



Delta Media Server

Dome Mode Autoalignment

User Guide



Dome Mode Autoalignment : User Guide

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Autoalignment Process: Preparation

Autoalignment Calibration Data

7thSense recommends Display Manager™ from Scalable Display Technologies for automatic geometric alignment of displays with Delta Media Server. This is a camera feedback system, whereby light and patterns projected by the alignment software are 'read' by a DSLR camera to produce alignment calibration data. This is fed back to the Delta software to project a perfectly calibrated display.

Each Delta server loads the autoalignment data in its directory for Scalable Display autoalignment systems. The default output folder used by the Scalable Display Client is C:\Program Files\Scalable Display\DEI\LocalCalibration.

➤ see [Scalable Display Manager](#) ⁽⁷⁾

Systems that can export MPCDI standard exchange files can also be used (for example VIOSO), and these files are copied directly into C:\AutoAlignment\MPCDI on the server. See:

➤ [Using MPCDI Data](#) ⁽¹⁵⁾

➤ [Using VIOSO with Delta](#)

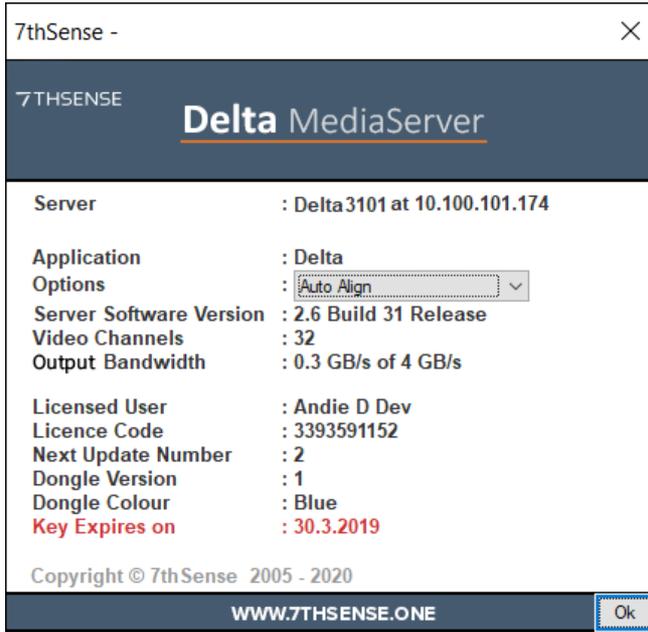
Media

Full dome displays usually use fisheye media (square or dome-master format) and typically involve 6 or more projectors. It is important to have sufficient overlap to achieve good blends, and to position projectors for good overall focus and avoiding large incident angles.

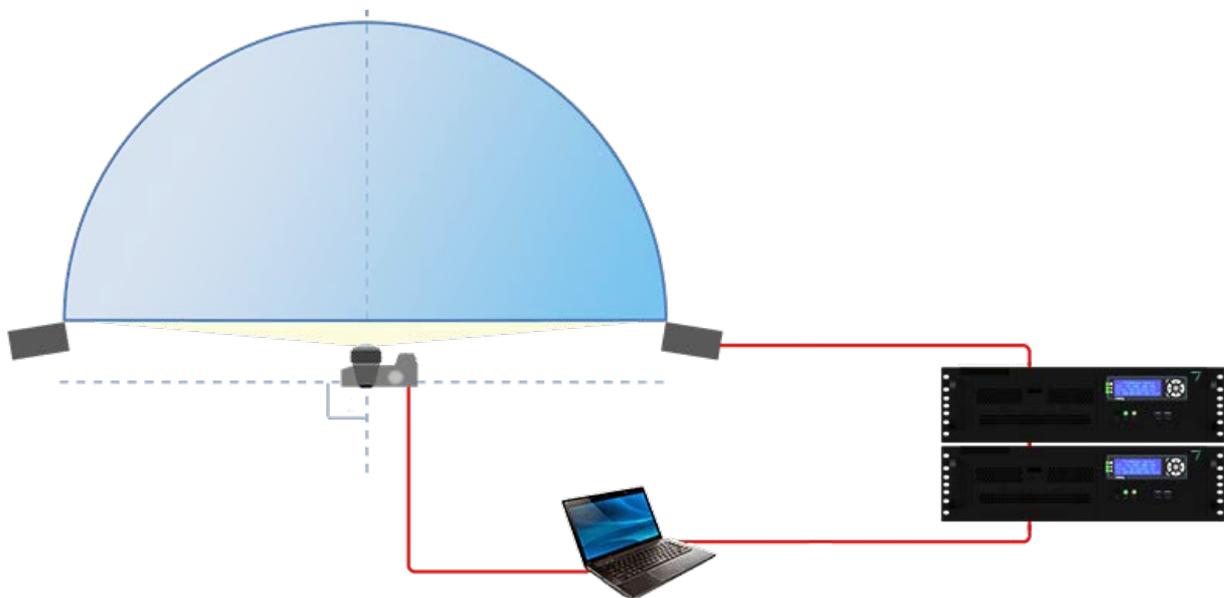
System Setup for Scalable Display Manager

It is assumed that:

- the graphics card setup has been done (AMD: Grouping; NVIDIA: Mosaic)
- Scalable Display Manager, as client, has been already installed by 7thSense on each Delta server being used for the display
- Scalable Display Manager (licensed installation) is installed on a separate laptop PC, on the same network as the server(s).
- DeltaServer has a current Auto Align licence, and Dome Mode licence. Check the 'About' dialog on DeltaServer. You should see Auto Align in the dropdown list of options:

