Stagetracker II

BY TTA

User Manual

Additional information / errata / important points:

There is no DHCP server in the system. IP addresses must be set manually.

Remember to check that firewalls are open for the ports needed for the Stagetracker system.

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1 Introduction

1.1 Stagetracker II

The TTA Stagetracker II™ is the world leading solution for tracking of actors and artists on stage – indoor and outdoor.

The Stagetracker II™ support the following spatial/immersive audio solutions:

- DS100 from d&b
- L-ISA from L-Acoustics
- SARA II from Astro Spatial Audio
- HOLOPHONIX from Amadeus
- AFC4 from Yamaha
- Spat Revolution from Flux::
- TTA FX from TTA

The Stagetracker II™ support the following lighting and video solutions:

- PosiStageNet
- disguise media servers
- Art-Net

1.2 Products covered by this documentation

This documentation will cover the following products:

- 20000 Stagetracker II Core with display
- 21000 Stagetracker II Net
- 22000 Stagetracker II Tag
- 50000 Stagetracker Hybrid Cable
- 83000 Configuration and monitoring GUI

1.3 Technical support

For support questions not covered by this manual, we are happy to receive those by email to: support@tta-sound.com

Also, as the product and solutions are under constant development, there will be mismatch between this manual and the latest version of our SW and HW. If you find any such discrepancies, we are glad to receive feedback, preferably via email.

1.4 About this manual

This manual covers the following:

- Stagetracker II™ Hardware
- Planning
- Purchasing
- Installation
- Configuration and calibration
- Daily use and setup
- Troubleshooting guide

1.5 Permissions

The Stagetracker II™ is a tracking system based on 4.9 to 5.9 GHz WiFi transmitters and receivers. The end customer is responsible to obtain the necessary permits to operate the equipment in the wanted area. TTA AS will assist in this process.

1.6 Disclaimer

The information contained in this document is subject to change without prior notice. TTA AS shall not be liable for errors contained herein or for incidental or consequential damages about the furnishing, performance, or use of this document. It is the customer's responsibility to verify that they have the latest revision available by checking with TTA AS.

2 System description

2.1 Principles for tracking and use

The Stagetracker II™ system uses active devices (tags) that are positioned on a tracking object. These tags periodically transmit WiFi packets containing identification data, as well as 9 DOF sensor data and status data. These packets are received by directional receivers, the RadioEyes (RE).

One RE will find the direction towards a tag with a given precision. Using two (or more) REs one can calculate intersections between the vectors.

The REs is connected (power and data) to the Stagetracker II™ Net interface rack unit. This unit is in turn connected to the Stagetracker II™ Core processing rack unit. The Stagetracker II™ Core is a high-performance computer running the Stagetracker II™ suite of programs.

It is the nature of narrowband RF tracking solutions that reflections will occur. It will also be susceptible to shadowing, from bodies or stage props that somehow are electrically conductive. Part of the Stagetracker II™ solution is to handle these phenomena, and to do so we have defined objects and structures that aid in this. These will be covered in detail in a later chapter.

It is also important to be aware that the Stagetracker II™ is optimized for tracking of persons and objects - not tags. Small movements are filtered out, and the system should not respond to small, quick movements, e.g. a person turning around, and hold the position mostly steady during this.

Every audio or light output module has different requirements to the output signal parameters, and the Stagetracker II™ handles each of them differently.

3 Terms and definitions

3.1 Terms

In this document we use the following terms.

RE / RadioEye	This is the directional receiver. It contains 60 antennas that can be electrically tuned to function as a high gain directional antenna.
Tag	Small black rechargeable transmitter that is positioned using the REs. These tags are assigned to a Tracking Object, and typically worn hidden under the clothes.
Tracking Object	Person or object that are tracked. Each Tracking Object is assigned two Tags.
Output Position	The position that is transmitted to a Position Consumer.
Position Consumer	A piece of SW / HW that shall receive position information from the Stagetracker II™ over an ethernet connection.
Tracking Area	This term is used for the area / volume that we allow the objects to be positioned within. This will typically cover a bit more than the actual stage area, such as the crossover and the technical areas close to the actual stage area. Should not include the REs themselves.
Active Area	The area in which Stagetracker II shall supply position information to the Position Consumers. The Active Area can be different for different actors and for different Position Consumers. The Tracking Object position is still updated internally in the SW, but the Output Position is not changed until the Tracking Object enters an Active Area again.
User	Person that installs, configures and operates the Stagetracker II™.

3.2 Stagetracker II™ coordinates

In the world of lighting and sound systems there is a plethora of different coordinate systems and ways to specify a position and direction. Internally, Stagetracker II™ uses X, Y and Z / height:

- X is from stage right/house left to stage left/house right.
- Y is from downstage towards upstage.
- Height / Z is measured from the stage floor and upwards.

Thus, if you are seated in front of the stage:

- X is pointing to the right.
- Y is pointing away from you, towards the back of the stage.
- Height / Z is up.

3.3 Output coordinates

The various output modules may (and will) have different coordinate systems. The Stagetracker II™ system can convert from internal coordinates to the output coordinates using a set of transformations. These are described under each of the different output modules.

4 Stagetracker II™ hardware

4.1 Stagetracker II™ Core unit, front panel

Figure 1 Stagetracker II Core unit, front panel

The touchscreen on the front panel displays the following information:

- Stagetracker II™ Core status
- Current software version
- IP-address of the unit
- Temperature of the CPU
- Power on/off button

The beacon controlling the Tags is located onboard the Stagetracker II™ Core unit.
The antenna found on the front panel is for beacon/Tag communication (this antenna is not for tracking data purposes).

4.2 Stagetracker II™ Core unit, rear panel

Figure 2 Stagetracker II™ Core unit, rear panel

On the rear panel there are two network connectors and one powerCON™ connector for mains power along with the serial number of the unit.
The left network connector is marked «Stagetracker Network». This connector connects to any of the connectors marked «Stagetracker Network» located on the rear panel of the Stagetracker II™ Net unit.

The right connector is marked «Tracking Data Interface / LAN 🖧 ».
This connector connects to the Position Consumers, in most configurations a switch to which other customer hardware is connected. It's also where a computer is to be connected for setup and configuration of the Stagetracker II™ system.
See figure 14 for detailed link connections.
For all ethernet connections, use ethernet cables that meet the Cat5e standard or higher.

Ventilation
The Stagetracker II™ Core uses fans for cooling. Adequate space must be left for air flow around fans and vents when in use.

4.3 Stagetracker II™ Net unit, front panel

Figure 3 Stagetracker II™ Net unit, front panel

The Stagetracker II™ Net unit has three groups of connectors on the front panel which deploys power and network connection to the RadioEyes.
Each group also contains a fuse for the output power circuit and a LED indicating link between the Stagetracker II™ Net unit and the Stagetracker II™ RadioEye.

4.4 Stagetracker II™ Net unit, rear panel

Figure 4 Stagetracker II™ Net unit, rear panel

On the rear panel there are two network connectors and one powerCON™ connector for mains power along with the serial number of the unit.
One of the two network connectors connect to the left network connector on the Stagetracker II™ Core unit marked «Stagetracker Network» as described above.
The other network connector is used for daisy chaining multiple Stagetracker II™ Net units if more than three RadioEyes are used. See figure 14 for detailed link connections
For all ethernet connections, use ethernet cables that meet the Cat5e standard or higher.

Ventilation
The Stagetracker II™ Net uses fans for cooling. Adequate space must be left for air flow around fans and vents when in use.

4.5 Stagetracker II™ RadioEye

The Stagetracker II™ RadioEye connects to the Stagetracker II™ Net units front panel connections, RadioEye 1-RadioEye 2-RadioEye 3.
There are two cable connections, one for power (48V DC), and one for ethernet connection. The label with serial number and IP-address is found on the backplate of the RadioEye.

Figure 5 Stagetracker II™ RadioEye front cover

Figure 6 RadioEye mounting bracket and cable connections.

The RadioEye is supplied with two 48 mm half couplers attached to the bracket and one eye bracket for the safety wire. Secure the RadioEye with a safety wire that is approved for the weight of the RadioEye so that the safety wire will hold the RadioEye if a primary attachment fails.

Figure 7 RadioEye with drop arm accessories

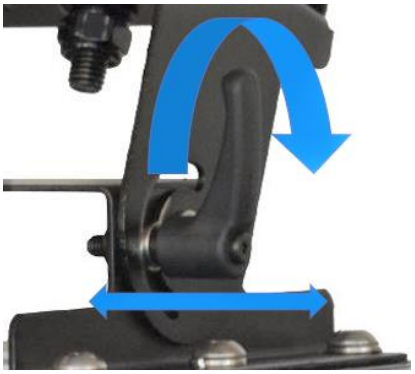


Figure 8 RadioEye, tilt adjustment handle

To angle and position the RadioEye there are two spring loaded handles on the sides of the bracket. To loosen the bracket, pull the handle out and turn clockwise and then push the handle back in again and loosen the handle. Do the opposite to tighten the bracket.

TTA recommends using a drop arm (e.g. a ø48mm half coupler with a fixed ø48mm pipe, as in Figure 7) when installing the RadioEye to ensure that the RadioEye will be positioned beneath other equipment such as light fixtures etc.

4.6 Stagetracker II™ Tag

Figure 9 Stagetracker II™ Tag, TTA logo

Figure 10 Stagetracker II™ Tag identification/MAC address

The Stagetracker II™ Tag is to be used with the TTA logo facing upwards. For identification of the device, the four last digits of the mac address found on the opposite side of the TTA logo is used. For example, when assigning Tags to a Tracking Object the identification number of available Tags appears in the dropdown menu for selection.

The Stagetracker II™ Tag is equipped with a mini-USB B female connector for charging of the device.
Use a mini USB-B Male > USB-A Male cable to connect the Stagetracker II™ Tag to a charger that meets the USB battery charging specification BC1.2.

Figure 11 Stagetracker II™ Tag charging

The LED next to the USB socket will begin to flash red when charging. If the device is fully discharged it can take a while before the LED begins to flash.
When the Tag is fully charged LED turns solid green.

When the Tag is connected to a running Stagetracker II™ Core unit, and the Tags are turned on from the Stagetracker II™ Controller software, the LED is rapidly flashing green.

4.7 Tag charger

TTA supplies third party USB battery chargers, currently two different models are available:

Model 1 - 13 x USB 3.0 Type-A interfaces + 1 USB fast-charge port, 5V/2.4A
Model 2 - 7 x USB 3.0 Type-A interfaces + 3 USB fast-charge ports, 5V/2.4A

4.8 Stagetracker II™ Hybrid cable

The Stagetracker II™ Hybrid cable carries ethernet and power to the Stagetracker II™ RadioEyes from the Stagetracker II™ Net unit.
The cable end with the male Amphenol EcoMate connector (power) connects to the Stagetracker II™ Net unit. The other end is a female Amphenol EcoMate connector and connects to the Stagetracker II™ RadioEye.
Ethernet connectors are Neutrik etherCON.
It is possible to link several Stagetracker II™ Hybrid cables to extend the length of the cable with an ethernet coupler.

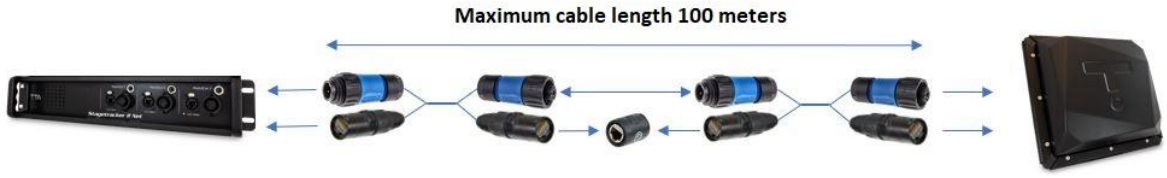


Figure 12 Hybrid cable connections

Maximum total cable length is 100 meters, Cat5e standard.

Standard cable lengths are shown in figure 13. For other lengths, please contact TTA on sales@tta-sound.com

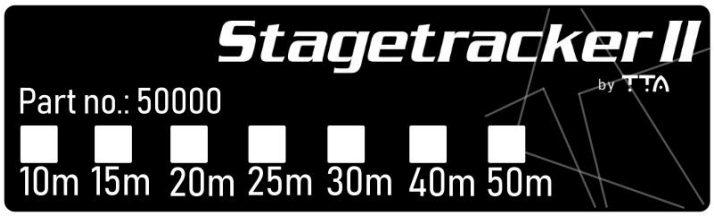


Figure 13 Stagetracker Hybrid cable, standard lengths

4.9 Link connections

Illustration of link connections Stagetracker II™ configuration with customer hardware.

