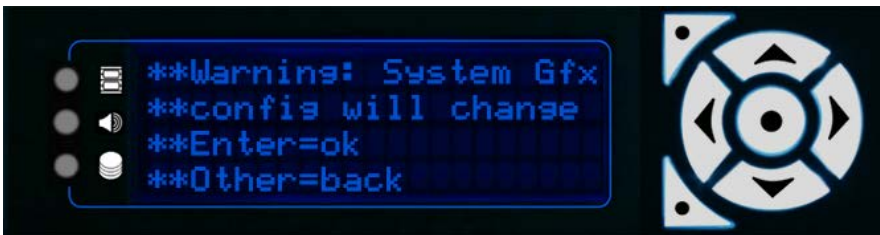
Select restart Delta. Press Enter to restart the Delta server. Confirm twice before the system will restart.



**Reset EDIDs**



Select Reset EDID. Press Enter to delete all forced EDID graphics configurations from the server. Confirm twice before any EDIDs are reset.



**Manage Network**



The Manage Network menu includes: Set DNS; Set Gateway; and Auto IP/DNS/Gateway.

**Note from Delta vs 2.4 and DeltaMonitor 3.0**

Embedded servers no longer need to be in Service Mode to set NIC values. They do, however, still require Service Mode for other tasks such as upgrading the software.

When you enter the Manage Network menu, the display will alternate between IP address and friendly name of the corresponding NIC:



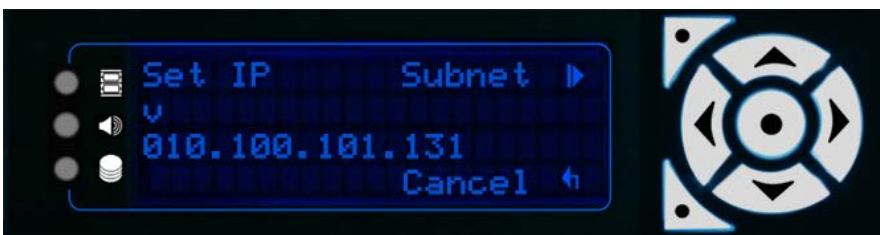


To make changes to the NIC information, press Enter. The Manage Network sub-menu will open.

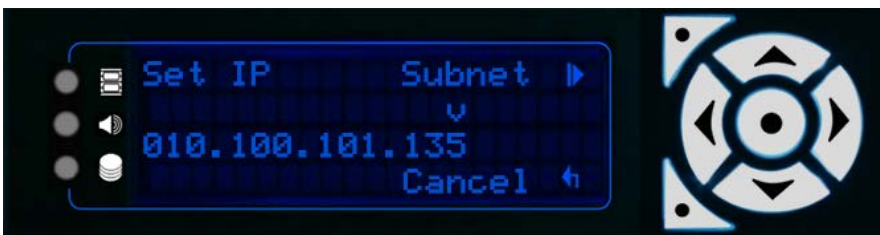


**Note:** DHCP off means that the server is set to a static IP, which is the recommended setting for Delta servers, to allow them to communicate only over the selected network.

Press Enter to open the Set IP option:



Use the left/right buttons to move the cursor along the numbers, and the up/down keys to change the numbers:



Once you have set the IP, you need to open and check/amend the Subnet. Press the top-left button to enter the Subnet screen.

**Note:** 255 fixes that part of the address so that the server will only see other devices on that same network. 000 allows the server to see any other device (numbered 000 to 255) on that network.

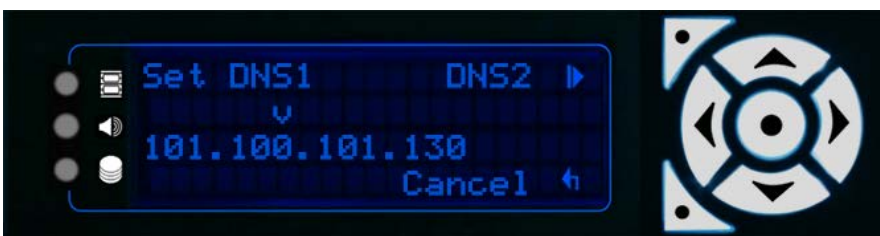


Press the top-left button to Apply any IP and Subnet changes. The system will return to the Manage Network menu.

