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Actor Live View



Actor List

The actor live view lists information about all actors in the current show. Each listed element contains the following data (from left to right):

- **Actor Color:** If an actor is online (i.e. the tag is actively transmitting), it's color (in form of a colored rectangle) is shown on the left (see [Add actors](#) on how to change this color).
- **DMX ID:** An actor's unique DMX id as specified in [Add actors](#).
- **Actor Name:** An actor's unique name as specified in [Add actors](#).
- **(Battery) status:** The text "online" indicates if an actor's tag is actively transmitting data. If available, a small icon also indicates the current battery level of a tag (green = (almost) full, yellow = medium level, red = almost empty).
Note: Battery levels are first shown a few minutes after a tracker comes online. There are also system setups that will always report the battery levels as unknown.

Click on an actor's row to change [individual live settings](#).

Sort by ...

Change the way the actor list is sorted (dmx id, name or transponder id).

Console

This button sets all actor channels (Height and Preset) to console mode.

(Individual) Actor Live Settings



By clicking on a specific actor's row in the actor list, you can adjust several of its live settings. Here is an example setting of Actor "zactag01"

Height

Adjust the height of a specific actor. If your system is configured for 2D tracking, this basically sets the z-position of an actor. If it is configured for 3D tracking, this is an offset that is added to the z-position received from an actor's tag. See [System Settings](#) on how to change the tracking mode.

If the checkbox Console isn't active, this setting can be set manually from the tablet. Otherwise, the value is automatically determined by listening to the light console on the actor's specified control channel (see [Add actors](#)).

Smart Beam

This feature is only visible if the checkbox in the Actor Setting is set.(see [System Settings](#)).

If the checkbox Console isn't active, this setting can be set manually from the tablet. If the feature is enabled, you can adjust the desired fixture beam diameter. The zactrack server will try to set the zoom/iris channels of fixtures assigned to this actor such that the beam diameter at the actor's tag position matches this value as closely as physically possible.

Note: For this feature to work accurately, the physical zoom/iris limits for assigned fixture types [has to be set correctly](#).

Speed Preset

Every fixture type has three different filter presets that result in different fixture behavior (see [Speed Presets](#)). Adjust this setting to specify the active speed preset of fixtures that are assigned to this actor.

If the checkbox Console isn't active, this setting can be set manually from the tablet. Otherwise, the value is automatically determined by listening to the light console on the actor's specified control channel (see [Add actors](#)).

Freeze filter

If the checkbox Console isn't active, this setting can be set manually from the tablet. Otherwise, the value is automatically determined by listening to the light console on the actor's specified control channel (see [Add actors](#)).

(Un)assign Fixtures

The bottom part of the dialog lists all fixtures assigned to this actor.

Press the + button to assign a fixture, press the - button to the right of an assigned fixture to unassign it.

Note: Only fixtures that are set to console assignment can be assigned manually. Other fixtures can only be assigned directly from the light console.

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Actors

Each zacTag you want to use with zactrack has to be registered in the show editor

1. Go to section "Actors" in the Show Editor
2. Tap  to add a new actor
3. Type in the name of the actor and tap create
4. Type in a unique DMX value
Note: With this identification number you are able to assign this actor to a fixture on the console.
5. Type in the unique Tracking ID of the tag
6. Pick the appropriate input control universe to change target height and speed presets from the console
7. Pick a color to identify the tag in the live view
8. Use "Merge" to use multiple physical zacTags as one
Note: You are able to merge as many zacTags as you want.
9. Tap  and tap upload to server
NOTE: "Upload to server" will affect the current show
10.  shows successful upload



Name

Type in the name of the actor

DMX Value (1..255)

DMX Value of which the zacTag will be assigned from the console.

Example: DMX Value 1

Lighting console sends the DMX Value 1 → zacTag is activated and fixture will follow the position of this particular zacTag

Lighting console sends the DMX Value 0 → No zacTags activated → Fixture can be used as a standard fixture without tracking.

Tracking ID

Unique tracking ID of a zacTag. This ID is labeled on the back of each zacTag.

Control Universe

Input universe coming from the console

Channel # (1...512)

DMX start address of the patched zacTag fixture on the console

Color

Pick a random colour which represents the actor in the Live View

Merge

Toggle Merge to use multiple physical zacTags as one because of backup and steadiness reasons

Note: You are able to merge as many zacTags as you want.

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Actors view



Console

This button sets all actor channels (Height and Preset) to console mode.