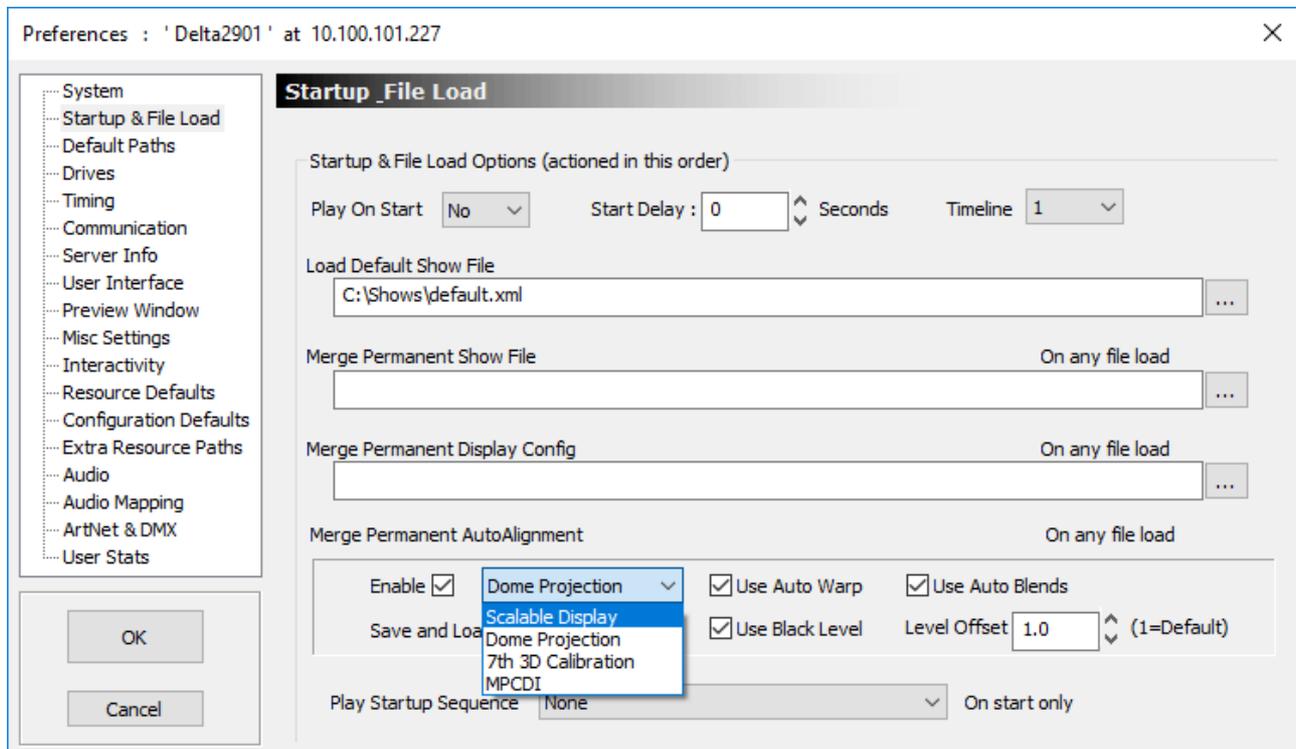


- DeltaGUI *Configure* > *Preferences* > *Startup & File Load* has AutoAlignment, Use Auto Warp, and Use Auto Blend enabled.
- In the diagram below, a Scalable Displays-recommended camera has been set up, with a fisheye lens, facing normal to the pole of the dome, close to the dome spring line, and can see the whole display – but as little more as possible. Unwanted light should be minimised to achieve best contrast for the Scalable software, and kept constant. This camera is connected to the laptop PC using Display Manager.



Configuring Delta to use Autoalignment Data

To enable use of autoalignment data within Delta go to DeltaGUI: *View > Preferences > Startup_File Load*:



In the *Merge Permanent AutoAlignment* section:

- Select *Enable*
- Select the autoalignment system being used (e.g. [Scalable Display Manager](#)⁽⁷⁾ or [MPCDI](#)⁽¹⁵⁾).
- Select whether you want to use *Auto Warp*, *Auto Blends* and *Black Level* options (as available to your autoalignment system type: *Black Level* is currently only available with *Dome Projection* and *MPCDI* systems).
- Click *OK* to accept changes: Delta will import and use the data.
- Delta automatically applies warp, blend and black (as available) when autoalignment is enabled.

Manual Geometry and Blend can be added as normal on top of any autoalignment data.

Scalable Display Manager

Please consult the Scalable Display Manager User Manual for full details. This is our summary procedure for use with Dome display in Delta.

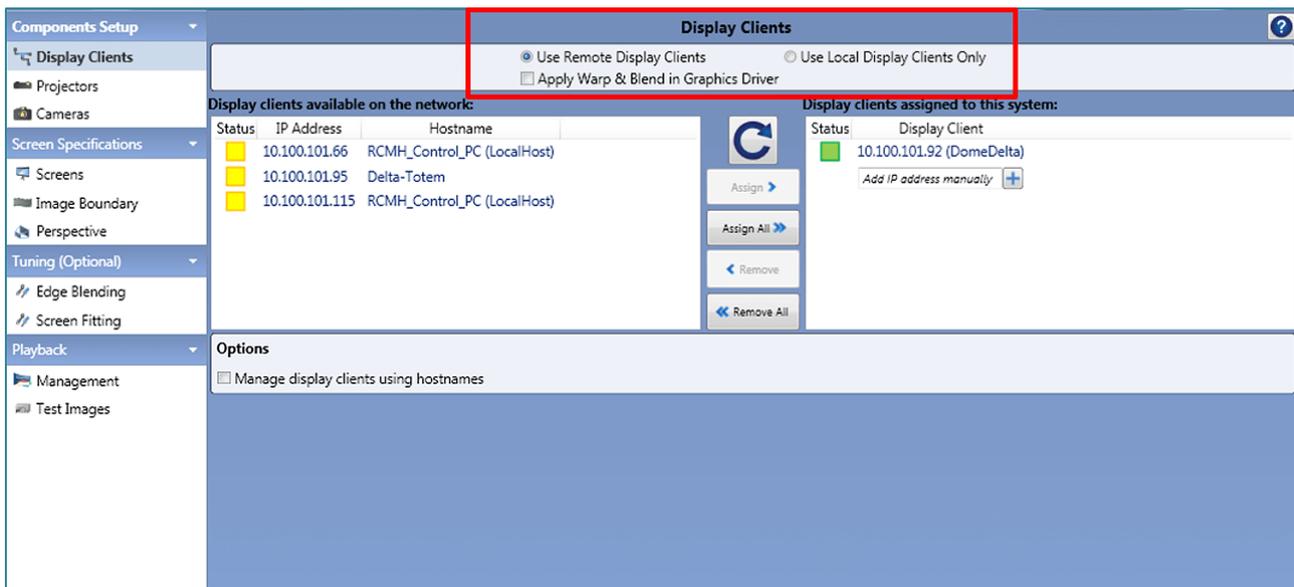
Follow these steps in sequence to create the autoalignment calibration data that Delta requires from Scalable Display Manager.