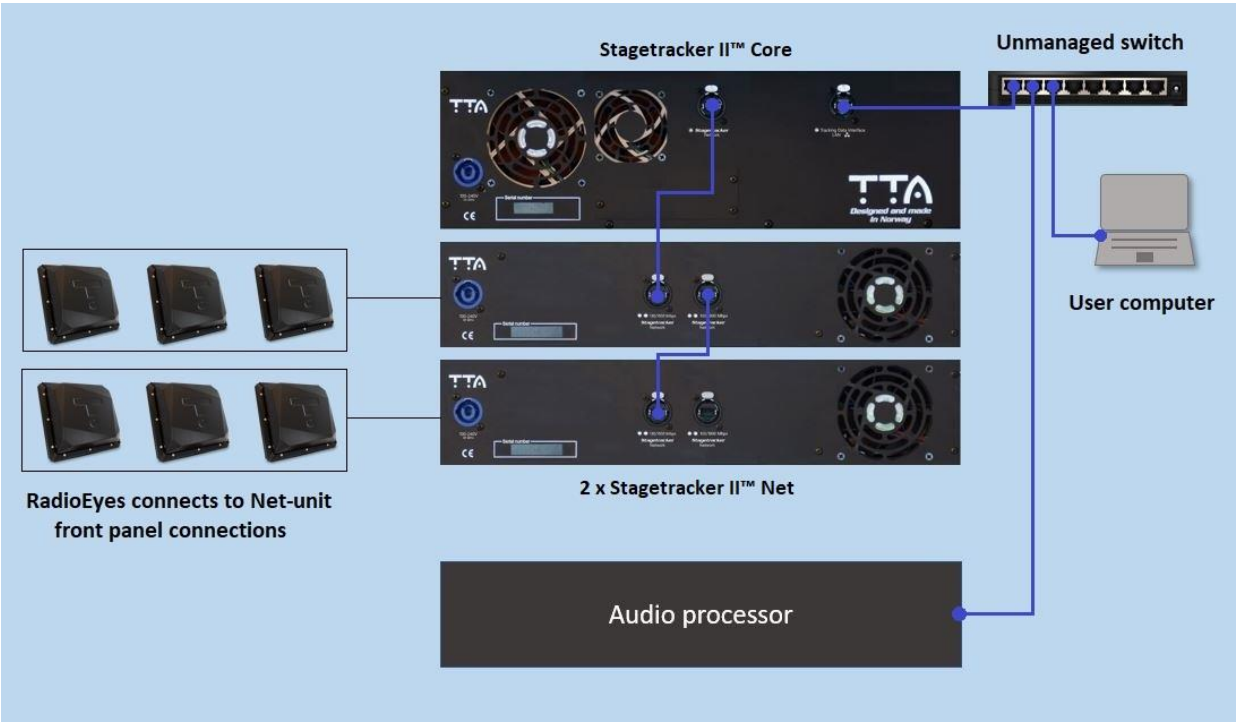


Figure 14 Stagetracker II™ link connections

4.10 Technical specifications

Stagetracker II™ Core

Power requirements	100-240VAC, 47-63 Hz
Power consumption	400 W
Mains Power Connector	Neutrik PowerCon
Connector Ethernet	Neutrik EtherCon
Connections Ethernet	1 x Stagetracker II Net
	1 x Gigabit positional data output
Dimensions	19" Rackmount, 3 RU
	D: 485 mm
	W: 430 mm
	H: 133 mm
Net Weight	11,9 kg

Stagetracker II™ Net

Power requirements	100-240VAC, 47-63 Hz
Power consumption	200 W
Mains Power Connector	Neutrik PowerCon
Connector Ethernet	Neutrik EtherCon
Connections	3 x RadioEye 48V DC Power (front panel)
	3 x RadioEye Ethernet (front panel)
	2 x Stagetracker II Network (rear panel)
Dimensions	19" Rackmount, 2 RU
	D: 485 mm
	W: 430 mm
	H: 90 mm
Net Weight	8,8 kg

Stagetracker II™ RadioEye Sensor

Power requirements	48v DC
Operating frequency	4,9-5,9 GHz
Coverage angle	100 degrees
Accuracy	+/- 0,25 degrees
Internal antennas	60
Operating temperature	-20 to +55 degrees Celsius
Connector 48v DC power	1 x Amphenol EcoMate, Male
Connector Ethernet	1 x Neutrik EtherCon
Dimensions	D: 366 mm
	W: 366 mm
	H: 290 mm (with mounting bracket)
Net Weight	10,5 kg

Stagetracker II™ Tag (transmitter)

Operating frequency	4,9-5,9 GHz
Positions per second	40
Sensors	Roll, pitch, rotation, gyro
Battery life in use	> 5.5 hours fully charged
Charging time	1.5 hours
Coverage	~ 200 meters
Dimensions	D: 50 mm
	W: 36 mm
	H: 11 mm
Net Weight	16 grams

5 Stagetracker II™ software

5.1 System requirements:

- Windows 10 64-bit
- At least 4 GB RAM
- Screen resolution: 1920 x 1080
- > 500 MB available disk space

5.2 Installing and connecting the Stagetracker II™ Controller software

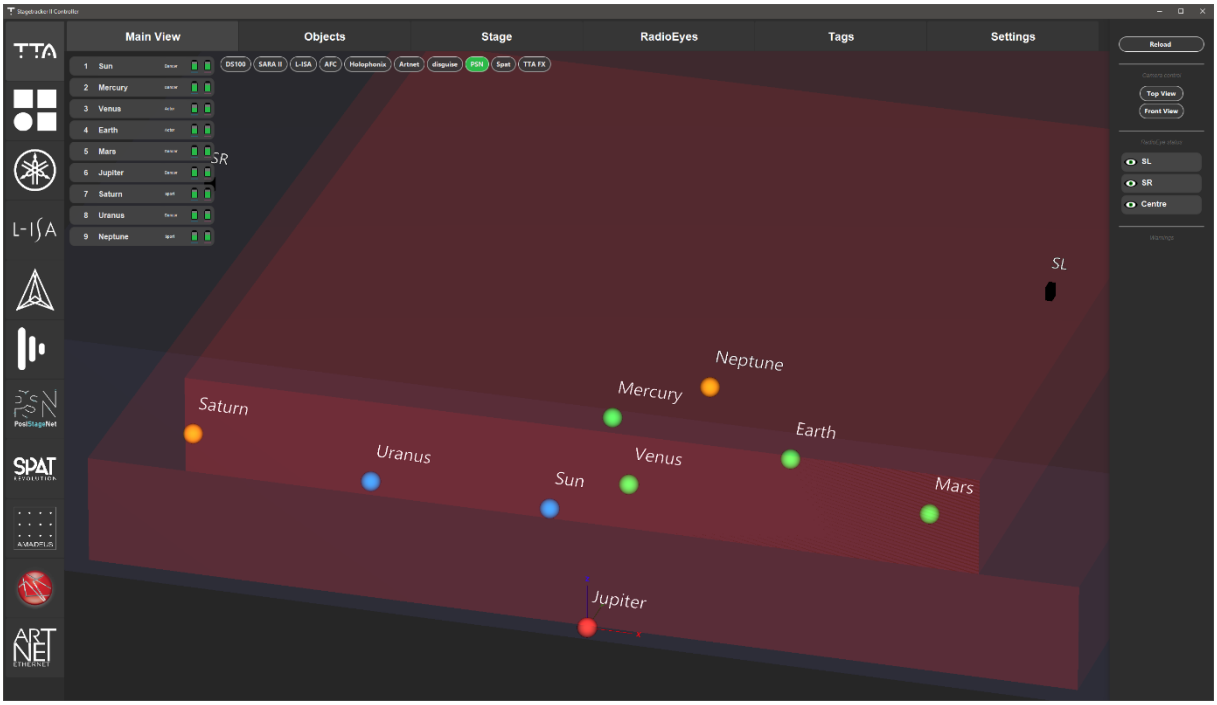
See chapter 8.2 for installing and connecting the Stagetracker II™ Controller to the Stagetracker II™ system.

5.3 Stagetracker II™ Controller overview

The Stagetracker II™ Controller is used for all configuration and setup of the Stagetracker II™ system. The Stagetracker II™ Controller is structured with several tabs to the left. These tabs will switch between common parameters (TTA tab) and parameters specific to the Position Consumers. The Position Consumers are covered in separate chapters under chapter 10. See chapter 9 for Setup and configuration with the Stagetracker II™ Controller.

5.3.1 Main view

The Main view is intended for use during live performances, displaying real time data and system overview. To the left are the list of active Tracking Objects with battery indicators for each tag. To the right there is a list of Stagetracker II™ RadioEyes with connectivity indicator, as well as a panel for status messages and alerts. Quick access for Top and Front view of the 3D plot are also found at the right-hand side of the screen. At the top of the screen there's plot toggles for the various output modules in the Stagetracker II™ system. This way the User can in real time monitor the position of the Tracking Object. The 3D plotter can be moved, rotated, and zoomed in and out of.

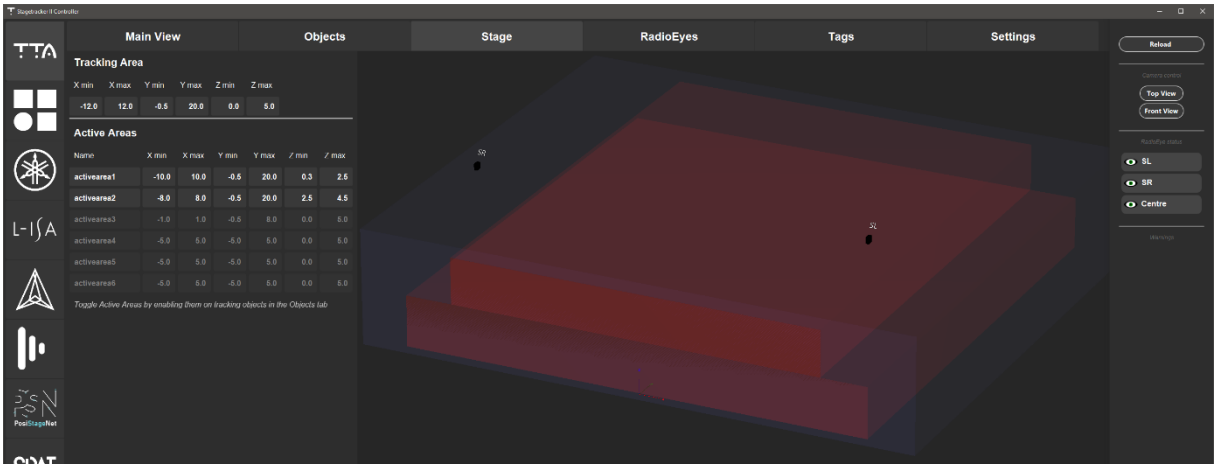


5.3.2 Objects

In the Objects tab the User can define Tracking Objects, give them names, assign numbers, and select tags attached to them. There is a drop-down menu allowing the User to define what kind of Object type the Tracking Object is, e.g. Presenter or Dancer. The User can also assign Active Areas. The Active Areas will be covered in the Setup and configuration chapter 9.3. The User can enable or disable the tracking output of Tracking Objects with the click of a button.

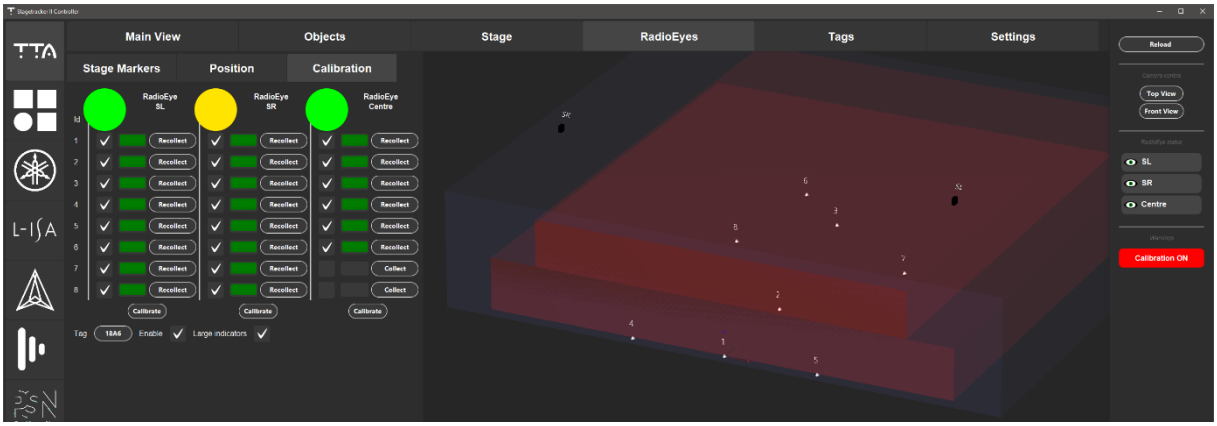
5.3.3 Stage

The Stage tab is used to configure the Stage setup, with the Tracking Area and the Active Area. These are covered in depth under the Setup and configuration chapter, chapter 9.3.



5.3.4 RadioEye

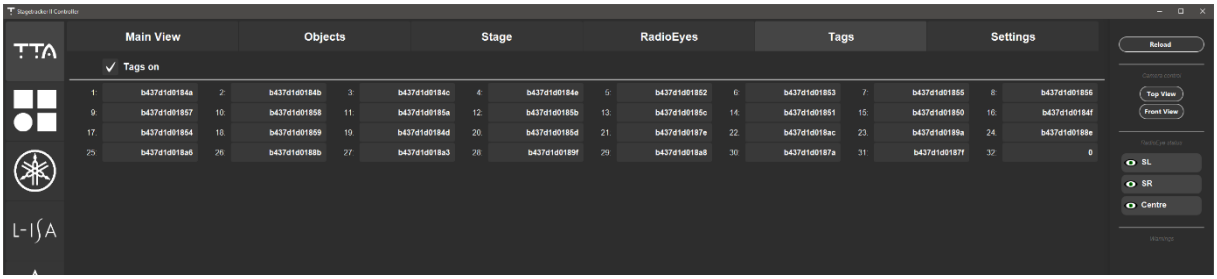
The RadioEye tab holds the positioning, setup, and calibration of the RadioEyes. With Stage Markers the Stagetracker II™ system calibrates the Stagetracker II™ RadioEyes for good tracking and optimal performance with the help of Stagetracker II™ Tags. These tabs are covered in depth under the Setup and configuration chapter, chapter 9.4.