If your server is using a DNS network, you can set details in this menu:



Select Set DNS and press Enter:



Use the left/right buttons to move the cursor along the numbers, and the up/down keys to change the numbers to a valid DNS. Once set, press the top-left button to check/amend the DNS2 address:



Press the Top Left button to Apply the changes to DNS1 and DNS2 and return to the Manage Network menu.

Note that this option is only available if there is a static IP address.



Select Set Gateway and press Enter:



Use the left/right buttons to move the cursor along the numbers, and the up/down keys to change the numbers to the required Gateway address. Press the Top Left button to Apply.

If you want the server to select an IP automatically, you can switch DHCP on by selecting the Auto/IP/DNS/Gway option:



Press Enter to switch to automatic selection.

**Note:** You may need to use this setting if you want your server to temporarily switch networks to, for example, allow access to the internet. To switch back to a static IP, and switch DHCP off, you should set the IP/DNS/Gateway manually, following the steps above as required.

## Service Mode

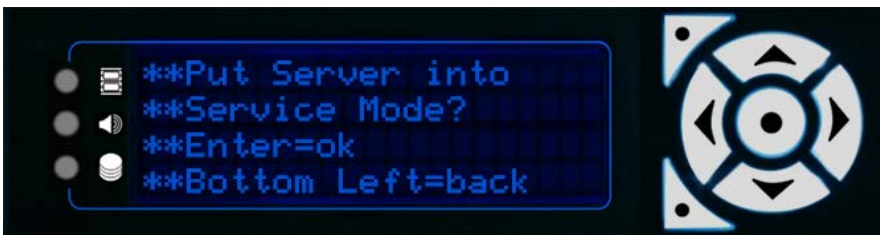
**Note:** Service Mode is only available/required on Embedded Servers. From Delta Monitor v. 3.0 it is no longer necessary to put the server in Service Mode to change NICs.



This function allows you to cycle in and out of service mode on an Embedded Server.



Selection of Service Mode results in the menu below. The Enter key is used to agree to either put the server into or out of Service Mode. You will be warned twice before the system does the restart.



All Nano, Nano 4k and Duo II servers use a Windows Embedded Operating System. This offers the advantage of file write protection on loss of power.

By default, all embedded servers are shipped out of service mode. When an embedded server is not in service mode its menu is Blue/Cyan as per any normal Delta server.

When not in service mode, the operating system disk is locked. Anything that is saved to the OS disks when not in service mode, will be lost on reboot.

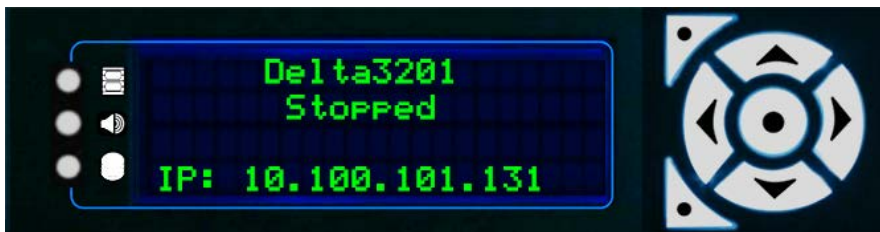
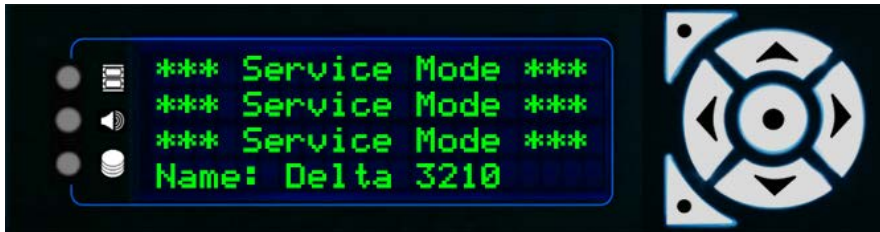
There are some exceptions to this rule which are the following:

- Delta registry settings, including any changes made to preferences within Delta through Delta GUI, will hold after a reboot.
- The Delta/System area is read/write
- All major media locations on the OS disks such as:

C:\7thSense  
 C:\Audio  
 C:\Blends  
 C:\Colour  
 C:\Geometry  
 C:\Images  
 C:\Meshes  
 C:\Sequences  
 C:\Shows  
 C:\Splines  
 C:\Text

When in Service Mode, the server OS disk is completely open and writeable with full Administrator access. If you have a need to install drivers or additional software, you need to be in service mode to do this.