    First check (bottom left of the Display Manager screen) that the camera is connected.

1. Display Clients Tab

Select **Use Remote Display Clients**, then find and connect to every display client server.

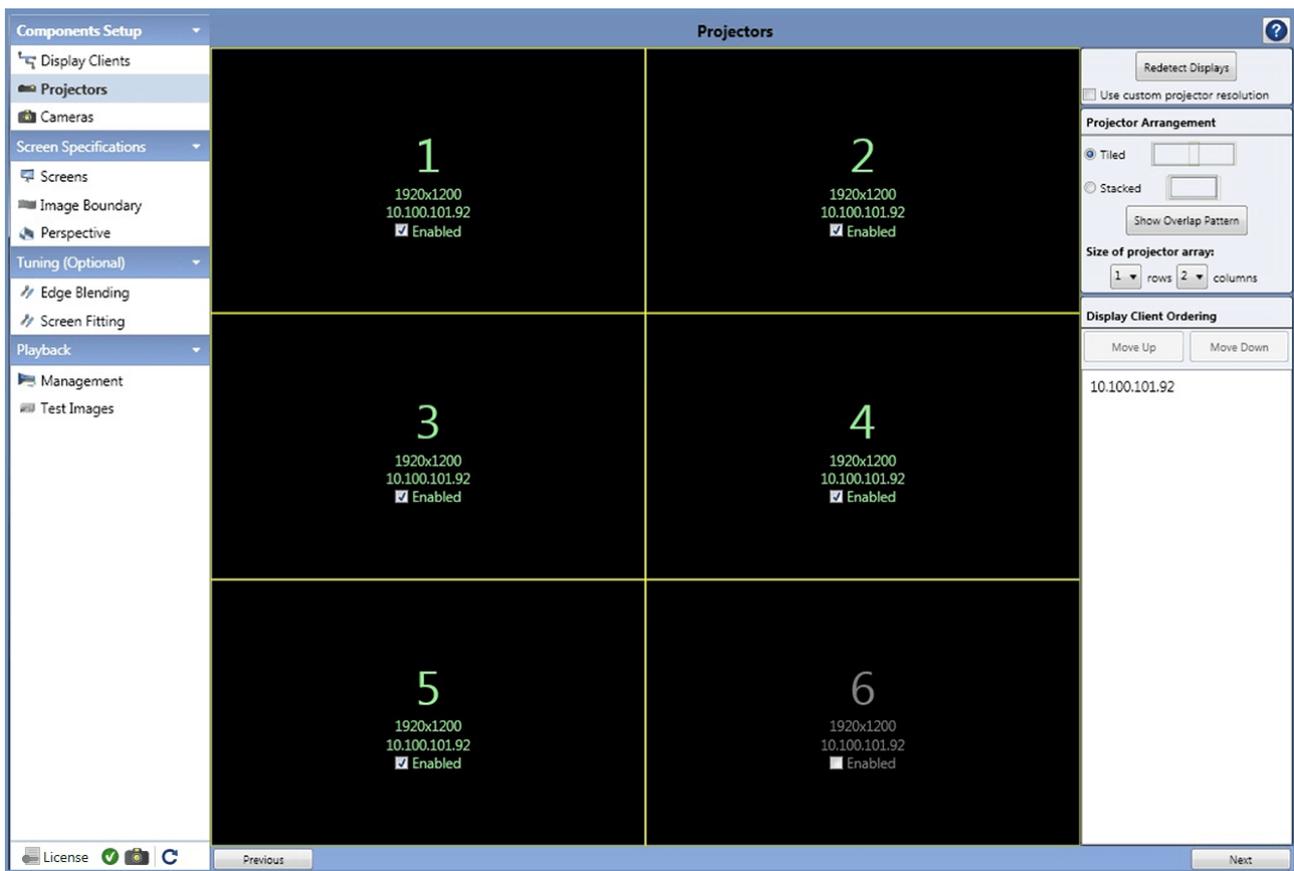
Assign the IP address of the Delta server to the right-hand column. If it does not appear, try restarting the SDT Display Client on the host PC. This can be found in the Start Menu.



2. Projectors Tab

Make sure the correct number of projectors appear and at the correct resolution. If you set a specific Matrix Mode array in Delta, you should have the same configuration here.

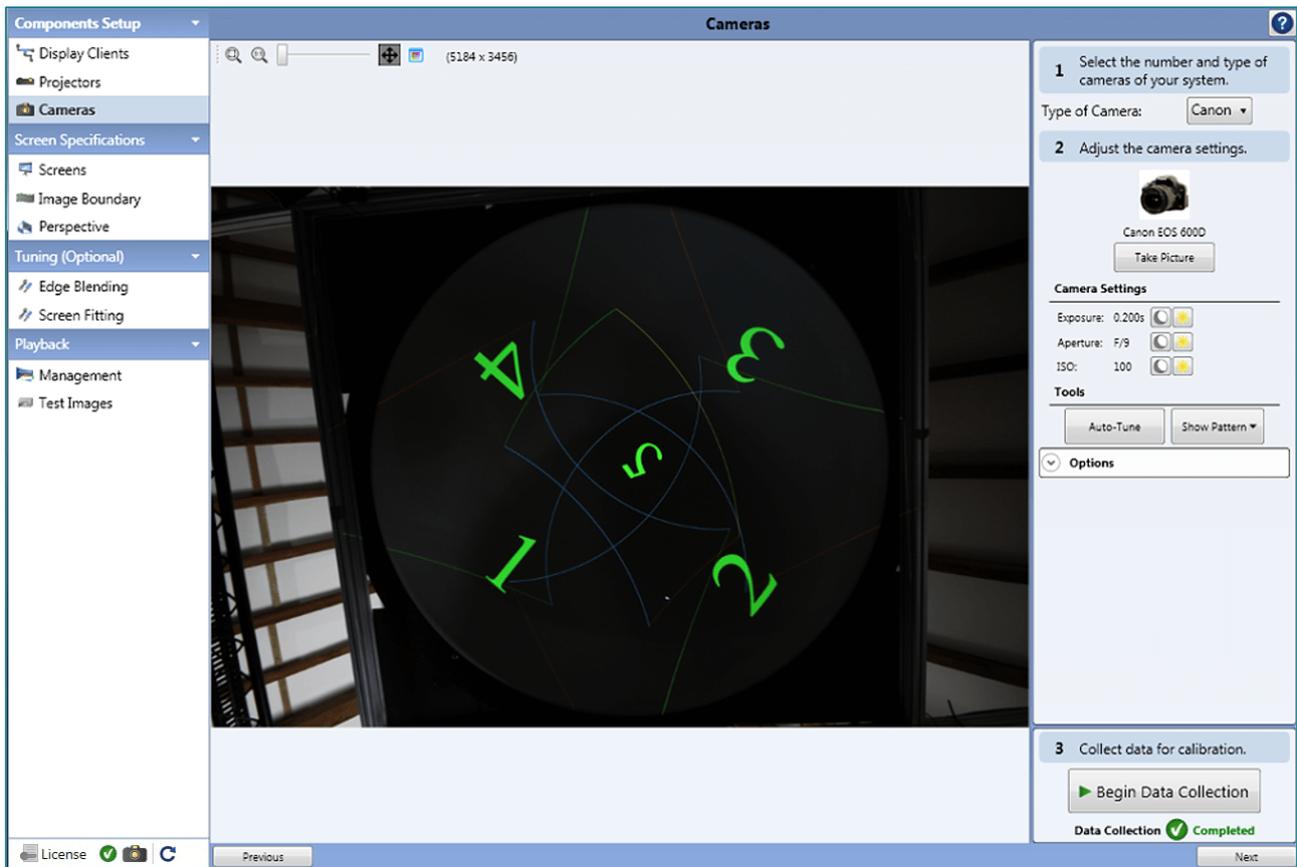
- It is important to disable any unused displays here.
- It is best to make this configuration match your DeltaServer desktop configuration. If it is not automatically correct, use the custom resolution option and number of rows and columns to make sure the layout matches Delta.