5.3.5 Tags

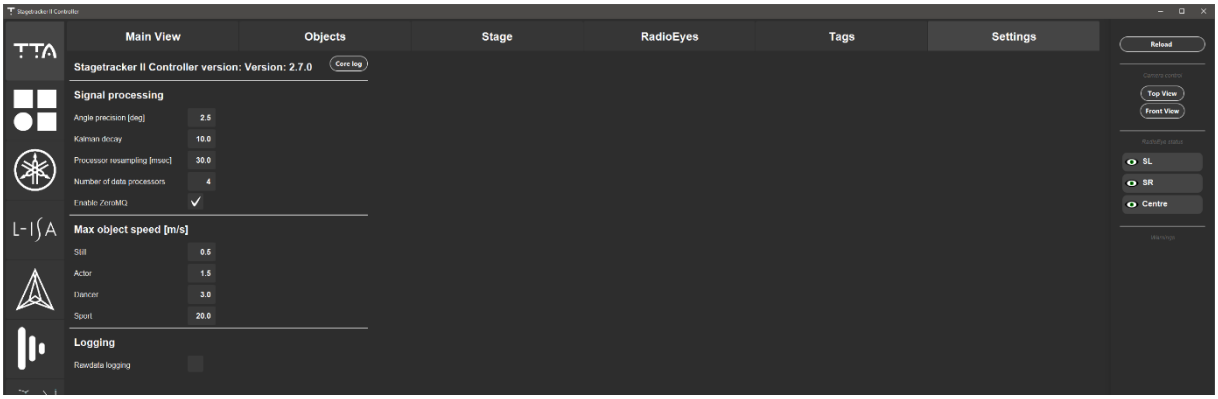
The Tags tab is intended for initial configuration of the Stagetracker II™ systems inventory of Stagetracker II™ Tags. The User enters all MAC addresses for every Stagetracker II™ Tag to be used with the Stagetracker II™ system, to allow coordination of internal components and for the Stagetracker II™ Tags to be available to the User to assign to Tracking Objects in the Objects tab. There is also a handy All Tags Off switch to allow the User to power down all Stagetracker II™ Tags in vicinity to save power.

All Stagetracker II™ systems are delivered with a show file populated with the Stagetracker II™ Tags that comes with the initial shipment. Stagetracker II™ Tags sent after the initial configuration must be entered by the User in the Stagetracker II™ Controller.



5.3.6 Settings

The Settings tab holds all user accessible settings for the Stagetracker II™ system. Here the User can find functionality like raw data logging, fine tuning of tracking parameters and debugging tools (after consultation with TTA).



5.4 Stagetracker II™ Core web panel

The Stagetracker II™ Core web panel holds information about the running system, and the settings for show file and software management. These are all the functions of the web panel:

- Monitor system processes.
- Show file management. Load, copy, delete, download, and upload show files to the Stagetracker II™ system.
- Software management. Load, delete and upload Stagetracker II™ Core software to the Stagetracker II™ system.
- Download the Stagetracker II™ Controller.
- Download raw tracking data logs. These are used by TTA for debugging.
- Download system logs for debugging.
- Restart the Core processes.
- Reboot the Core.

5.4.1 Show file management

Within the show file manager, the User can load, copy, delete, download, and upload show files to the Stagetracker II™ system. This manager is found at the top of the web panel, right beneath the monitor panel for the system processes.

5.4.2 Software management

To upgrade the Stagetracker II™ Core software you upload the new version to the web panel as described in chapter 8.2.4. Software versions can be rolled back and forth with just a few clicks and will always be available if they are not deleted by the User. TTA recommends to always use the latest version for the best tracking result, features and stability.

5.4.3 Download the Stagetracker II™ Controller

Downloading the Stagetracker II™ Controller is described in chapter 8.2.2. Only the system compatible Stagetracker II™ Controller version will be available for download.

5.4.4 Download raw tracking data logs

TTA can request the User to create and send logs for off-site fine tuning. The system can do raw data logging and is described in chapter 9.6.2.

To download a raw data log, go to the Raw data download section in the Stagetracker II™ Core web panel, click Dump file and then Download. Send the downloaded file to TTA for debugging and analysis.

5.4.5 Download system logs for debugging

TTA can request the User to create and send logs for off-site debugging. To download a system log, go to the link found at the bottom of the web panel and either copy the contents of the web page, or print the page to PDF before sending the result to TTA.

5.4.6 Restart Core processes

At the bottom of the Stagetracker II™ Core web panel there is a button to Restart Core processes. The button restarts the system processes and is a way of quickly cleaning up if the system seems to be acting up. If the system runs slow, we recommend doing this and restarting the computer.

5.4.7 Reboot the Core

There is also a button to reboot the Stagetracker II™ system. As with other electronics the system sometimes needs to do a reboot to feel fresh.

6 Planning the Stagetracker II™ installation

TTA is happy to assist on the planning of the installation, contact via email to support@tta-sound.com

When planning an installation, the most critical decision is the positioning and number of Stagetracker II™ RadioEyes.

The three important parameters[1] when calculating coverage are:

1) RE opening angle, θ. A RE has an opening angle of +/- 50 degrees. The usable region is much like light from a spotlight, projecting a pyramidal shape.
2) Reading range. The maximum reading range is 200 meters.
3) Angular resolution, $\Delta\theta$, of 0.1°. This parameter describes the separation needed between two tags for the RE to detect them as separate. This parameter is set by the processing SW. Output accuracy is heavily influenced by the positioning algorithms / filter bandwidths.

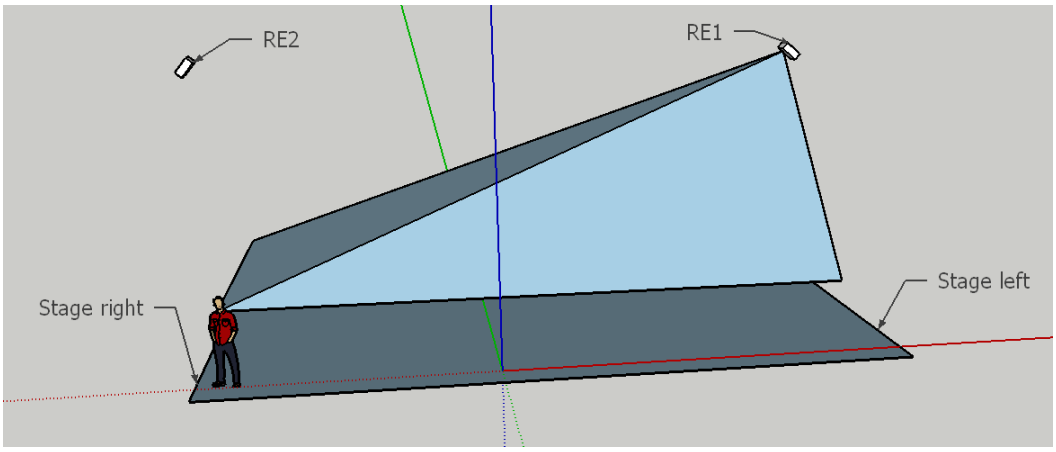


Figure 15 Illustration of RE coverage. The pyramid is cut at approximately tag height

It is important that there are no objects close to the RE within an angle of +/- 60 degrees. Presence of any such objects may distort the positioning accuracy of the system. See figure 17 for example of RadioEye installation.

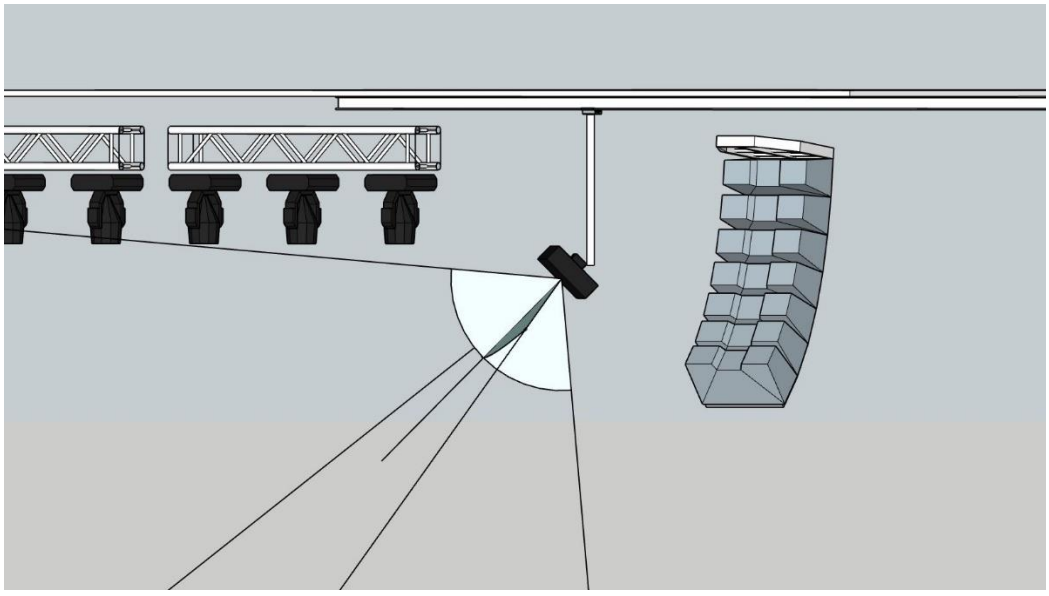


Figure 16 Illustration of RadioEye installation

[1] See data sheet for correct parameter values. Numbers used in these calculations are for illustration purposes.

6.1 Positioning accuracy

To get a feeling with the positioning accuracy, consider the angle with which the vector from the RE through the tag intersects the plane that the tracked object moves in. For more accurate positioning in the plane, the intersection angle should be as steep / close to 90 degrees as possible, see Figure for an illustration.

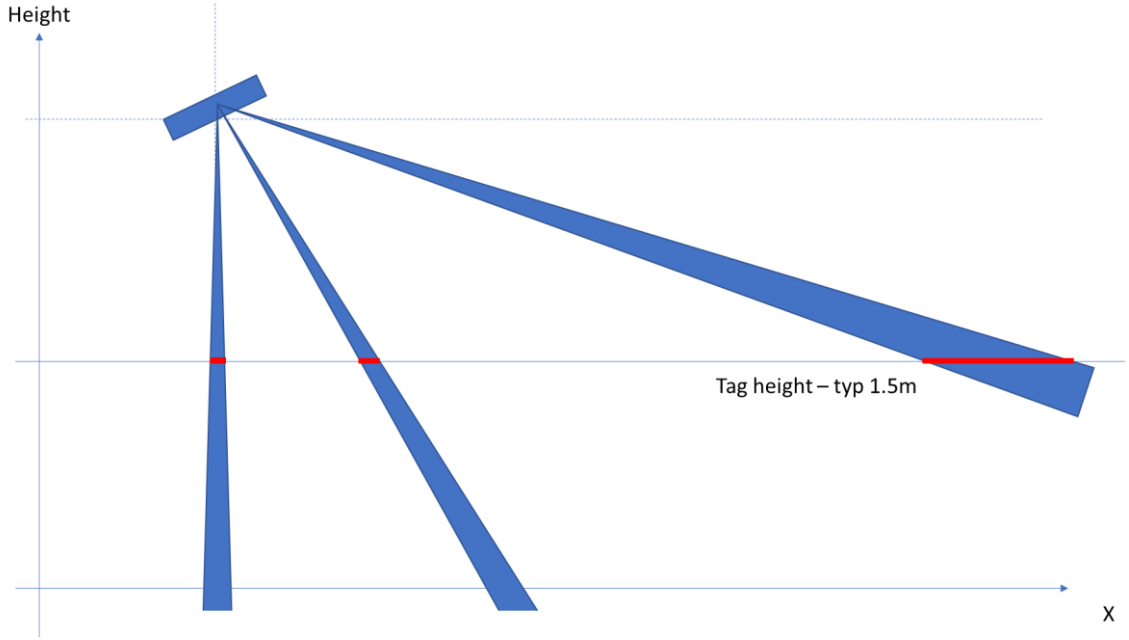


Figure 18 Translation of angular accuracy to positional accuracy. Uncertainty is exaggerated for illustration purposes.

6.2 Calculating coverage / usable area

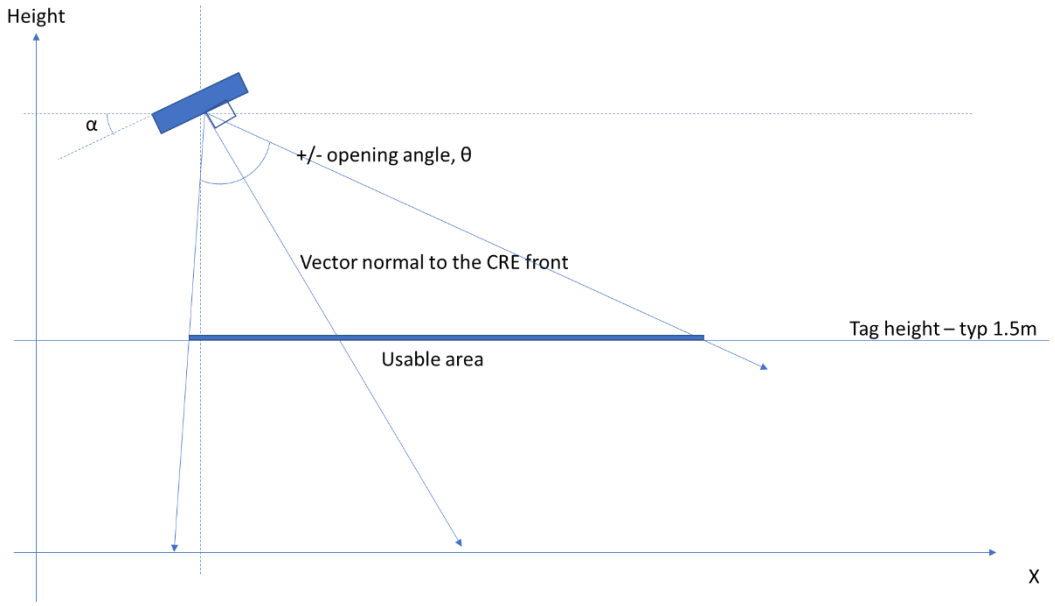


Figure 19 Usable area seen from the house. Angles does not represent actual opening angles.