Height

Speed preset

Smart zoom

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Add actors

Each zacTag you want to use with zactrack has to be registered in the show editor

1. Go to section "Actors" in the Show Editor
2. Tap  to add a new actor
3. Type in a name of the actor and tap create
4. Type in an unique DMX value
Note: With this identification number you are able to assign this actor to a fixture on the console (For more information go to: [Console patching](#))
5. Type in the unique Tracking ID of the tag
6. Pick the appropriate input control universe to change target height and speed presets from console
7. Pick a color to identify the tag in the live view
8. Use "Merge" to use multiple physical zacTags as one
Note: You are able to merge as many zacTags as you want.
9. Tap  and tap upload to server
NOTE: "Upload to server" will affect the current show
10.  shows successful upload



Name

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Lighting console sends the DMX Value 1 → zacTag is activated and fixture will follow the position of this particular zacTag

Lighting console sends the DMX Value 0 → No zacTags activated → Fixture can be used as a standard fixture without tracking.

Tracking ID

Unique tracking ID of a zacTag. This ID is labeled on the back of each zacTag.

Control Universe

Input universe coming from the console

Channel # (1...512)

DMX start address of the patched zacTag fixture on the console

Color

Pick a random colour which represents the actor in the Live View

Merge

Toggle Merge to use multiple physical zacTags as one because of backup and steadiness reasons

Note: You are able to merge as many zacTags as you want.

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Patch fixtures

Each individual fixture you want to control by zactrack has to be patched into zactrack. All standard channels of each fixture will be patched commonly with a DMX start address and an output universe which the DMX node listens to.

In addition zactrack enables the control of additional zactrack functions per fixture from the console. For more information and download of the fixture type go to [zactrack Fixture Types](#).

These additional zacFixtures will be also patched with a DMX start address and any preferred input universe.

Here is an example:



How to patch fixtures into zactrack

- Tap  in section "Fixtures" to add a new fixture
- Choose the appropriate fixture type in the dropdown menu
Note: If the appropriate fixture type is not listed please [Import a fixture type](#) or [Create a custom fixture type](#)
- Choose the appropriate output universe for the fixtures you want to patch in the dropdown menu
Note: If the appropriate universe is not listed please [Add universes](#)
- Type in the DMX start address of the fixture you want to patch
- Choose the appropriate input universe (coming from the lighting console) for the fixtures you want to patch in the dropdown menu
Note: If the appropriate universe is not listed please [Add universes](#)
- Choose the appropriate input control universe (coming from the lighting console) for your fixtures you want to patch in the dropdown menu
Note: If the appropriate universe is not listed please [Add universes](#)
- Type in the DMX start address of your zactrack control channels for the first fixture you want to patch
- Type in the quantity of fixtures you want to patch
- Type in the fixture ID of the first fixture you want to patch
Note: zactrack numbers all patched fixtures sequentially.
- Tap OK to patch the fixtures



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Import a fixture type

- Tap on Fixture Types in the Show Editor
- Tap  to add a new fixture type
- Type in the name of your required fixture type to search through the fixture library
- Tap on the fixture type you want to add
- Set the appropriate [Speed Presets](#)
- Tap Ok
- Tap  and tap upload to server
Note: Upload to server will affect the current show
-  shows successful upload



[Create Custom](#)

[Create OSC](#)

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Add universes

- Go to Show Editor
- Tap  in section "Universes" to add a new universe
- Type in a unique name of the universe and tap on Create
- Choose Input or Output universe
- Choose ArtNet or sACN and type in the appropriate universe
 - **ArtNet**
 - Broadcast: 2.255.255.255
 - Unicast: Type in the ip address of the appropriate network listener (Ethernet/DMX Node)
Note: Universe starts at 0.0
 - **sACN**
 - Multicast
 - Unicast: Type in the ip address of the appropriate network listener (Ethernet/DMX Node)
- Toggle In Merge and choose the appropriate IN Universe if you have also additional fixtures patched in the universe which you don't use for following.
→ **All channels coming from this IN Universe will be rerouted to this created OUT universe**
- Tap Ok



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Additional hardware

Besides the specific zactrack hardware which is described [here](#) it is also necessary to use the following additional hardware to run zactrack.

- **PoE switch** to power and link all anchors into one network
 - Managed switch
 - >10W per port \\
 - Recommended products: <https://www.luminex.be/products/gigacore/>
 - **CAT6 ethernet cables** for the anchors and connections between switches
 - **Leica DISTO S910 incl. tripod head and tripod**
<https://lasers.leica-geosystems.com/disto/s910>
 - **WIFI Access Point** with the [this](#) configuration

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Adjust Auto-Functions

Besides pan and tilt zactrack automatically controls 4 additional fixture channels in relation to the distance between actor and fixture. These 4 channels are "Dimmer", "Iris", "Focus" and "Zoom". To program the auto functions you just "show" zactrack what to do. Point the light to a specific keyposition on the stage and adjust the channel settings as you desire. Store the settings for this keyposition and do so for at least 3 other points (or even more). As the actor now moves on the stage inbetween these keypositions the cahnel values will be smoothly interpolated.