Click 'Next'.

3. Cameras Tab

- Position the camera normal to the pole of the dome (see [Preparation](#)⁽⁴⁾), and make sure the entire screen image is in view and is not over-saturated.
 - The orientation of the base of the camera will determine where North (0 degrees) is.
 - The centre axis of the lens will determine where the pole is.
- Use the 'Show Pattern' button to put up sample grids to help ensure all the spots are visible.
- 'Auto-Tune' can be used for correct exposure, and is often necessary for large displays. It's worth trying without first, as the process is quite robust. If you can get away with the default short exposure time, the alignment can be a lot quicker.
- Project a pattern or static image that has contrasting edges to facilitate focusing, and take a picture with the camera in auto shot and auto focus mode.
- Clear the image and switch the camera to manual shot and manual focus mode.



Click 'Next'.

4. Collect Data



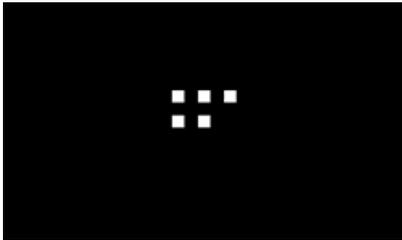
Check the camera has not gone into sleep mode and press Begin Data Collection.

The Scalable software will project a series of calibration images:



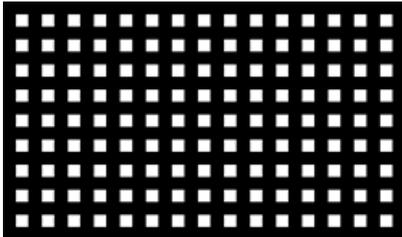
White

Used to see the area of a channel, and to auto detect the image boundary.



5-dots

Used to determine orientation and location of a channel.



Grid pattern

Used to measure the screen geometry of the channel.

No more images will be taken by the camera unless a new data collection process is required.