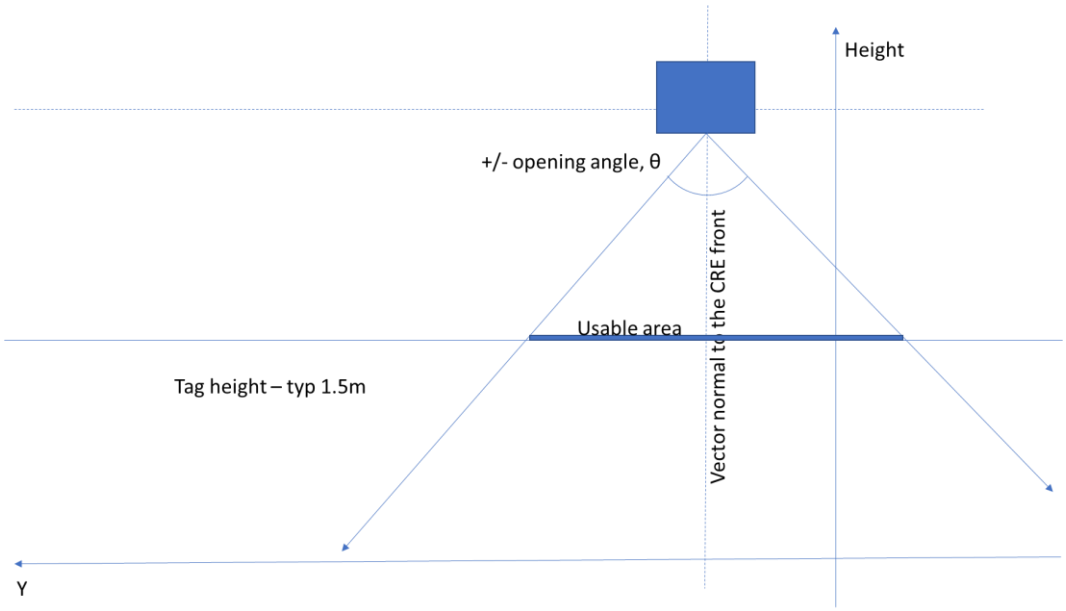


Figure 20 Usable area seen from stage left

Considering the two figures above, and taking the position of the RE to be (x_c, y_c, z_c) we can calculate the usable area for different cases.

6.3 Coverage in x-axis

Refer to Figure 21 Calculating the usable area. If we vary the mounting angle α and the RE height we get the following matrix of usable area (along the x-axis) given in Table 1. The opening angle is set to 50 degrees in these calculations. For angles above 40 degrees we will cover the entire stage to the right of the RE. This would be the optimal angle if we can position the RE freely. There are often other limitations to the positions that we can use. See Table 2 for usable area "to the left" of the RE.

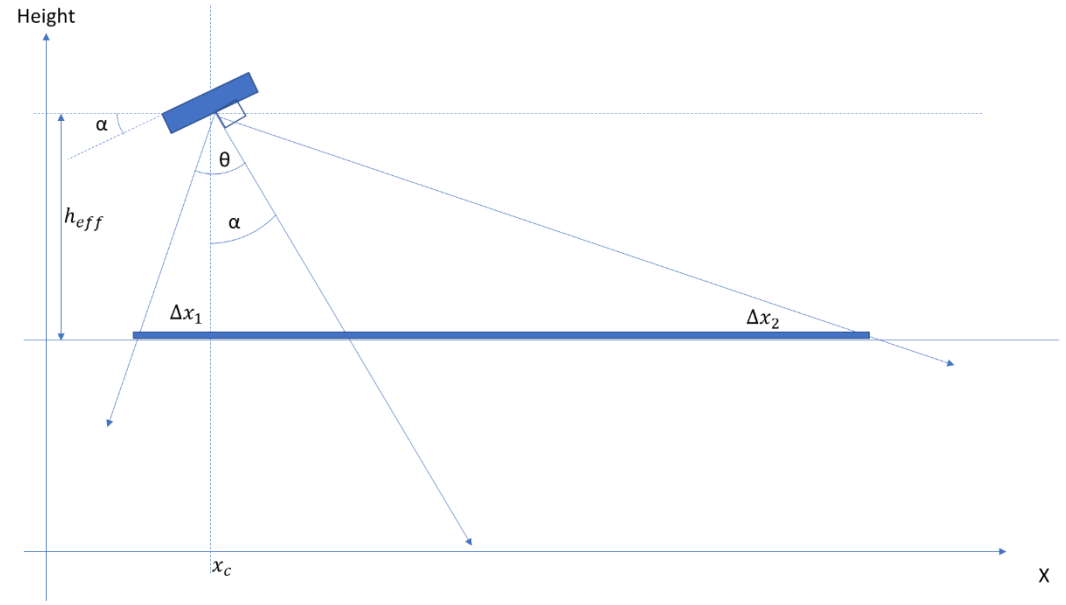


Figure 21 Calculating the usable area

The following equations apply:

$$\Delta x_1 = h_{eff} \cdot \tan(\theta - \alpha)$$

$$\Delta x_2 = h_{eff} \cdot \tan(\theta + \alpha)$$

In these tables, h_{eff} is the RE height above the tag.

Table 1 Usable area, x-axis: $\Delta x_1 + \Delta x_2$

h_{eff} [m] α[deg]	1.5	2	3	4	5	6
0	3.6	4.8	7.2	9.5	11.9	14.3
10	3.9	5.1	7.7	10.3	12.9	15.4
20	5.0	6.6	10.0	13.3	16.6	19.9
30	9.1	12.1	18.1	24.1	30.2	36.2
40	Inf	Inf	Inf	Inf	Inf	Inf
50	Inf	Inf	Inf	Inf	Inf	Inf

Table 2 Usable area to the left of the RE: Δx_1

h_{eff} [m] α[deg]	1.5	2	3	4	5	6
0	1.8	2.4	3.6	4.8	6.0	7.2
10	1.3	1.7	2.5	3.4	4.2	5.0
20	0.9	1.2	1.7	2.3	2.9	3.5
30	0.5	0.7	1.1	1.5	1.8	2.2
40	0.3	0.4	0.5	0.7	0.9	1.1
50	0.0	0.0	0.0	0.0	0.0	0.0

6.4 Network topology

The beacon controlling the Tags is located onboard the Stagetracker II™ Core unit therefor the unit must be located close to the tracking area.

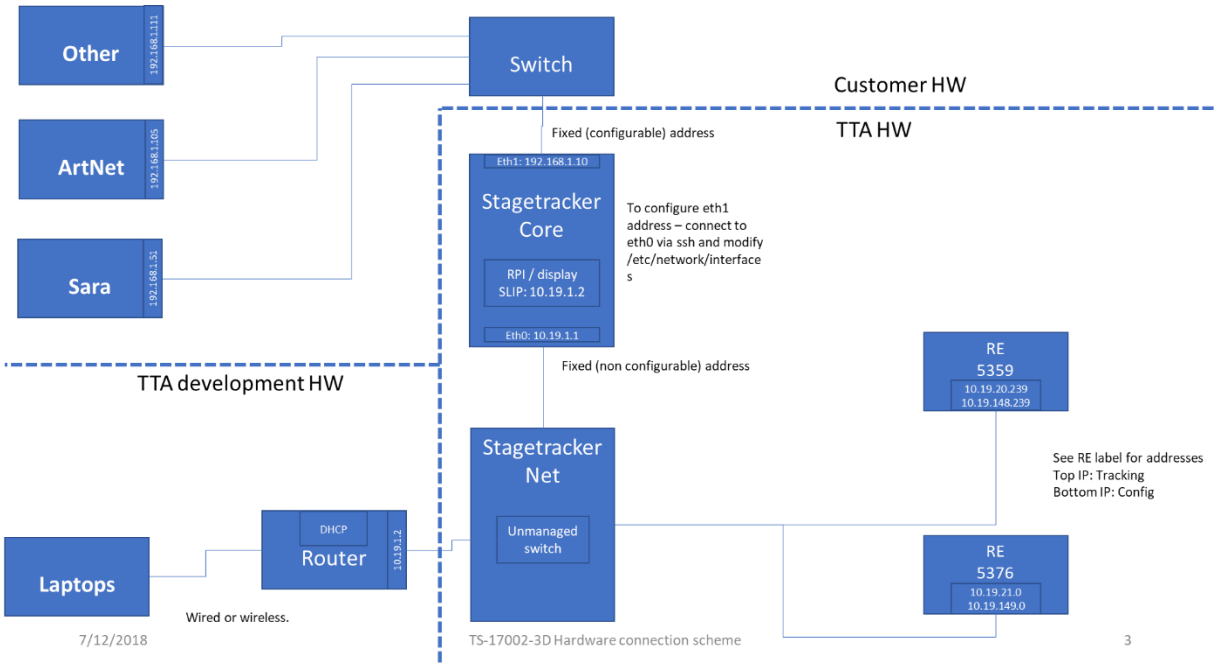


Figure 22 Stagetracker II™ network topology with two RadioEye configuration

7 Tags and objects

For optimal tracking, the tags should be positioned on the top of the shoulders of the actors, with the TTA logo facing upwards. See Figure .

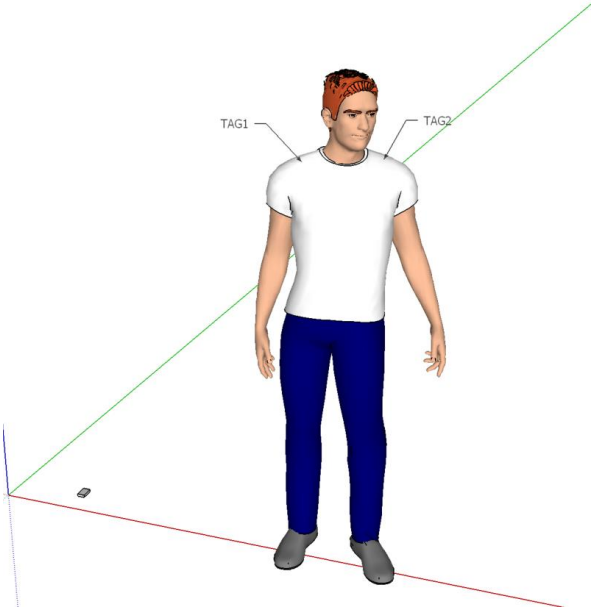


Figure 23 Tag placement

Unused tags should be kept on the charger station. They will then be fully charged and ready for use, and they will not use CPU resources on the Core when not needed.

The tags will not transmit anything while they are on the charger and will show up with no signal in the monitor view.

8 Installing and connecting to the Stagetracker II™ system

8.1 Hardware installation

This section assumes that the User is familiar with the install and usage of the third-party hardware and software the Stagetracker II™ system will provide positioning data to (Position Consumers).

8.1.1 Connecting the Stagetracker II™ Core and Net

Install the Stagetracker II™ Core and Net in a secure and well-ventilated rack enclosure close to the stage area. Connect the units to a power outlet with the supplied PowerCon cable found in the packaging and connect the Stagetracker II™ Core and Net together with the supplied Cat5e patch cable through the Stagetracker Network port found on the back of the units. Link the Stagetracker II™ Net units together with the second Stagetracker Network on the back of the first Stagetracker II™ Net unit if your system is supplied with more than one Stagetracker II™ Net.

8.1.2 Connecting the Stagetracker II™ RadioEyes

Connect the Stagetracker II™ RadioEye to the front panel of the Stagetracker II™ Net with the supplied Stagetracker II™ Hybrid cable. Ensure to connect power cable to both units before connecting the network. A status LED will light up when successfully connected.

Where Stagetracker II™ Hybrid cables cannot be run it is an option to use a Stagetracker II™ Local PSU for RadioEye and a separately installed Cat5e network cable connected directly to the Stagetracker II™ Net.

8.1.3 Connecting the Stagetracker II™ system to the network

1. Connect the Stagetracker II™ Core Tracking Data Interface (LAN) port to a network switch with a Cat5e network cable and connect the Position Consumers to the same network. Connect a dedicated computer for setup and configuration of the Stagetracker II™ system to the network as well. For system requirements, see chapter 5.1.

2. Power on the Stagetracker II™ system by pressing the Power On button on the touchscreen display on the front panel of the Stagetracker II™ Core. The unit has successfully powered on when the touchscreen display shows the internal temperature, IP address and Stagetracker II™ Core software version.

8.2 Software installation

This section covers the installation and upgrading of the software for the Stagetracker II™ Core and Controller. For setup and configuration of the tracking parameters and communication between the Stagetracker II™ system and third parties, see chapter 9 (Setup and configuration) and 10 (Output modules).

8.2.1 Network configuration

In the following description we are using the factory default IP address of the Stagetracker II™ system, 192.168.100.120. The current IP address of your Stagetracker II™ system is found on the touchscreen display on the front panel of the Stagetracker II™ Core. To connect to the Stagetracker II™ system you need to set a static IP address on your computer in the same IP range as the Stagetracker II™ Core, as there is no DHCP server in the Stagetracker II™ system.

The IP address of the Stagetracker II™ system can be changed by TTA.

The following procedure is for systems running Windows 10. For other versions, the procedure might differ. Consult the manual for your equipment if necessary.