- Go to the the fixtures section
 - Tap  next to the fixture you want to adjust the auto-function in the section "Fixtures"

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Advanced Settings

Reach this dialog via the [system settings](#).

Warning: These settings are only for advanced users! Changing any settings can lead to significant changes in the system's tracking behavior and may even disable tracking functionality entirely. Only make changes if you know exactly what you are doing!

Note: All of these options are only usable if there is an active connection to the zackrack server as indicated by the  symbol in the upper right corner. The configurations may appear empty and cannot be changed otherwise.



Allow Remote Maintenance

Checking this checkbox activates a mode that allows to maintain your system remotely.

Note: Only activate this if you really need to!

Network Configuration

Change the IP address and netmask of the Light Port of the Zackrack Server and if it is used from the Backup Server. It is necessary to restart the server. This can be done by clicking on the Ok Button, a confirmation is done by user.

System Config

Change the configuration file of the zackrack server. By changing/adding/deleting lines, several advanced system settings can be adjusted.

After changing this file, the zackrack server application will restart automatically.

The syntax for each line is:

```
property.name=value
```

Note: The lines have to match the above syntax EXACTLY in order to have any effect. Make sure that there are no spaces or '#' symbols anywhere. Double check for typos!

Here are examples for some of the most important properties:

PosiStageNet (PSN)

Change the port used for outgoing PosiStageNet communication:

```
network.psn.send.port=56565
```

Change the IP used for outgoing PSN communication:

```
network.psn.send.ip=236.10.10.10
```

Open Sound Protocol (OSC)

Change the port used for outgoing OSC communication:

```
osc.port=7777
```

Change the IP used for outgoing OSC communication:

```
osc.ip=192.168.0.205
```

Change the OSC address part before an actor's name:

```
osc.string=/zactrack/actor/
```

Change the OSC address part after an actor's name:

```
osc.string.post=/xyz
```

Send the DMX id of an actor as part of the OSC address instead of the full name:

```
osc.send_actorid=true
```

Change the OSC mode

```
osc.mode=1
```

Actors

Change actor control mode

0 .. 2 control channels 1 .. 5 control channels

```
actor.control.mode=1
```

Fixtures

Change fixture control mode

0 .. 2 control channels 1 .. 11 control channels

```
fixture.control.mode=1
```

Fixture Alignment Z Plus

```
fixture.alignment.only.z.plus=true
```

Fixture Offset

```
fixture.offset.factor=1
```

MISC OVERRIDES

```
debug.enabled=false  
client.show.advanced.filter=true
```

Set Default Show

This lets you define the current show as default show for the future.

System Log

Display system logs of the current session. This can be used to monitor system behavior and/or debug potential problems.

Restart zactrack Server

Manually restart the zactrack server application.

Note: This only restarts the application and does not reboot your server hardware!

Restart Tracking Server

Manually restart the tracking server application, which is responsible for all communication between anchors and tags.

Note: This only restarts the application and does not reboot your server hardware!

Factory Reset

Perform a complete factory reset. **This will irrecoverably delete the entire show history stored**

on the zactrack server and reset all **System Settings** to default values.

This will NOT affect system and tracking configuration files or anchor mappings!

Performing a factory reset will automatically restart the zactrack server.

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ALIGN

All fixtures you want to use as automated follow spots have to be accurately aligned into the defined coordinate system. zactrack computes the exact position and especially rotation of all fixtures regarding the defined origin by the alignment process. **Note: No need of any 3D model!**

- [Add universes](#)
- [Fixture Types](#)
- [Patch fixtures](#)
- [Align fixtures](#)



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ALIGN

All fixtures you want to use as automated follow spots have to be accurately aligned into the defined coordinate system. zactrack computes the exact position and especially rotation of all fixtures regarding the defined origin by the alignment process. **Note: No need of any 3D model!** Zactrack SMART has an alignment wizard, which makes it easy to align fixtures. 

- [Add universes](#)
- [Fixture Types](#)
- [Patch fixtures](#)
- [Align fixtures](#)



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Alignment

All fixtures you want to use as automated follow spots have to be accurately aligned into the defined coordinate system. zactrack computes the exact position and rotation of all fixtures regarding the defined origin by the following alignment process.

By aiming the beam of each fixture onto 4 calibration points, zactrack calculates the current position and rotation.