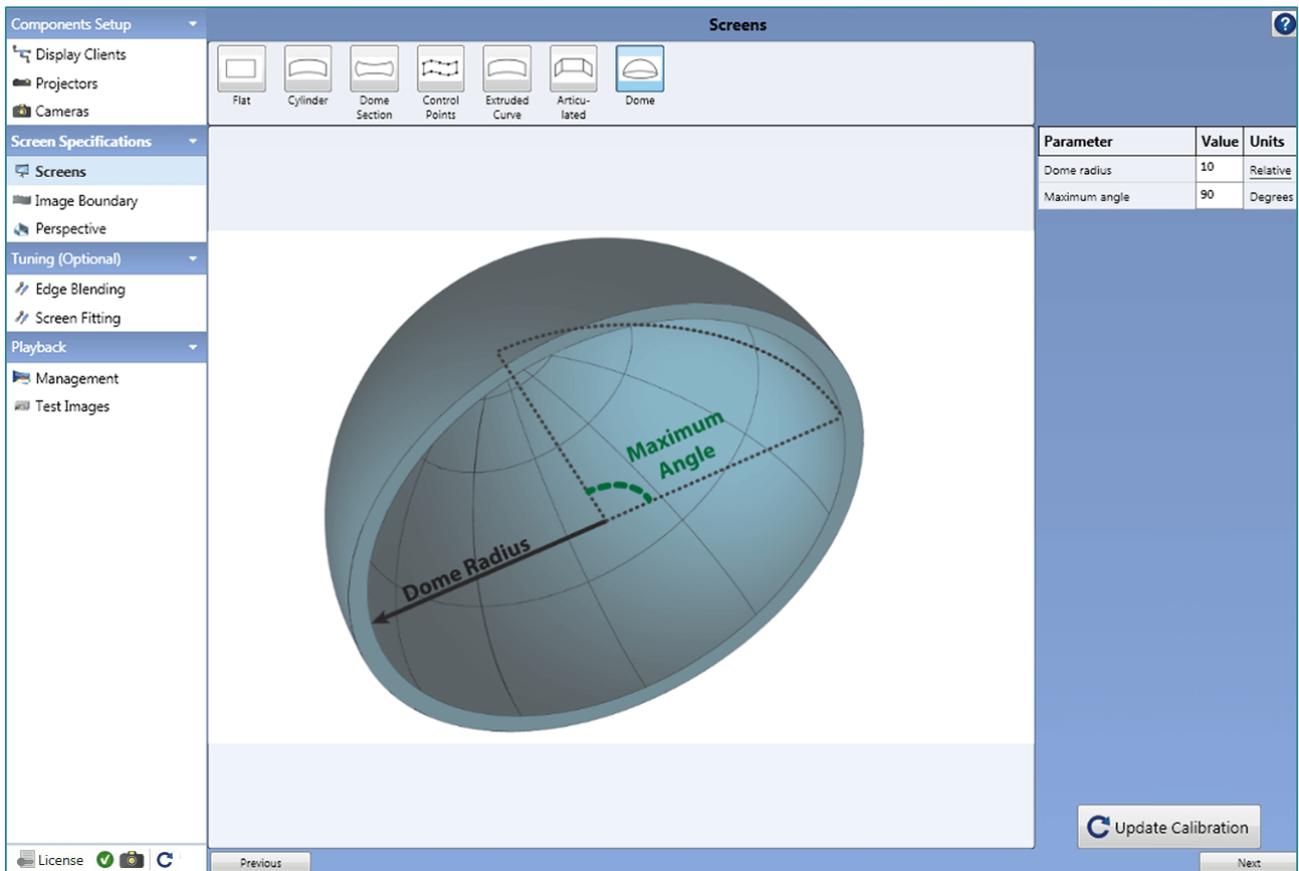
5. Screens Tab

Dome

The Dome screen type. There is no need to change any of the settings so leave them at their defaults of 10 and 90.

All other types

Select the screen shape you have and enter the appropriate metrics for the screen:



If you make changes, click 'Update Calibration'.

Click 'Next'.

6. Image Boundary Tab

Dome

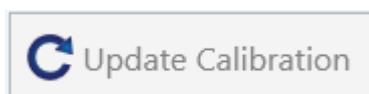
It is not necessary to set boundary points here, although you have the option to if necessary. Otherwise use auto detection, and check that the displayed image covers the desired area.

All other modes

Set boundary points of the screen here.

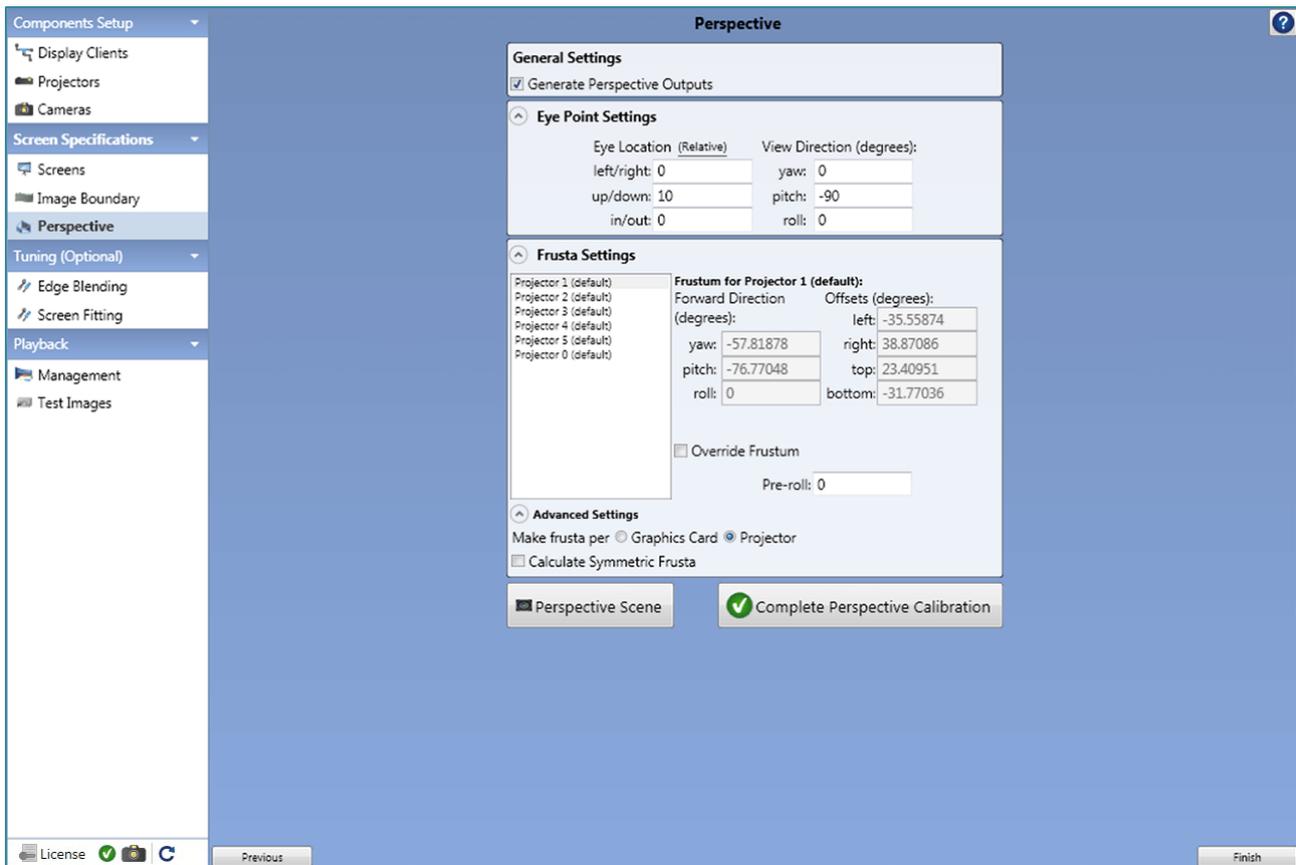
Click 'Next'.

7. Update Calibration



Modify the previously collected data with the new parameters by pressing Update Calibration. You will now need to make an adjustment to perspective that will not affect the calibration.

8. Perspective Tab

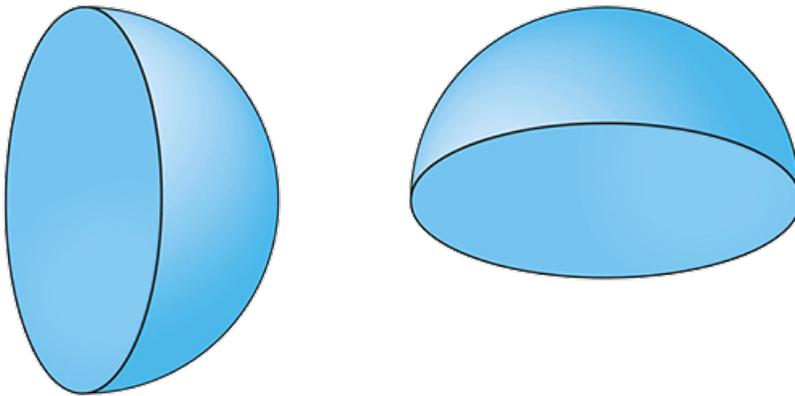


In the *Frusta Settings* > *Advanced Setting* area, towards the bottom of the panel:

- select 'Make Frusta per' **Projector**.