1. Open the Control Panel and go to the following menu.

   Control Panel > Network and Internet > Network and Sharing Center > Change adapter settings (found in the left-hand menu)

2. Right click the network interface that is connected to the Network from chapter 8.1.3 and choose Properties. In the new window find Internet Protocol version 4 (TCP/IPv4) in the menu and select Properties.

3. Select Use the following IP address, and enter the following.

   IP address: 194.168.100.xxx (in the range of 2-254, except the IP address of the Stagetracker II™ Core)
   Subnet mask: 255.255.255.0

4. Click OK and then Close.

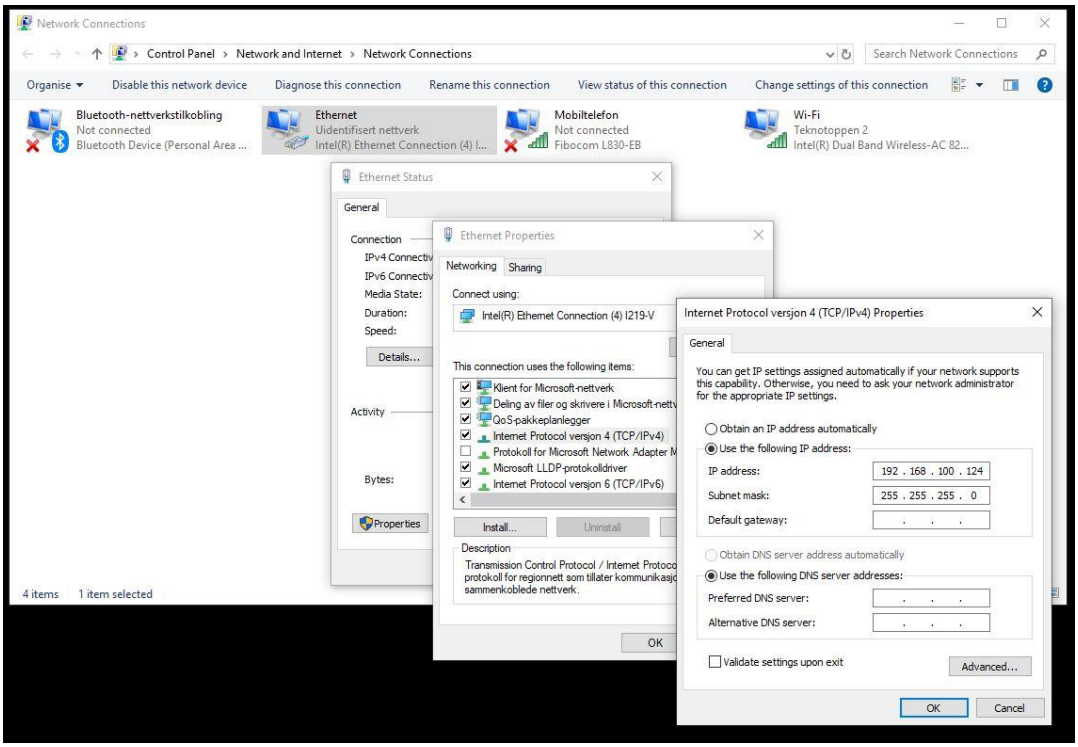


Figure 17 Internet Protocol version 4 (TCP/IPv4) Properties window

8.2.2 Downloading and installing the Stagetracker II™ Controller

1. Download the Stagetracker II™ Controller software to your computer from the Stagetracker II™ Core web panel. To access the web panel, go to the IP address found on the touchscreen display on the Stagetracker II™ Core in your web browser of choice.
2. Locate the downloaded Stagetracker II™ Controller installer and run it. Enter user credentials if prompted.

8.2.3 Connecting to the Stagetracker II™ system

Make sure that the Stagetracker II™ Controller software and the Stagetracker II™ Core software versions match each other, see below. TTA will assist on the latest matching software on email request: support@tta-sound.com.
The Stagetracker II™ Core software version is found on the touchscreen display on the front panel of the unit.

Example of matching software versions:
Stagetracker II™ Controller software: Stagetracker II Controller 2.6.1.msi
Stagetracker II™ Core software: Stagetracker_R2.6.1rcxx.tta

The Stagetracker II™ Controller version that matches the Stagetracker II™ Core software can be found at the web panel of the Stagetracker II™ Core.

1. Open the installed Stagetracker II™ Controller on your computer and enter the IP address found on the touchscreen display on the Stagetracker II™ Core.

2. The first time you connect to the Stagetracker II™ system you need to allow the Stagetracker II™ Controller access through the Windows Defender Firewall. You will be prompted by a window like the one in Figure xx. Make sure to allow access for both Private networks and Public networks.

   If there is running any third-party firewalls on the computer, the Stagetracker II™ Controller needs to be allowed full access through those as well for it to function. The Stagetracker II™ Controller might open but it will not function correctly. Consult the manual for the firewall software if needed.

3. When the Stagetracker II™ Controller can connect to the Stagetracker II™ system it will begin loading the parameters from the Stagetracker II™ Core. The progress will be displayed by the loading bar on the screen. This will only take a few seconds.

8.2.4 Upgrading the Stagetracker II™ Core software

New Stagetracker II™ Controller and Core software releases will be available from the TTA website.

For the moment we will send you a download link to the latest Stagetracker II™ Controller and Core software via email upon request to support@tta-sound.com.

1. Download the Stagetracker II™ Core software to be installed on the Stagetracker II™ Core and locate it on your computer.
2. Go to the Stagetracker II™ Core web panel with the IP address found on the touchscreen display on the Stagetracker II™ Core in your browser of choice.
3. Scroll down to the software section and upload the Stagetracker II™ Core software to be installed. Click Upload and Install Software Package. After a few seconds you will be returned to the web panel with an upgraded system.
4. Download the latest Stagetracker II™ Controller, as described in chapter 8.2.2 above.

Using an older Stagetracker II™ Controller version than the Stagetracker II Core will result in unstable performance and new functions will not operate properly. No data will be lost when upgrading the Stagetracker II™ Controller. If there is uncertainty as to what version is running of the Stagetracker II™ Controller*, it is recommended to download and install the latest one from the Stagetracker II™* Core.

Some major updates require the User to upload a new show file. This will be mentioned by TTA if necessary.

If necessary, you can always roll back to previous versions of the Stagetracker II™ Core software, given that the previous version(s) is still installed on the system.

9 Setup and configuration

This section assumes that the User has installed the hardware and software for the Stagetracker II™ system described in chapter 8 and successfully connected the Stagetracker II™ Controller to the Stagetracker II™ system.

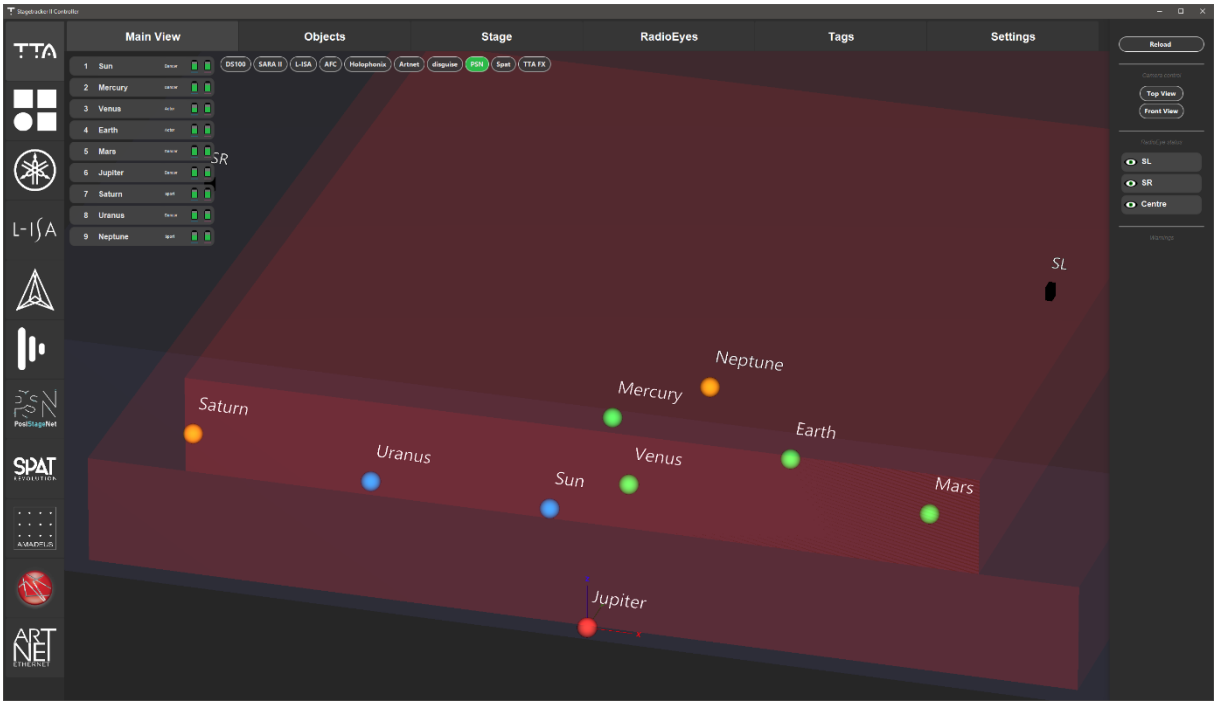
In this chapter the process of the initial setup and configuration is described, as well as the individual tabs in detail. If any of these steps is left out the Stagetracker II™ system will not function properly. Contact TTA at support@tta-sound.com or your contact person for questions regarding the setup and configuration procedures described in this chapter.

9.1 Main View

As described in chapter 5.3.1, the Main View is intended for use during live performances to monitor the system and its outputs. Here the User can monitor that the Stagetracker II™ system behaves as expected and get a quick overview if there is something wrong.

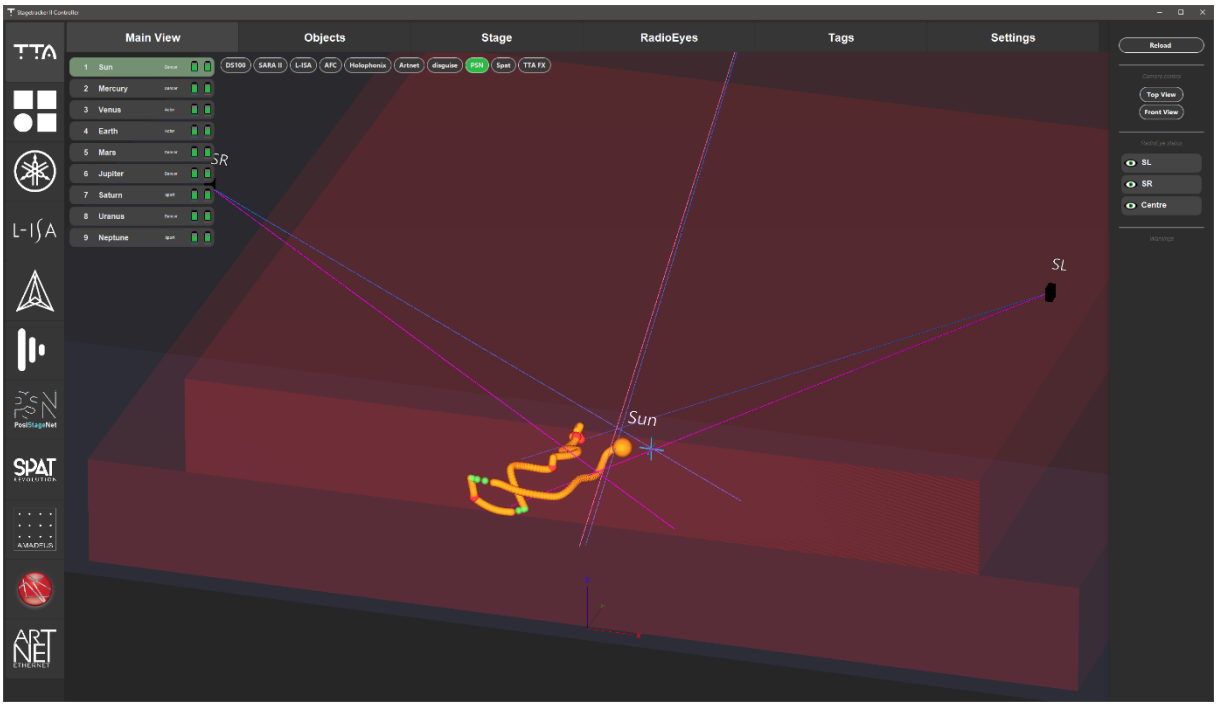
At the top of the screen there is several buttons to enable plotting for Vectors and the different output modules. Each output module has its own plotter in the Main View, allowing the User to monitor several outputs at once, given that the system is configured with more than one output module. The Stagetracker II™ system must be completely setup and configured for this function to work. On the right-hand side of the screen there is also an indicator to tell if the Stagetracker II™ system can communicate with the Stagetracker II™ RadioEyes. It is required that the Stagetracker II™ RadioEyes are connected and configured in the RadioEyes tab for this to work.

The 3D plot can be manipulated with mouse input from the User. Left click and dragging rotates the view, right click and dragging moves the view, and using the scroll wheel (or pinch to zoom on multitouch compatible touchpads) zooms in and out of the view. In the top right-hand corner, there is shortcuts to Top view and Front view for quickly changing the view.