How to align the fixtures

Aim the fixture beam on 4 calibration points



1. Tap Alignment in section "Fixtures"
2. Tap Edit in the row of the fixture you want to align
3. Adjust the 4 parameters Dimmer / Iris / Zoom / Focus with the sliders on top to get the smallest and brightest possible beam of the fixture
Note: 4 different parameter presets can be stored by a long press on A, B, C or D on the right hand side
4. Aim the fixture beam roughly on the first calibration point
 1. by using the PAN / TILT touchpad on the tablet
 2. by using the lighting console and tapping Listen to Console
5. Tap on Fine at the top left corner of the PAN / TILT touchpad on the tablet
6. Center the beam on the first calibration point more precisely
 1. Manually by using the PAN / TILT touchpad on the tablet
 2. [Single Auto alignment](#)
 3. [Multiple Auto alignment](#)
7. Tap Save
8. Repeat the last 4 steps for the other 3 calibration points
Note: PAN & TILT values of all 4 calibration points should clearly differ to achieve accurate alignment results.
9. Tap Close

Calculate the position and rotation

- Tap Alignment in section "Fixtures"
- Center the beam of all fixtures you want use as follow spots on 4 measured calibration points as described above
Note: If you haven't measured the calibration points yet, please do so as described in [Measure Points](#)
- Select the fixtures you want to align by enabling the checkbox on the left hand side of the window
- Tap Start on the bottom right corner
Note: Tablet will BEEP after successful calculation and automatically download the result from the server

Green: Good alignment result

Yellow: Moderate alignment result

→ Check how accurate the beam is centered on the 4 calibration points

Red: Bad alignment result

→ Check how accurate the beam is centered on the 4 calibration points

→ Check if the fixture aims on the right calibration points and if all points are measured correctly

1. Tap Close
2. Tap  and tap upload to server
Note: Upload to server will affect the current show
3.  shows successful upload
4. Tap  in the fixture section next to the first aligned fixture → fixture has to point on origin 0,0
Note: If the fixture does not point on the origin please redo the alignment process!
5. Tap on Lock Y
6. Move the fixture along the X-axis by moving the finger from left to right and back using the touchpad. The movement has to picture a straight line on the X-axis
Note: If the movement does not picture a straight line please redo the alignment process!

Tip: You are able to speed up the movement by toggling on X10

Single Auto alignment

- [Aim the fixture beam roughly on the first calibration point](#) as described above



- Turn on the zactrack Puck and place it on the first calibration point
- Tap Auto
Note: Make sure “External Light Sensor” is enabled with the correct ip address in the System Settings
- Tap Start
Note: You can change the speed of the fixture movement by moving the slider left or right
- The beam of the fixture will be centered on the calibration point automatically
Note: Please take care that no external influences will affect the Auto alignment

Multiple Auto alignment

- Aim the fixture beam roughly on the first calibration point like described above
- Place the zactrack Puck right on the first calibration point
-  Tap Alignment in the section Fixtures
- Tap Align Multiple ... at the bottom
- Select the calibration point on which you want to align multiple fixtures by enabling the checkbox at the left hand side
Note: Make sure “External Light Sensor” is enabled with the correct ip address in the System Settings
- Tap Start
Note: You can change the speed of the fixture movement by moving the slider left or right
- The beam of all selected fixtures will be centered on the calibration point sequentially
Note: Please take care that no external influences will affect the Auto alignment

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Alignment SMART

All fixtures you want to use as automated follow spots have to be accurately aligned into the defined coordinate system. zactrack computes the exact position and rotation of all fixtures regarding the defined origin by the following alignment process.

By aiming the beam of each fixture onto 4 calibration points, zactrack calculates the current position and rotation.

How to align the fixtures

Using the Alignment Wizard

1. Tap Alignment Wizard in section "Fixtures"
2. Select the fixture to perform alignment
 - Press Next



- default nothing needs to be changed
- it is possible to use console data to position the light beam
- as default the 4 pucks are used for centering

ATTENTION you can move the Pucks to reach the light



- now the light output should be moved to the desired puck (4 times with 4 different pucks)
- you can see the luminous intensity



- the system does the auto refinement process

Note: Please take care that no external influences will affect the Auto alignment



- after the 4 refinement processes the system is calculating the position



- if an error occurred during this setup a message will show
 - In case of an error message check: [Something went wrong?](#)



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Ambersphere

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ANCHOR



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ANCHOR



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Auto 6M Use Full Console Range

There are two different ways of how the multipliers are calculated, depending on whether or not the advanced property in the [System Settings](#) is enabled or not.