In this mode the Front Panel text is permanently green and rotates flashing the Service Mode text below.



**It is not advised to leave the server in service mode during normal operation.**

**Once you have made any required changes to the server you should always switch back out of Service mode to Normal mode.**

## Installation Records

---

By the time your server system/network has been fully configured and made operational, you will have added a lot of media, configuration resources, set IP addresses and perhaps assembled a fully populated and cabled rack. Protect this investment by:

- keeping clear and complete records of installations, any additional drivers or software and their versions
- creating a map of your total system and how it is connected, including all IP addresses
- labelling all your cables, perhaps with photos of rear panel connections – the positions of plug connections for audio, capture and network ports are important
- creating a clone or backup of your whole C:\ drive on external storage
- ensuring you have copies of all your media – not just original files received from content creator, but all final converted 7th files, particularly if complex carving has been done.

7thSense has a complete record of your system as it was delivered, but your own records thereafter will be essential in the event of any malfunction.

## Warranty, Support and Service

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Standard warranty is 24 months, return-to-distributor. Please contact 7thSense Design if you require an extended warranty.

Please ask for instructions and request authorisation before returning a server to your distributor.

### Server Internal Maintenance

Internal maintenance must only be undertaken by suitable qualified service personnel.



**Warning:** Do not operate the server with any covers removed as the air flow through the unit may be compromised leading to overheating. The lid of the NanoR forms an integral part of the CPU's cooling circuit. Operation of the NanoR with the lid removed will cause the CPU to overheat.



**Warning:** Motherboard CMOS battery replacement: Danger of explosion if incorrect battery used or battery incorrectly installed. Contact your supplier for further instructions.

Any alterations to the product's specification, including additional/alternative components, BIOS changes, overclocking, etc., may invalidate the warranty or impact the server's performance. Additionally, such changes or modifications could cause equipment no longer to comply with the relevant EMC regulations, and void the user's authority to operate the equipment. If in doubt, please contact your supplier.

### Electrostatic discharge (ESD)

When handling electronic assemblies, take precautions to avoid electrostatic discharge (ESD) causing damage. Precautions should include the wearing of an ESD protective wrist strap and using antistatic bags for electronic assemblies when not installed in a server.

➤ Visit our Support Portal for [support and service](#)

## Regulatory Compliance

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### FCC

Delta Media Servers comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

**Note:** The equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this user guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

### European Union, UK

Delta Media Servers are a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

### End of Service Life



Dispose of the equipment and any components in accordance with all local and national safety and environmental requirements.

## Document Information

Date	Document edition	Software version	Revision Details	Author/Editor
October 2017	1	N/A	New release	Andie Davidson
May 2018	2	N/A	Replacing O/S drive explained; keeping system records.	Andie Davidson
August 2018	3	N/A	Minor advisory edits; clarification of rear panel audio	Andie Davidson
May 2019	4	N/A	Inclusion of Pico servers and Front Panel locking	Andie Davidson
August 2019	5	N/A	24-month warranty added	Andie Davidson
April 2020	6	N/A	GPIO pin ID clarified	Andie Davidson
June 2020	7	N/A	Pico opto-isolated GPIO added	Andie Davidson
July 2020	8	N/A	Updated for Infinity SAGE motherboard rear panel	Andie Davidson
July 2020	9	N/A	Revised server terminology	Andie Davidson
April 2022	10	N/A	Minor edits to page links.	Andie Davidson
November 2022	11	N/A	Infinity 2021g illustration added. Update to Pico GPIO capabilities.	Andie Davidson

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