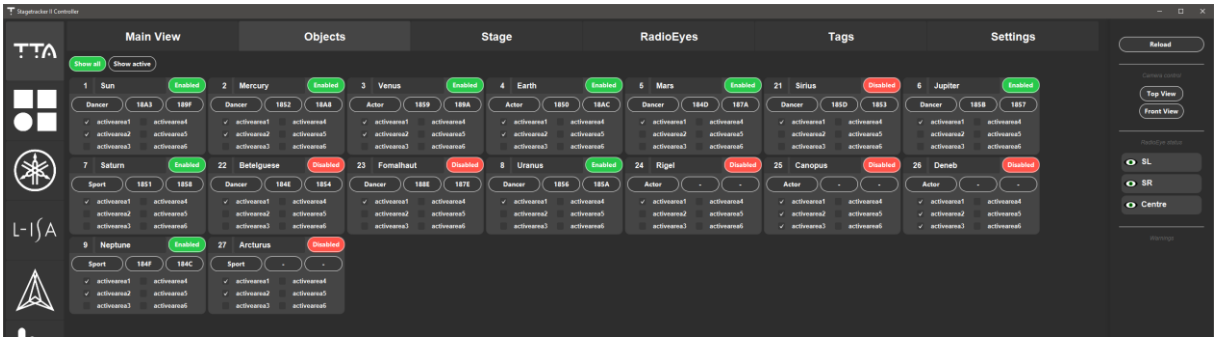
9.1.1 Solo mode

As of Stagetracker II™ software version 2.7.0 there has been added a functionality to enter “Solo mode” on an tracking object. This creates a trail of the positions from the last 10 seconds, as well as displaying the Vectors. To enter “Solo mode” simply left click with the mouse on the tracking object you want to inspect.

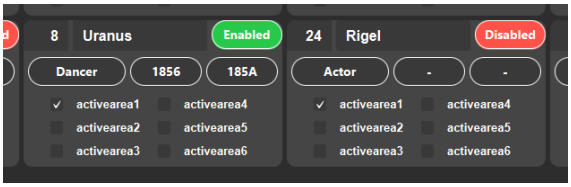


9.2 Objects

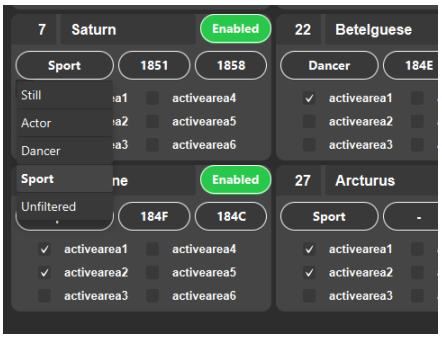
The Objects tab lists all the available Tracking Object slots that can be configured in the Stagetracker II™ system. The different parameters for the Tracking Objects relate to the Position Consumers parameters. E.g. the Tracking Object number often refers to the channel number of an audio processor.



Each Tracking Object must be assigned two Stagetracker II™ Tags. The User assigns the Stagetracker II™ Tags by clicking the button marked with a dash inside (or with a Stagetracker II™ Tag ID when reassigning) and picks the appropriate Stagetracker II™ Tag for the Tracking Object.



The User also must pick the appropriate Object type for the Tracking Object, e.g. Presenter or Dancer for the Stagetracker II™ system to behave properly. The different Object types have different properties to how they react to movement by the Tracking Object. E.g. the Presenter type expects less movements and tends to output smoother positioning data, as where the Dancer type expects a lot more movement, and quicker turns and higher speed. Consult your TTA representative or support@tta-sound.com for guidance if needed.



Lastly the User must configure Active Areas for each Tracking Object. This will ensure better tracking quality by only outputting positioning data to the output modules when the Tracking Object is inside the Active Area. Positions from outside the Active Area will not be sent to the output modules. Tick the different areas if these are known or use the one Active Area that is already enabled. Configuring Active Areas are covered in chapter 9.3 below. Remember to Enable the Tracking Objects by pressing the Enabled/Disabled button. The Enabled Tracking Objects can be filtered at the top of the window with the Show active/Show all button.

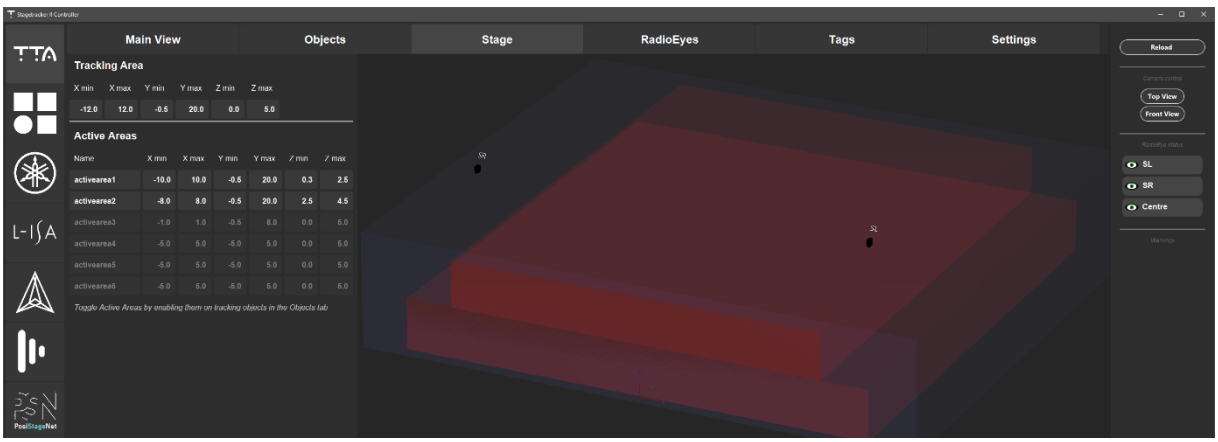
9.3 Stage

Configuration of the Tracking Area and the Active Areas takes place in the Stage tab. The Tracking Area is the area/volume that we allow the Tracking Objects to be positioned within. This will typically cover a bit more than the actual stage area, such as the crossover and the technical areas close to the actual stage area. All tracking data outside of the Tracking Area will be discarded by the Stagetracker II™ system. By restricting the Tracking Area, the Stagetracker II™ will be focused to the given area, and thus enhancing the performance to the focused area instead of trying to track the “whole world”. The Tracking Area should not include the Stagetracker II™ RadioEyes themselves.

The Active Area is the area in which the Stagetracker II™ system shall supply position information to the Position Consumers. The Active Area can be different for individual actors and for different Position Consumers. The position of the Tracking Object is still updated internally in the Stagetracker II™ system, but the Output Position is not changed until the Tracking Object enters an Active Area again.

To activate a new Active Area, go the Objects tab and select one or more of the needed Active Areas. The Active Areas can be modified and given friendly names before being assigned to a/several Tracking Objects. The Active Area will not be plotted in the 3D plot unless activated.

A good example where the Active Areas come in handy is when scenery covers more than one floor in the height, e.g. a balcony on a building upstage. Out of eight actors in a play, two of them will use a balcony during the play. By enabling the use of a new Active Area for those two actors in the Objects tab, the Stagetracker II™ system will only process and output positioning data calculated in that Active Area for those two actors, and not anyone else. This ensures that a potential reflection outside of the Active Area will not be processed for those actors that is not enabled to use that Active Area.

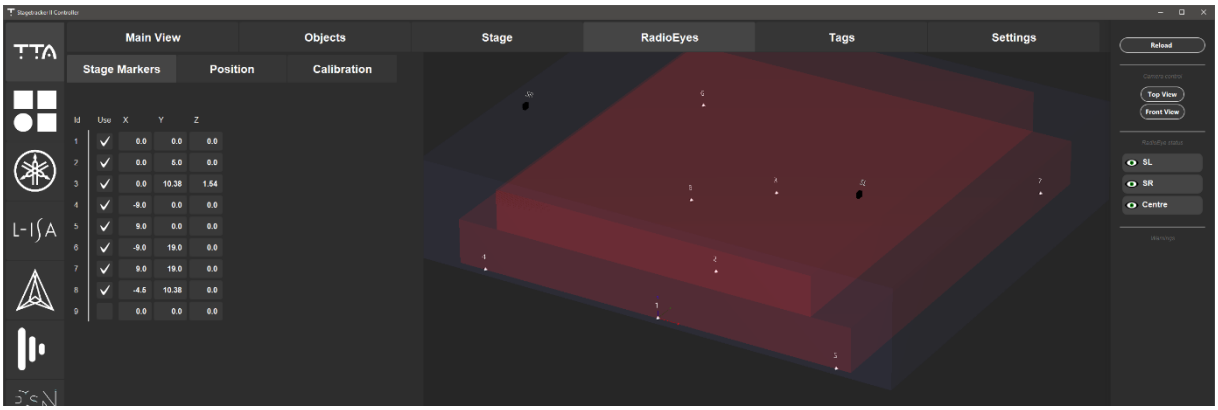


9.4 RadioEye

The RadioEye tab covers the most complex procedures during the Setup and configuration of the Stagetracker II™ system. In this tab there are grouped three tabs, Stage Markers, Positioning, and Calibration. All these three are related to each other and are to be made in the order mentioned. The complete procedure is described in this chapter.

9.4.1 Stage Markers

Stage Markers have a central role in the Positioning and Calibration process. It is therefore important to place these as precisely as possible. The Stage Markers in the Stagetracker II™ system are User defined and can very well be used with other equipment as well, or the other way around. The Stagetracker II™ system needs at least four Stage Markers spread across at least two axes to be able to Position and Calibrate.



The steps to define Stage Markers are as follows:

1. Find or define the point of origin (the place where all axes intersect, or more commonly known as the point of zero) on the stage. The point of origin can be anywhere on the stage however, TTA recommends that the User set the point of origin at the downstage-center position of the stage. This is the most used position for point of origin in most systems.
2. Define and lay out markers for at least four Stage Markers on the stage. The Stage Markers will later be used to Position and Calibrate the system, so be precise. The Stage Markers **must** be spread across at least two axes. Not doing so the Stagetracker II™ system cannot calibrate correctly. The X, Y and Z coordinates of the Stage Markers relate to the relative position to the point of origin. Remember to enable the Use checkbox after entering the X, Y and Z coordinates!

The outer most Stage Markers should define the Stage area and still be covered by the Stagetracker II™ RadioEyes. This ensures maximum quality of the Positioning and Calibration. E.g. a square covering the whole stage yields better positioning and calibration results than a small one in the center of the stage.

Tip: The point of origin is also a valid Stage Marker. Enter 0 in the X, Y and Z fields and enable the Stage Marker, and you already got one. The more, the better.

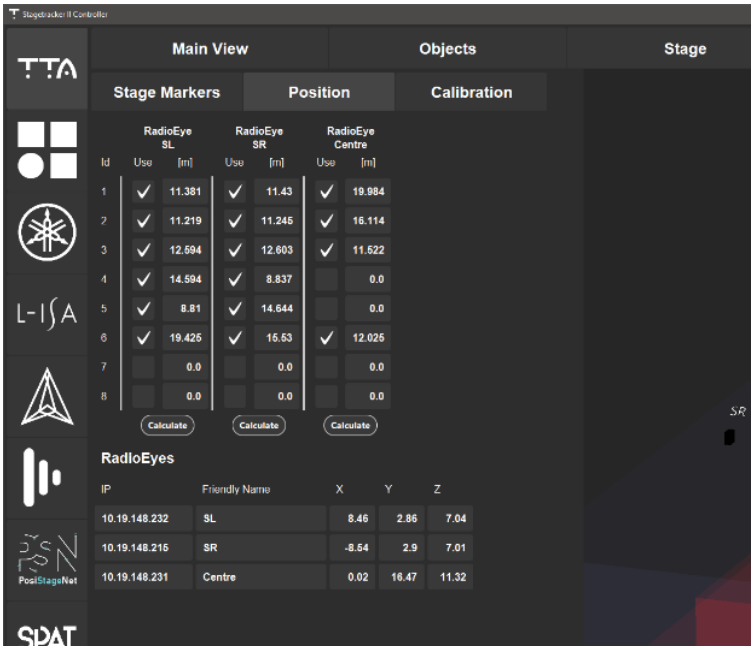
9.4.2 Position

Both Positioning and communication with the Stagetracker II™ RadioEyes are defined in this tab. Make sure to enter the correct IP address (found on the back of the Stagetracker II™ RadioEye) and give the Stagetracker II™ RadioEye a friendly name to easier identify them. The X, Y and Z coordinates for each Stagetracker II™ RadioEye are calculated using the Stage Markers defined in chapter 9.4.1 above and a laser rangefinder with the following procedure:

1. Use a laser rangefinder to measure the distance from Stage Marker ID #1 to all the Stagetracker II™ RadioEyes in the system. Aim for the center of the Stagetracker II™ RadioEye when measuring and enter the distance for the given Stagetracker II™ RadioEye in the correct field.
2. Repeat step 1 for each Stage Marker until all fields are filled. This process can be simplified using a laser rangefinder with Bluetooth functionality. The process if as follows:
    a. Connect the laser rangefinder with Bluetooth to the computer running the Stagetracker II™ Controller. Refer to the documentation for your equipment on how to do this.
    b. Select the first Stagetracker II™ RadioEye field for Stage Marker ID #1.
    c. Measure the distance from Stage Marker ID #1 to the given Stagetracker II™ RadioEye and send the data from the laser rangefinder to the Stagetracker II™ Controller with the Bluetooth functionality. The text marker automatically enters the next field and will be ready for the next measurements.
    d. Repeat step a to c for the remaining Stage Markers and Stagetracker II™ RadioEyes.
3. With all distances measured the Stagetracker II™ system is ready for Positioning. Make sure all the Use checkboxes are enabled for the measurements intended for Positioning (every checkbox should be enabled in most use cases) and press the Calculate button for the first Stagetracker II™ RadioEye.