Option 1: Property "Auto 6M Use Full Channel Range" is enabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_full_range_min** and **dmx_full_range_max** be the theoretical dmx value limits, **regardless of the limits set in the fixture's fixture type**. Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_full_range_min) /  
(dmx_full_range_max - dmx_full_range_min))  
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range [defined in its fixture type](#) (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **127** (50 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **255** (100 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).

Option 2: Property "Auto 6M Use Full Channel Range" is disabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_min** and **dmx_max** be the dmx limits [as specified in the fixture's fixture type](#). Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_min) / (dmx_max - dmx_min))  
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range [defined in its fixture type](#) (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of limited dmx range) from the lighting console leads to the final DIMMER value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).

- ...sending an IRIS value of **65** (50 % of limited dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **131** (100 % of limited dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).
- ...sending an IRIS value of **255** (195 % of limited dmx range) from the lighting console leads to the final IRIS value being **almost four times as big** as **auto_value** (due to the multiplier being **3.9**).

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Autofunctions

- Go to **Fixtures** in the show editor
- Tap Export AF to export the fixture positions for the autofunctions app
- Open the external [autofunctions app](#)
- [Set the desired dimmer, iris, zoom and/or focus zones inside the app.](#)
- Export the show from the autofunctions app.
- Go back to the zactrack 3 app
- Tap on Fixtures in the show editor
- Tap Import AF to import the autofunction file previously created with the autofunctions app
- Tap  and tap upload to server
Note: Upload to server will affect the current show
-  shows a successful upload



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Autofunctions APP



The autofunctions application can be used to define dimmer, iris, focus and/or zoom zones for individual fixtures and works in conjunction with the [zactrack 3 app](#).

The typical workflow is as follows:

- [Export autofunctions file from zactrack 3 app](#).
- [Import autofunctions file to autofunctions app](#).
- [Create autofunction scenes](#) and [define zones](#) using the autofunctions app.
- [Export autofunctions file from autofunctions app](#).
- [Import autofunctions file to zactrack 3 app](#).

SUB TOPICS

- [Overview](#)
- [Menu](#)
- [Create Autofunction Zones](#)
- [Manage Scenes](#)

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Define Autofunction Zones with the Autofunctions App

Autofunction zones define how certain fixture channel values (**DIMMER**, **IRIS**, **FOCUS** and/or **ZOOM**) are set based on the exact position of the actor that a specific fixture is assigned to. Note that autofunction zones do not have any affect if the fixture is not in [Auto 6 or Auto 6M merge mode](#).

Basically, a zone consists of a **surface spanned by several points**, called **autofunction points**. Each of these points contains the desired values for **DIMMER**, **IRIS**, **FOCUS** and **ZOOM** channels **at the point's exact position**. **Values inbetween points are interpolated**. If the tracked actor position is **outside** of the surface, the channel values of the surface point with **the smallest euclidean distance** to the actor position will be used.

A show can have multiple [autofunction scenes](#), each consisting of a **set of autofunction points**. In each scene, every single fixture's autofunctions zone consists of a **subset of these points**, each with **distinct channel values**.

The autofunctions app makes creating and editing autofunction zones for different scenes easy by providing an instant visualization of the defined zone surfaces and intuitive editor tools. See [Manage Scenes with the Autofunctions App](#) for information on how to manage scenes.



Select Fixtures

The right part of the screen contains a list with all the fixtures of the currently loaded show. Tap on a fixture to select it, which will highlight the corresponding icon in the viewport (if visible) and show the autofunction zones defined for that fixture.

Use the toggle **Fixture Multiselection** and the buttons **Select All / Deselect All** to (de)select multiple fixtures at once.

Pattern **Select** can be used to select all fixtures containing the text in the adjacent text field.

After selecting one (or multiple) fixtures with active autofunction zones, the displayed surface's color visualizes autofunction values **for a specific channel** at specific locations. You can change the currently visualized channel by using the **Dim**, **Iris**, **Foc** and **Zoom** toggles at the top of the screen.

Note: If you select multiple fixtures, the surface will only be displayed if all of the selected fixtures contain EXACTLY the same point subset with EXACTLY the same autofunction values. Otherwise, the application won't be able to determine which one of the different fixture zones you want to visualize.

Select Autofunction Points

1. Select **EDIT** in the top bar to enable **edit mode**. Selected points are highlighted in yellow.

Note: You can also select points in creation mode, but switching to edit mode makes accidental point creations due to imprecise tapping impossible.

2. Select a point by tapping on it or select multiple by using the selection box (hold and drag). Selected points are highlighted in yellow. Tapping on any empty space will deselect all currently selected points. Toggling **Point Multiselection** in the bottom bar disables this automatic deselection and allows you to add points to your selection with several independent select operations.