In Eye-Point Settings:

- set the **up/down** eye-point number. This is a representational number for the depth of the dome (= radius, for a full hemisphere) with a default of 10. This should match the screen radius setting in Delta, dome display configuration.
- set the **Pitch** value. The Scalable default views the dome as in front. For an overhead dome, rotate the pitch up by -90 degrees.



The pitch rotation could be set within Delta rather than Scalable but to avoid confusion, it is better to have the display represented correctly within DeltaGUI.



Click 'Complete Perspective Calibration', and then 'Finish'.



Once the final calibrated image is shown, clear the dome of images. Either click 'Hide Display Clients' in the Management tab, or close the Scalable Display Manager.

Note: The image shown as the final image onscreen by Scalable Display Manager may look as though it does not fill the entire screen. This is normal—it can still be fine within Delta.

8. Calibration or Recalibration?

The Scalable Display Manager alignment data apply to the relationship between the projectors and the dome. If the projectors have not moved and the camera position is unchanged, then changing input parameters only requires an update. If any projector has been moved, a full recalibration based on new camera images will be required.

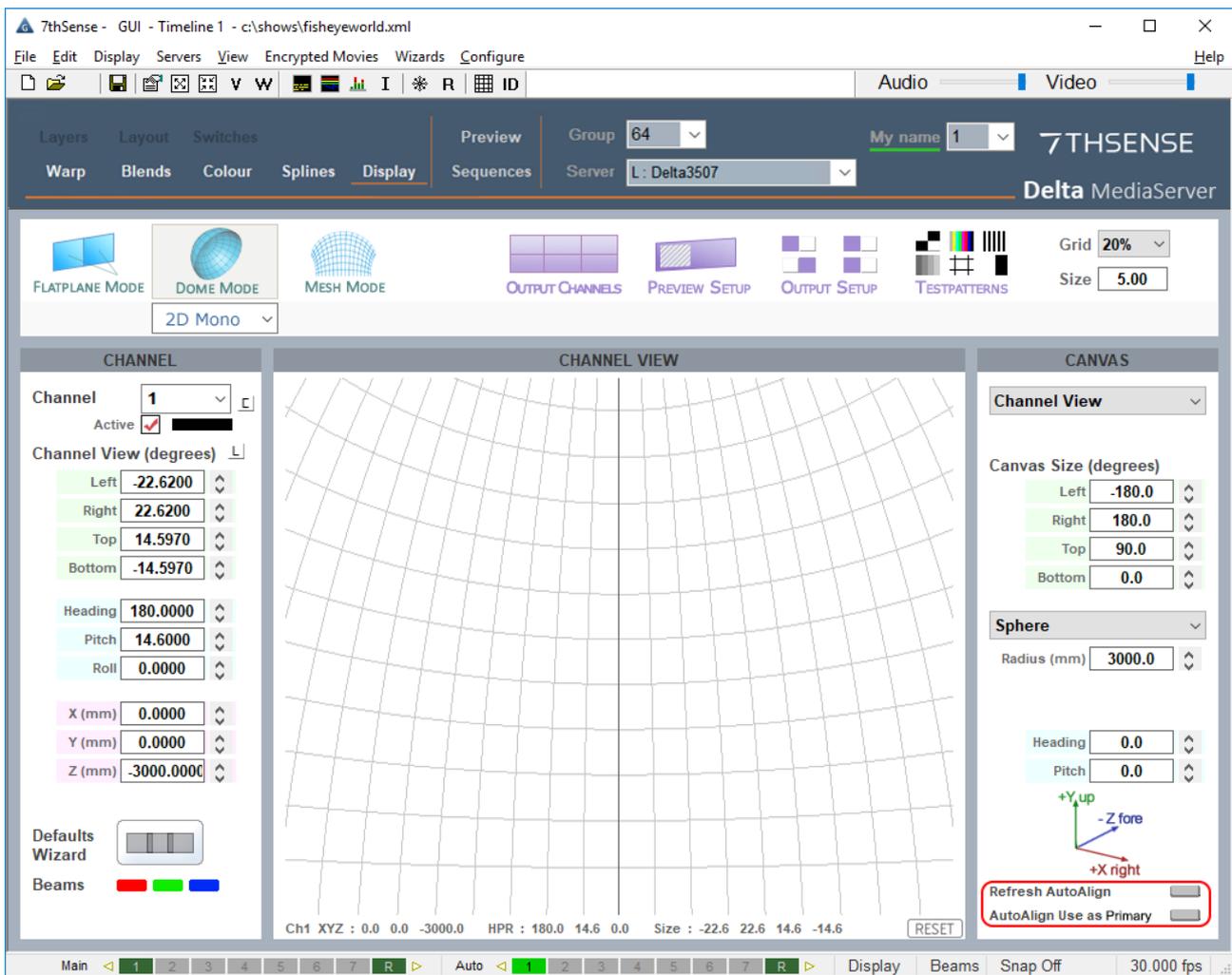


Recalibration can also be run from the Scalable Display desktop icon.

Import Autoalignment Data into Delta

The 'Refresh AutoAlign' button is available in either Flatplane or Dome Mode when autoalignment is enabled in the configuration startup preferences. Click it at any time to re-import the Scalable Display autoalignment calibration data.

The Scalable autoalignment data can be copied from C:\Program Files\Scalable Display\DEI\LocalCalibration into the C:\AutoAlignment\Scalable Display folder to be used on startup: click 'AutoAlign Use as Primary'. Whenever there is alignment data in this folder, it will be used in preference to new Display Manager calibration data.