The Stagetracker II™ system does a calculation and prompts the User to verify the height of the given Stagetracker II™ RadioEye with a laser rangefinder. If the numbers match, press OK and the Stagetracker II™ system will enter the correct X, Y and Z coordinates for the given Stagetracker II™ RadioEye. If not, press Cancel and repeat the process of measuring distances. If necessary, the User might need to define more Stage Markers.

4. Repeat the process for the remaining Stagetracker II™ RadioEyes.



9.4.3 Calibration

The Stagetracker II™ system must be calibrated for accurate tracking. The Calibration procedure is carried out in three easy steps with the Stage Markers used in chapter 0 above, and a charged Stagetracker II™ Tag. The procedure is as follows:

1. Find a charged Stagetracker II™ Tag and identify it by the last four digits in the MAC address found on the opposite side of the TTA logo (see Figure 10). Press the Tag field and choose the Stagetracker II™ Tag to be used for Calibration. Enable the Calibration process by ticking the Enable checkbox.

Enable Large indicators to enlarge the quality indicators for each Stagetracker II™ RadioEye during the Calibration procedure for easier determination of quality from a distance.

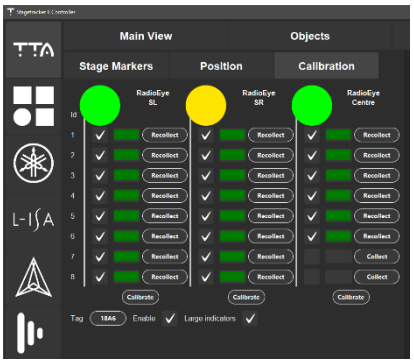
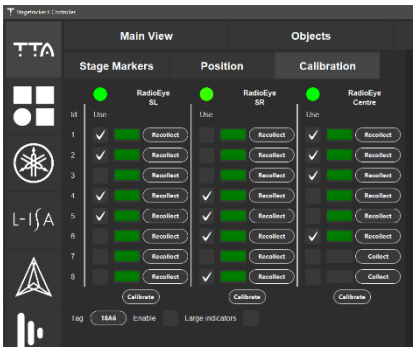


Figure 18 The indicators for RadioEye SL and Center are green and can be collected. RadioEye SR should be collected alone after rotating the Stagetracker II™ Tag

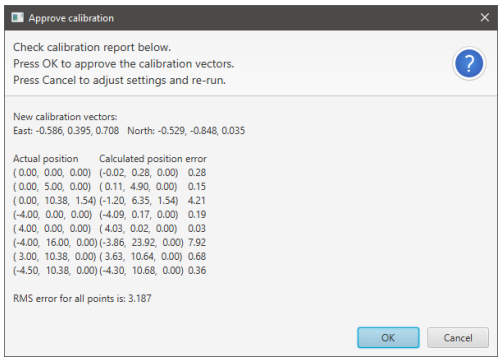
2. Place the Stagetracker II™ Tag on Stage Marker ID #1 with the TTA logo facing upwards. Rotate the Stagetracker II™ Tag until the quality indicator for one (or multiple) of the Stagetracker II™ RadioEyes turns solid green. Move away from the Stagetracker II™ Tag to avoid interference and press the Collect button for the Stagetracker II™ RadioEyes which indicators are green for Stage Marker ID #1. Repeat the procedure for all Stagetracker II™ RadioEyes and Stage Marker IDs. The button will say Recollect if there is data collected earlier.

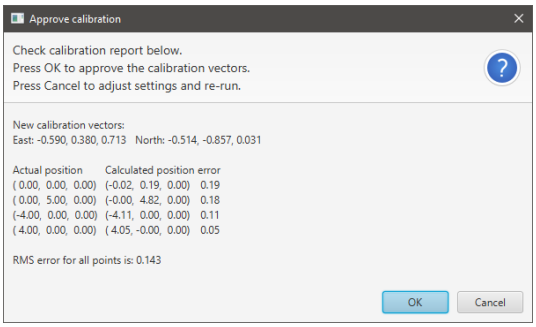
3. With all Stage Markers collected, press Calibrate for the first Stagetracker II™ RadioEye. A pop-up window displays the calculated calibration vectors, with the precision of each collection of data from step 2, and an RMS error value for all data collected for the given Stagetracker Ii™ RadioEye.

An RMS error value of less than 0.20m is acceptable, less than 0.10m is great, and less than 0.05 is exceptional.



4. Press OK to use the calculated Calibration and apply it to the Stagetracker II™ system. If the RMS error value is not satisfactory, the User can choose to press Cancel and Recollect data using Step 2. It is possible that the Calibration procedure results in several mathematical solutions. Therefor it is good practice to evaluate different combinations of the collected data by disabling and enabling the Use checkboxes.

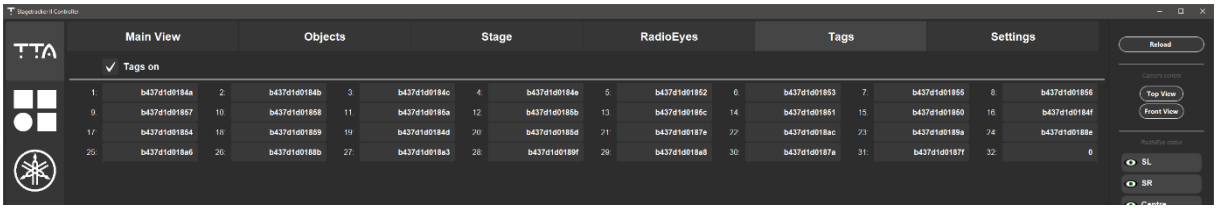




The Stagetracker II™ system is now calibrated and ready for use. See chapter 10 for setup of the individual output modules.

9.5 Tags

The Tags tab is intended for initial configuration of the Stagetracker II™ systems inventory of Stagetracker II™ Tags. The User enters all MAC addresses for every Stagetracker II™ Tag to be used with the Stagetracker II™ system, to allow coordination of internal components and be available to the User for assigning the Stagetracker II™ Tags to Tracking Objects in the Objects tab. There is also a handy All Tags Off switch to allow the User to power down all Stagetracker II™ Tags in vicinity to save power.



All Stagetracker II™ systems are delivered with a show file populated with the Stagetracker II™ Tags that comes with the initial shipment. Stagetracker II™ Tags sent after the initial configuration must be entered by the User in the Stagetracker II™ Controller.

To add a new Stagetracker II™ Tag to the Stagetracker II™ system select an empty field in the Tags tab and enter the complete 12-character long MAC address of the Stagetracker II™ Tag to be added.

To remove a Stagetracker II™ Tag from the Stagetracker II™ system select the field containing the MAC address for the Stagetracker II™ Tag to be removed and delete its contents.

The Stagetracker II™ system will need to Reload after both these operations.

9.6 Settings

The Settings tab holds all user accessible settings for the Stagetracker II™ system. Here the User can find functionality like raw data logging, fine tuning of tracking parameters and debugging tools (after consultation with TTA).

9.6.1 Signal processing and Max object speed

The parameters in this section should not be altered unless instructed by TTA.

9.6.2 Logging

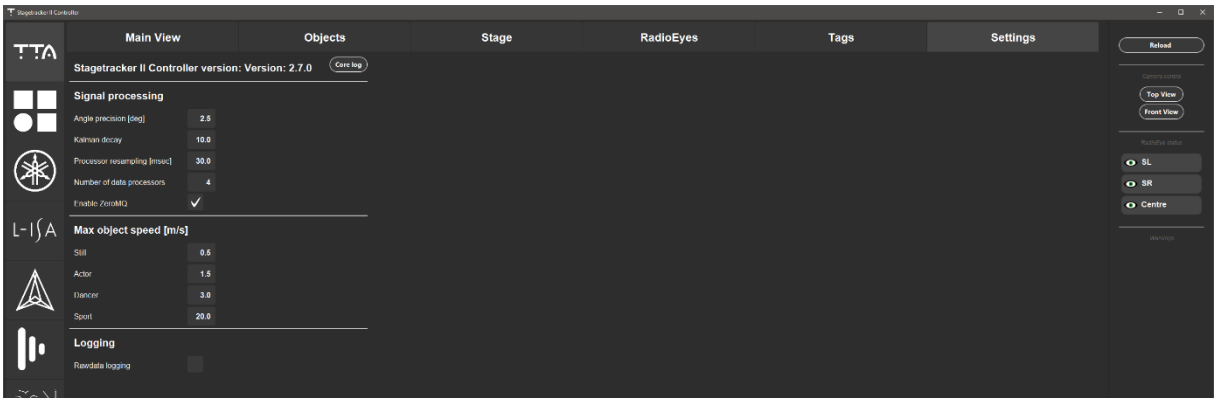
The logging section will be used to create raw data logs for TTA at analyse.

A raw data log will be created using the following procedure:

If possible, the User should record the whole process on a smartphone with a camera, or a handheld camera and attach this to the e-mail sent to TTA. This is for TTA to be able to see the ongoing action that matches the raw data log, and easier determine what causes the different movements in the analysis.

1. Go to the Settings tab and enable the Rawdata logging checkbox, and press Reload. When the Stagetracker II™ system has Reloaded the raw data logging has begun. If possible, start the camera recording before pressing the Reload button and point the camera at the computer screen until the Reload button has turned grey – then point it at the stage.
2. Perform the actions that causes the need for a raw data log, and if necessary, perform some additional actions as instructed by TTA. This is to ensure consistency in the raw data logs.
3. At the end of the time span of the intended raw data logging, go to the Settings tab and deselect the Rawdata logging checkbox, and press Reload. Once the Reload button has turned grey the raw data logging has finished. Please make sure to point the camera at the computer screen before Reloading and stop when it has turned grey.
4. Make a note of what causes the problem, or if there is a specific Tracking Object that needs to be analysed. Write this down either in a text file or in an e-mail.
5. Go to the Stagetracker II™ Core web panel by entering the IP address found on the touchscreen display of the Stagetracker II™ Core in a browser of choice.
6. Download the activated show file from the Show file section.

7. Find the Download raw data section, press the Dump file button and then Download. The raw data log will be downloaded to the computer.
8. Locate the downloaded files and send them to TTA along with the note from Step 4, and the video recorded (if applicable). The raw data logs tend to take up more space than the usual 25MB file size limit of e-mails, so the use of a third-party file sender/shared folder might be necessary.



10 Output modules

10.1 DS100 output module

This tab sets the parameters for the DS100 from d&b.

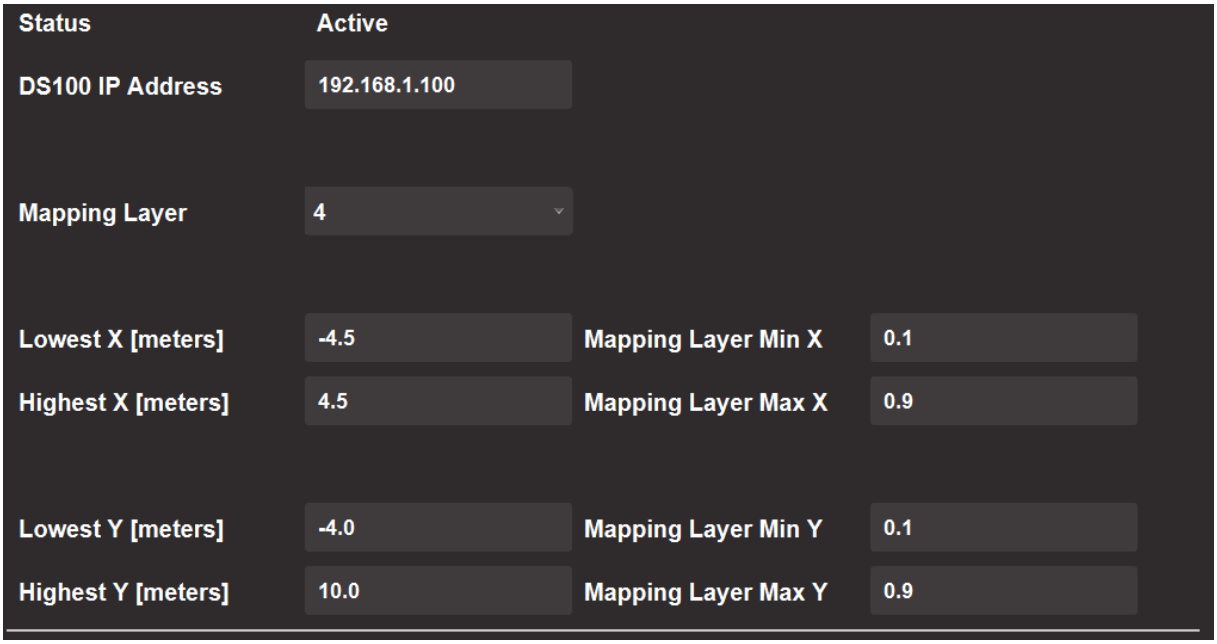


Figure 19 DS100 parameters

10.1.1 Basic parameters

Parameter	Default value	Description
DS100 IP Address	192.168.1.100	The IP address of the DS100
Sampling rate (Hz)	20.0	The sampling rate of tracking data sent to the DS100
Mapping layer	4	Which mapping layer in the DS100 the output is written to

10.1.2 Geometrical transformation

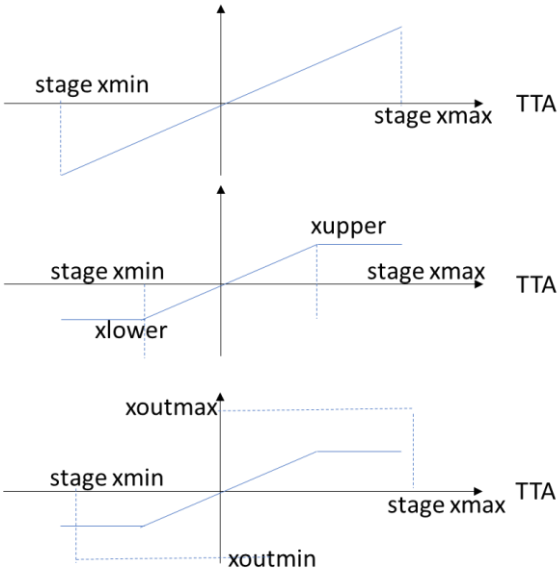


Figure 20 DS100 output module - geometric mapping

Parameter	Default value	Description
Lowest X	-4.5	Limits the X coordinates of the positions in the Stagetracker coordinate system
Highest X	4.5	
Output min X	0.1	Corresponding limits for the DS100 X coordinates
Output max X	0.9	
Lowest Y	-4.0	Limits the Y coordinates of the positions in the Stagetracker coordinate system
Highest Y	10.0	
Output min Y	0.1	Corresponding limits for the DS100 Y coordinates
Output max Y	0.9	

The input to the DS100 module is limited to the boundaries given by the stage and active area setup – whichever is smallest. In addition, one can limit the output further, by imposing smaller limits in the parameters “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

After this limiting, one can translate to a new coordinate, for instance 0 – 1, or 0.1 – 0.9, by setting the “Output min X”, “Output max X”, “Mapping layer min Y” and “Mapping layer max Y”. If no scaling is required, set these parameters to the same value as “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

10.1.3 Filter parameters

The DS100 module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.2 AFC output module

This tab sets the parameters for the AFC4 from Yamaha.