Points have **different colors** based on the current point/fixture selection:

- **White:** Point is not selected and is not in the subset of any selected fixture.
- **Green:** Point is not selected, but is in the subset of ALL selected fixtures.
- **Blue:** Point is not selected, but is in the subset of SOME (but not all) selected fixtures.
- **Yellow:** Point is selected.

Create Autofunction Point

- Select CREATE in the top bar to enable **creation mode**.
- Tap anywhere on the visualized grid to create an autofunctions point at that location.

Move Autofunction Point(s)

- [Select the points you want to move.](#)
- Use **drag and drop** gestures to uniformly **move** all selected points to a different location.

Delete Autofunction Point(s)

- [Select the points you want to move.](#)
- Tap on Delete Points in the bottom left corner.
- Confirm with YES to delete all selected points.

Add Point(s) To Fixtures

- [Select the fixtures you want to add the points to.](#)

- [Select the points you want to add.](#)
- Tap on Add To Fixture on the bottom of to add all selected points to the selected fixtures.

Remove Point(s) From Fixtures

- [Select the fixtures you want to remove the points from.](#)
- [Select the points you want to remove.](#)
- Tap on Remove From Fixture on the bottom of to add all selected points to the selected fixtures.

Change Autofunction Values For Point(s)

- [Select the fixtures whose autofunction values you want to change.](#)
- [Select the points whose values you want to change.](#)
- Adjust the **Dimmer**, **Focus**, **Iris** and **Zoom** sliders to the desired values or disable a channel's autofunctions entirely for this position by toggling the corresponding checkbox.

Note: If you want to disable autofunctions for a fixture's specific channel entirely, it has to be disabled on ALL autofunction points. Otherwise, the value will still be set based on the surface point with the smallest euclidean distance to the actor position.

- Tap Save Values to save the new autofunction values. The surface visualization will change accordingly.

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Manage Scenes with the Autofunctions App

Scenes are subsets of autofunction zones, each containing their own distinct autofunction points and values for fixtures of a show.

In order to manage scenes in the autofunctions app, click on the  button in the [main application view](#). This will bring up the **Scenes** dialog.



The dialog lists all available scenes stored in the currently loaded show file as well as their DMX ids.

Change the currently active scene

Select a scene and tap **Select** or simply double tap an entry to **change the currently active scene** and return to the main view.

Create a scene



- Click on **Create** to bring up the **Scene Creation** dialog
- Select an existing scene from the **Copy** dropdown menu if you want to create the new scene **as a copy of another one**. If you create a scene as a copy, it will contain exactly the same autofunction zones (only with different point numbers) as the source scene, but can be **edited independently**.
- Enter the **name** of the scene into the corresponding text field.
- Enter the desired **DMX ID** of the scene into the corresponding text field (see [Scenes](#) for more information about scene DMX IDs). **The entered DMX ID has to be unique and between 0 and 255.**
- Tap **Create** to create the scene.

Edit a scene



- Select the scene you want to edit and click **Edit** to bring up the **Scene Edit** dialog.
- Change **name** and/or **DMX ID** of the selected show. **The entered DMX ID has to be unique**

and between 0 and 255.

- Tap Save to save the changes.

Delete a scene

- Select the scene you want to delete and tap on De~~l~~
- Press YES on the confirmation dialog to delete the scene.

Warning: This will delete all autofunction scenes stored in that scene as well!

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Autofunctions App Menu

Press  on the [main screen](#) to open the menu.



- **New Show:** Create a new (empty) show.
Note: This will discard all (unsaved) changes!
- **Load Show:** Load a show file that was previously exported from either the zactrack 3 or the autofunctions app itself.
Note: This will discard all (unsaved) changes!
- **Save Show:** Export the current show to a file that can be imported either by the zactrack 3 or the autofunctions app itself.
- **Settings:** Change additional application settings.
- **Quit Application:** Close the autofunction application.

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Load Autofunctions Show File

Reach this dialog via the [menu](#).



- Select the show file from the dropdown menu.

Note: This list contains all files stored in the default autofunctions file path (/storage/emulated/0/zactrack/autofunctions/)

- Click LOAD.
- Confirm loading by clicking YES on the confirmation dialog

Warning: This will discard all (unsaved) changes in the currently loaded show!

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Save Autofunction Show File

Reach this dialog via the [menu](#).



- Enter the desired show file name into the text field.

Note: All files are saved to the default autofunctions file path (/storage/emulated/0/zacktrack/autofunctions/)

- Click SAVE.
- Confirm saving by clicking YES on the confirmation dialog

Warning: This will overwrite any previously stored files with the same name!