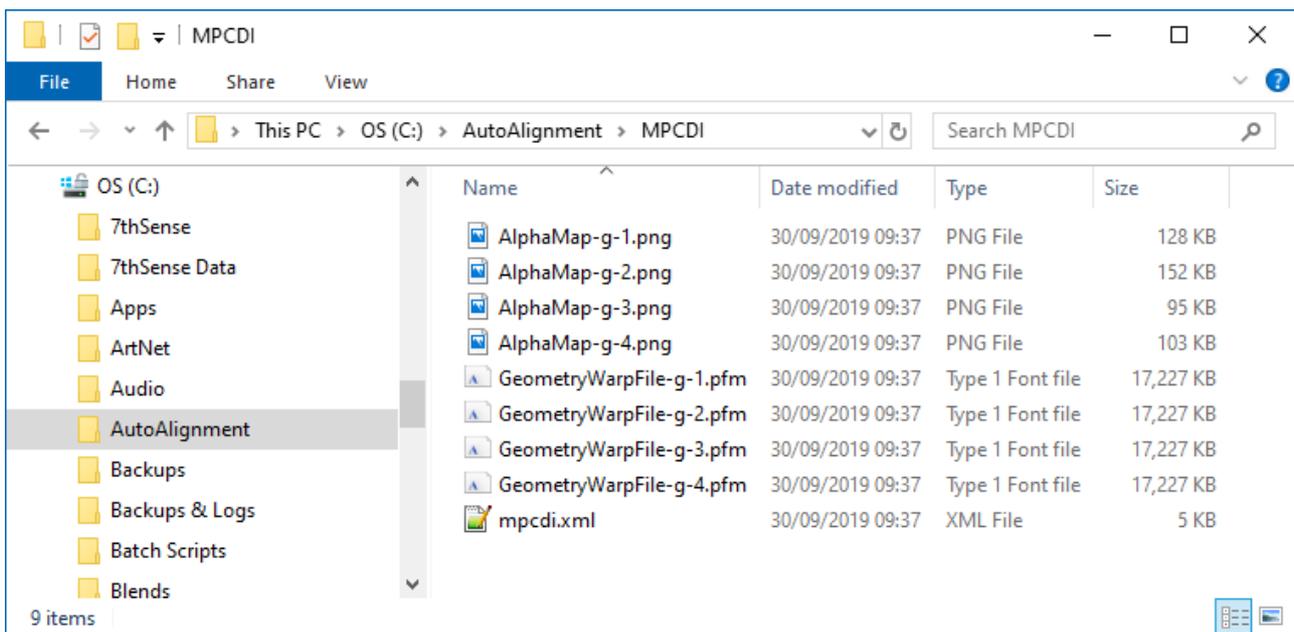


In Dome Mode, small changes to the Delta Radius number will allow you to finely adjust the position of the dome spring line.

Using MPCDI Data

One of the methods Delta can incorporate is MPCDI (Multiple Projection Common Data Interchange v.2, 2013). It is a common standard for exchange of channel blends and warps and projector positional data as defined by VESA (see [VESA Standards](#)) and can be used to import autoalignment data from VIOSO systems.

MPCDI files are stored in the standard folder for Delta: C:\AutoAlignment\MPCDI.

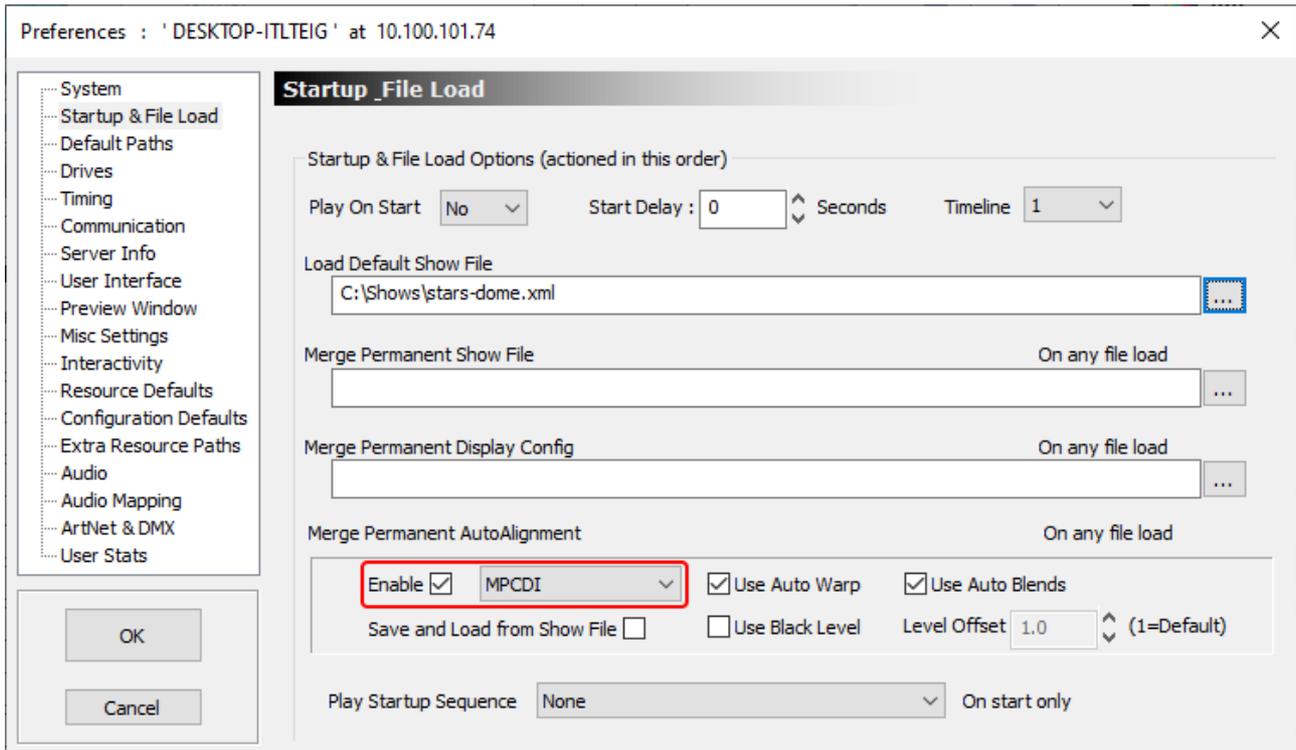


If you are receiving data from a third party source, check if the folder is zipped, and extract, or copy to this folder. The size of these files and the corresponding load that they add is a function of their resolution.