10.2.1 Basic parameters

Parameter	Default value	Description
IP address	127.0.0.1	The IP address of the AFC4
Port	8880	The network port used to communicate with the AFC4
Sampling rate (Hz)	20.0	The sampling rate of tracking data sent to the AFC4

10.2.2 Geometrical transformation

Scale and limit:

Parameter	Default value	Description
Lowest X	-5.0	Limits the X coordinates of the positions in the Stagetracker coordinate system
Highest X	5.0	
Output min X	-5.0	Corresponding limits for the AFC X coordinate
Output max X	5.0	
Lowest Y	-5.0	Limits the Y coordinates of the positions in the Stagetracker coordinate system
Highest Y	5.0	
Output min Y	-5.0	Corresponding limits for the AFC Y coordinate
Output max Y	5.0	
Lowest Z	0.0	Limits the Z coordinates of the positions in the Stagetracker coordinate system
Highest Z	2.0	
Output min Z	0.0	Corresponding limits for the AFC Z coordinate
Output max Z	2.0	

The input to the AFC module is limited to the boundaries given by the stage and active area setup – whichever is smallest. In addition, one can limit the output further, by imposing smaller limits in the parameters “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

Rotate and translate:

The different fields are variables in the equations for rotation and translation. Rotation has four variables, and translation has two. Value X and Y are the outputs from the scale and limit function.

Rotation equations:

$$x' = ax + by$$

$$y' = cx + dy$$

Translate equations:

$$x'' = x' + a$$

$$y'' = y' + b$$

10.2.3 Filter parameters

The AFC module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.3 L-ISA output module

This tab sets the parameters for the L-ISA from L-Acoustics.

Figure 21 L-ISA parameters

10.3.1 Basic parameters

Parameter	Default value	Description
Server	192.168.100.110	The address of the L-ISA

10.3.2 Filter parameters

The L-ISA module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.4 Sara II output module

This tab sets the parameters for the Sara II from Astro Spatial Audio.

Figure 22 Sara II parameters

10.4.1 Basic parameters

Parameter	Default value	Description
SARA II IP Address	192.168.100.135	The address of the Sara II

10.4.2 Geometrical transformation

Parameter	Default value	Description
Centre x	0	The coordinates of the Sara II point of origin.
Centre y	0	
Centre z	0	

10.4.3 Filter parameters

The Sara II module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.5 Disguise output module

This tab sets the parameters for the Disguise media servers.

10.5.1 Basic parameters

Parameter	Default value	Description
Sampling rate	20.0	The sampling rate of tracking data sent to the Disguise media servers

The PSN module outputs data in multicast, and therefore not needing to set an IP address.

10.5.2 Geometrical transformation

Parameter	Default value	Description
Lowest X	-5.0	Limits the X coordinates of the positions in the Stagetracker coordinate system
Highest X	5.0	
Output min X	-5.0	Corresponding limits for the Disguise X coordinate
Output max X	5.0	
Lowest Y	-5.0	Limits the Y coordinates of the positions in the Stagetracker coordinate system
Highest Y	5.0	
Output min Y	-5.0	Corresponding limits for the Disguise Y coordinate
Output max Y	5.0	
Lowest Z	0.0	Limits the Z coordinates of the positions in the Stagetracker coordinate system
Highest Z	2.0	
Output min Z	0.0	Corresponding limits for the Disguise Z coordinate
Output max Z	2.0	

The input to the Disguise module is limited to the boundaries given by the stage and active area setup – whichever is smallest. In addition, one can limit the output further, by imposing smaller limits in the parameters “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

10.5.3 Filter parameters

The Disguise module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.6 PosiStageNet (PSN) output module

This tab sets the parameters for the PosiStageNet protocol by VYV.

10.6.1 Basic parameters

Parameter	Default value	Description
Sampling rate	20.0	The sampling rate of tracking data sent to the PSN output

The PSN module outputs data in multicast, and therefore not needing to set an IP address.

10.6.2 Geometrical transformation

Parameter	Default value	Description
Lowest X	-5.0	Limits the X coordinates of the positions in the Stagetracker coordinate system
Highest X	5.0	
Output min X	-5.0	Corresponding limits for the PSN X coordinate
Output max X	5.0	
Lowest Y	-5.0	Limits the Y coordinates of the positions in the Stagetracker coordinate system
Highest Y	5.0	
Output min Y	-5.0	Corresponding limits for the PSN Y coordinate
Output max Y	5.0	
Lowest Z	0.0	Limits the Z coordinates of the positions in the Stagetracker coordinate system
Highest Z	2.0	
Output min Z	0.0	Corresponding limits for the PSN Z coordinate
Output max Z	2.0	

The input to the PSN module is limited to the boundaries given by the stage and active area setup – whichever is smallest. In addition, one can limit the output further, by imposing smaller limits in the parameters “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

10.6.3 Filter parameters

The PSN module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.7 Spat Revolution output module

This tab sets the parameters for the Spat Revolution from Flux:: Software Engineering.

10.7.1 Basic parameters

Parameter	Default value	Description
IP address	127.0.0.1	The IP address of the Spat Revolution
Port	57300	The network port used to communicate with the Spat Revolution.
Sampling rate (Hz)	20.0	The sampling rate of tracking data sent to the Spat Revolution

10.7.2 Filter parameters

The Spat Revolution module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.8 Holophonix output module

This tab sets the parameters for the Holophonix from Amadeus.

10.8.1 Basic parameters

Parameter	Default value	Description
IP address	127.0.0.1	The IP address of the Holophonix
Port	4002	The network port used to communicate with the Holophonix.
Output prefix		Defines the output prefix used to differentiate between types of audio tracks in the Holophonix
Sampling rate (Hz)	20.0	The sampling rate of tracking data sent to the Holophonix

10.8.2 Geometrical transformation

Scale and limit:

Parameter	Default value	Description
Lowest X	-5.0	Limits the X coordinates of the positions in the Stagetracker coordinate system
Highest X	5.0	
Output min X	-5.0	Corresponding limits for the Holophonix X coordinate
Output max X	5.0	
Lowest Y	-5.0	Limits the Y coordinates of the positions in the Stagetracker coordinate system
Highest Y	5.0	
Output min Y	-5.0	Corresponding limits for the Holophonix Y coordinate
Output max Y	5.0	
Lowest Z	0.0	Limits the Z coordinates of the positions in the Stagetracker coordinate system
Highest Z	2.0	
Output min Z	0.0	Corresponding limits for the Holophonix Z coordinate
Output max Z	2.0	

The input to the Holophonix module is limited to the boundaries given by the stage and active area setup – whichever is smallest. In addition, one can limit the output further, by imposing smaller limits in the parameters “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

10.8.3 Filter parameters

The Holophonix module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.9 TTA FX output module

This tab sets the parameters for the TTA FX from TTA.

10.9.1 Basic parameters

Parameter	Default value	Description
IP address	127.0.0.1	The IP address of the TTA FX
Sampling rate (Hz)	20.0	The sampling rate of tracking data sent to the TTA FX

10.9.2 Geometrical transformation

Centre:

Parameter	Default value	Description
Centre X	0.0	The offset measured in meter to define X
Centre Y	0.0	The offset measured in meter to define Y
Centre Z	0.0	The offset measured in meter to define Z

Scale and limit:

Parameter	Default value	Description
Lowest X	-5.0	Limits the X coordinates of the positions in the Stagetracker coordinate system
Highest X	5.0	
Output min X	-5.0	Corresponding limits for the TTA FX X coordinate
Output max X	5.0	
Lowest Y	-5.0	Limits the Y coordinates of the positions in the Stagetracker coordinate system
Highest Y	5.0	
Output min Y	-5.0	Corresponding limits for the TTA FX Y coordinate
Output max Y	5.0	

The input to the TTA FX module is limited to the boundaries given by the stage and active area setup – whichever is smallest. In addition, one can limit the output further, by imposing smaller limits in the parameters “Lowest X”, “Highest X”, “Lowest Y” and “Highest Y”.

10.9.3 Filter parameters

The TTA FX module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

10.10 ArtNet output module

The ArtNet output module is a simple interface to control lights via ArtNet.

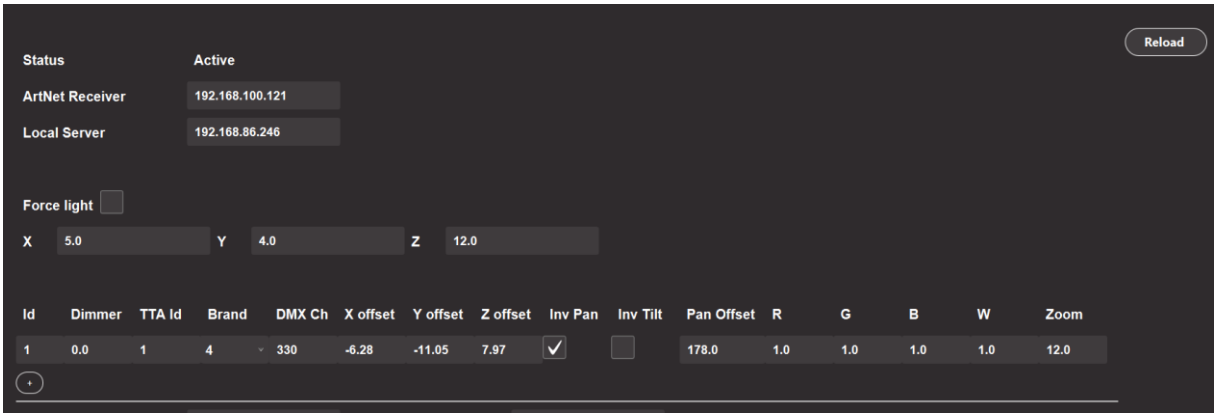


Figure 23 ArtNet parameters

10.10.1 Output objects

Parameter	Default value	Description
ID	N+1	Fixed numerical ID for each fixture
Use	Off	Toggle to enable the use of fixture
Dimmer	1.0	Dimmer value for fixture (0.0 – 1.0)
Num	1	Tracking Object ID
Brand	Martin Rush	The fixture library supported
DMX Ch.	1	The DMX channel for the fixture
R	1.0	Red output value (0.0 – 1.0)
G	1.0	Green output value (0.0 – 1.0)
B	1.0	Blue output value (0.0 – 1.0)
W	1.0	White output value (0.0 – 1.0)
Zoom	20.0	Zooms fixtures with zoom functionality (xx – xx)
X(def)	0.0	?
Y(def)	0.0	?
Z(def)	0.0	?

10.10.2 Output objects config

Parameter	Default value	Description
ID	N+1	Fixed numerical ID for each fixture
Use	Off	Toggle to enable the use of fixture
Dimmer	1.0	Dimmer value for fixture (0.0 – 1.0)
Num	1	Tracking Object ID
DMX Ch.	1	The DMX channel for the fixture
X	1.0	Position of the fixture measure in meter on the X axis
Y	1.0	Position of the fixture measure in meter on the Y axis
Z	1.0	Position of the fixture measure in meter on the Z axis
Inv Pan	Off	Toggle to invert pan value on output
Inv Tilt	20.0	Toggle to invert tilt value on output
Zero	0.0	?
Pan	0.0	Fixture pan correction?
Tilt	0.0	Fixture tilt correction?
Roll	0.0	Fixture roll correction?

10.10.3 Output configuration

Parameter	Default value	Description
ArtNet Receiver	127.0.0.1	The IP address of the ArtNet receiver, e.g. an ArtNet to DMX unit
Local Server (Core)	127.0.0.1	The IP address of the Stagetracker II™ Core.

The output can be forced to a position given by X, Y and Z. Enable the checkbox and enter the fixed position. This is a function mainly used for debugging.

A light pattern can also be sent to the output. Enable the checkbox next to Light pattern enabled and enter the four different positions for the light pattern to follow. Also used for debugging.

10.10.4 Filter parameters

The ArtNet module also contains a set of filter parameters.

These parameters shall not be changed from their default values unless after consulting TTA.

The TTA id is the Tracking Object the light shall follow.

The Brand is a number identifying the light. The Stagetracker support the following models of lights:

1	Martin Rush
2	Martin MAC Aura
3	Martin Viper
4	ADJ InnoSpot Pro
5	Generic