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Autofunctions App Settings

Reach this dialog via the [menu](#).



- **Zoom Sensitivity:** Determines how quickly the camera zooms in/out when using the pinch/zoom gesture in the [2D viewport](#).
- **Visualization Modes:** This setting can be used to disable certain, unneeded visualization modes entirely.
- **Load/Save Path:** This is the default file path used when [loading](#) or [saving](#) shows.

Warning: Do not change this value unless you know exactly what you are doing. This path is used by the zactrack 3 AND the autofunctions app and changing it can lead to autofunction file im-/exports not working correctly.

- **Background Alpha:** Currently unused feature.

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Autofunctions App Overview



Top Bar

Press  to open the [menu](#).

The two buttons CREATE and EDIT can be used to switch between different modes during the [creation of autofunction zones](#).

Use the toggles **Dim**, **Iris**, **Foc** and **Zoom** to switch between different [zone visualization modes](#).

2D Viewport

The largest portion of the autofunctions tool's user interface is a (2D) view port in the middle of the screen, showing labeled  **autofunction** and  **calibration point** as well as  **fixture positions** on a **1x1 meter grid**.

The **red line** represents the **x-**, the **green line** the **y-axis**.

Use the two checkboxes **Show Fixtures** and **Show CPs** to toggle the display of calibration point/fixture positions on/off.

Use common **pinch & zoom gestures** to **zoom in/out** and use the **scrolling gesture** to **move the camera**.

Press the  button to **rotate** the view by 90 degrees.

The **name of the current show** is (subtly) placed in the **top left corner**.

This part of the screen is also used to create autofunction zones for different fixtures. See [Define Autofunction Zones with the Autofunctions App](#) for more information.

Fixture List

The right part of the screen contains a list with all the fixtures of the currently loaded show. Tap on a fixture to select it, which will highlight the corresponding icon in the viewport (if available) and show the [autofunction zones](#) defined for that fixture.

Use the toggle **Fixture Multiselection** and the buttons **Select All / Deselect All** to (de)select multiple fixtures at once.

Pattern **Select** can be used to select all fixtures containing the text in the adjacent text field.

The button Scene: xx (x) shows the currently selected scene and can be clicked to [manage scenes](#).

Bottom Bar (Autofunction Point Controls)

The bottom bar contains controls used during autofunction zone creation and is explained in greater detail on [the dedicated subpage](#).

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BASIC PREPARATIONS

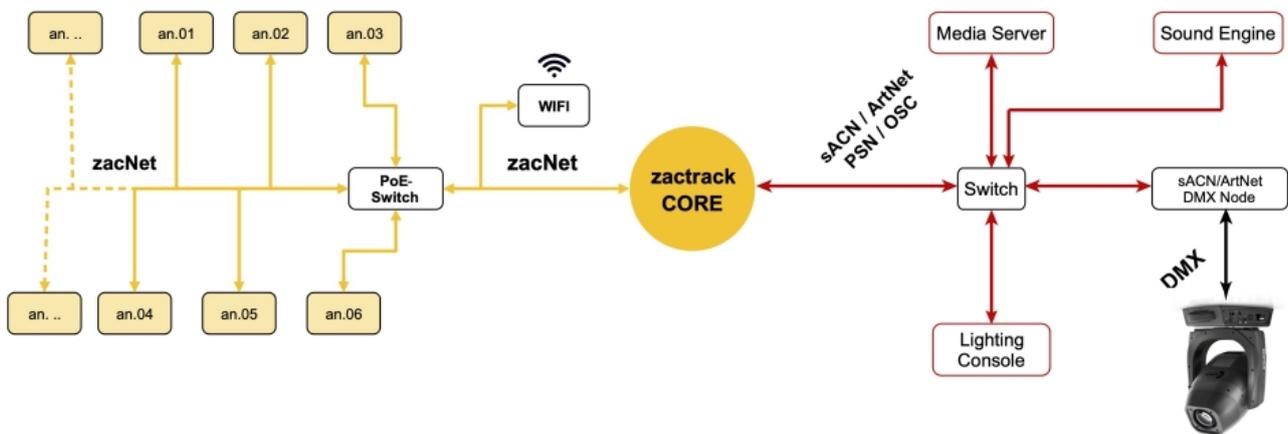
To operate a Zackrack System, some basic preparations are necessary.

Connect the Zackrack Server as seen in the lower picture. Each Anchor needs a POE supply. It is possible to use different switches. See also [Network](#)

Put the Trackers in the charging station and connect a 5V USB power supply. Wait until the trackers are fully charged (green constant light).