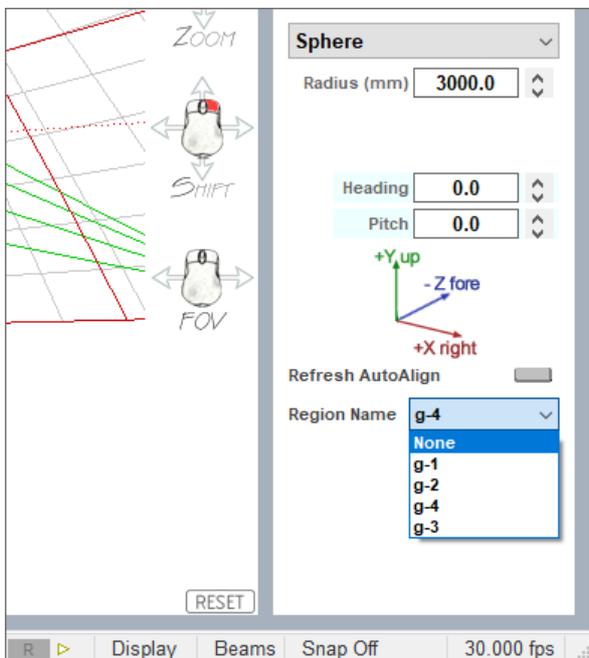
Note the file-naming standard, using the prefixes AlphaMap~ for the blend images, and GeometryWarpFile~ for the warps. The matching suffixes after a hyphen (in this example, g-1 to g-4) is what you will see in DeltaGUI. These are the MPCDI regions (Delta: channels). You need to know how these regions correspond to your Delta channel numbers so that you can match them up.

Configure Delta to Use MPCDI

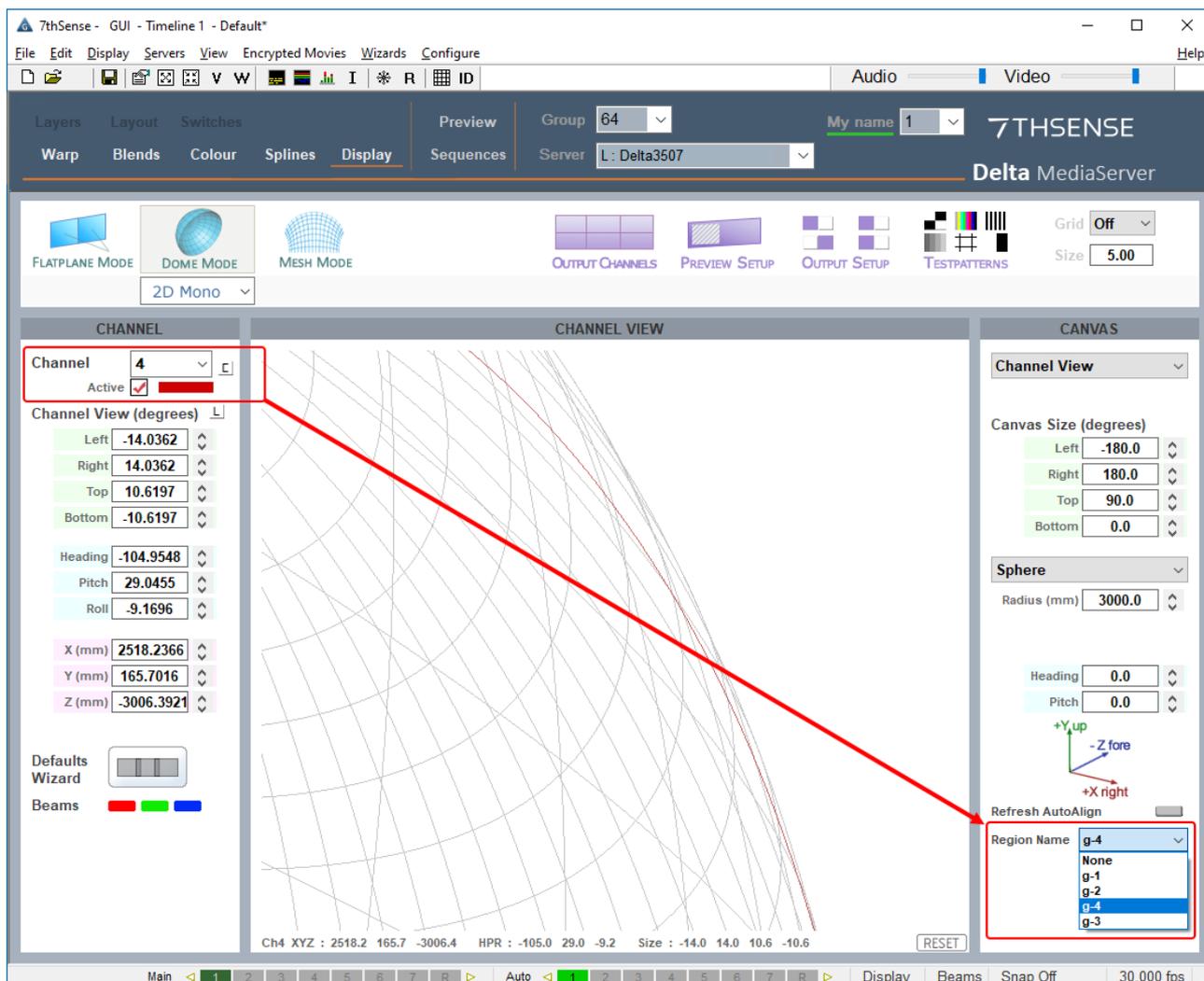
Enable MPCDI and check the required/available data, in DeltaGUI > *Preferences* > *Startup & File Load*:



In DeltaGUI > Display > Dome Mode, you may need to click the Refresh Autoalign button. If at the top of the main window you see 'Autoalign Active - Error reading files', make sure you have enabled the right selections and that all MPCDI files are present. You should then see the MPCDI Region Names listed in the dropdown menu:



Assign your output channels to MPCDI regions by selecting in turn the Delta output channel (top left), then the MPCDI region (bottom right). You should see the channels come live in Channel View in the colour of the channel:



Document Information

Date	Document edition	Software version	Revision Details	Author/Editor
February 2013	1.0	N/A	New release	Richard Brown
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August 2015	1.1a	N/A	Reformatted	Helen Ward
September 2017	2	Delta 2.5	Updated and reillustrated	Andie Davidson
September 2019	3	Delta 2.6	MPCDI alignment handling added	Andie Davidson

July 2020	4	Delta 2.6 and 2.7	Revised Leader-Follower terminology	Andie Davidson
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