Also charge the 4 Pucks, with the USB cable. They are only necessary for a setup process.

Hardware Setup Overview

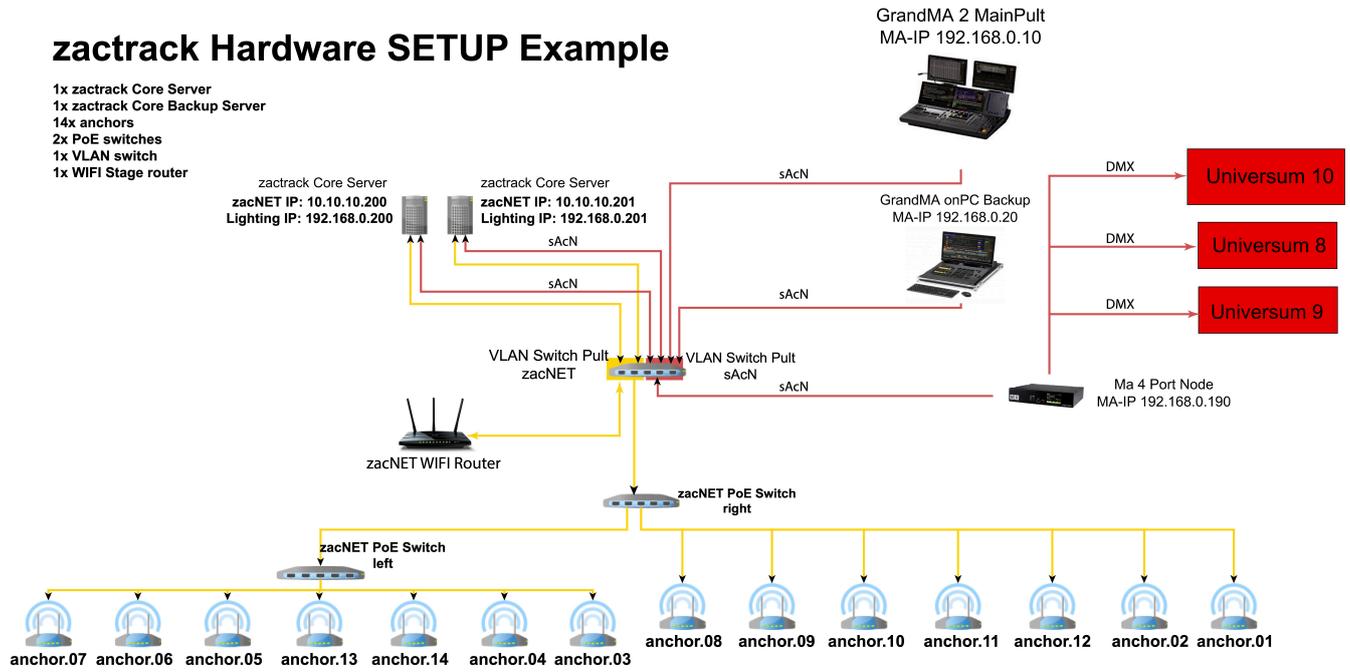


A zackrack Setup could look like this

In this example a Main and a Backup Server is used. **Attention a Zackrack Smart System is limited at 8 Anchors!**

zactrack Hardware SETUP Example

- 1x zactrack Core Server
- 1x zactrack Core Backup Server
- 14x anchors
- 2x PoE switches
- 1x VLAN switch
- 1x WIFI Stage router



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Define calibration points on stage

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https://manual.zactrack.com/doku.php?id=manual:calibration_points

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Calibration Setup

Define a coordinate system on stage

For a tracking system it is essential to create an absolute coordinate system where all actors and fixtures refer to. Define a zero point and the corresponding directions of the x and y axis. It is recommended to choose the directions of the axis parallel to the stage (Ideally take an existing stage coordinate system). The z axis points up per definition.

Define calibration points

Define fixed calibration points at the corners around the stage in numerical order and one in the center of the stage. Apply yellow labels to mark the fixed calibration points. These calibration points will be used to align the fixtures with the coordinate system.



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CHARGER



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CHARGER



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Client Overview

- [Connect the client to zactrack CORE](#)
- [Upload / Download Show](#)
- [Menu](#)
- [SHOW EDITOR](#)
- [LIVE](#)

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Permanent link:
https://manual.zactrack.com/doku.php?id=manual:client_overview

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Connect the client to zacktrack CORE

1. Make sure the WIFI router is connected to zacNET

Note: Please make sure you have set up the WIFI router correctly
→ **Set up the WIFI network**

2. Connect the zacktrack tablet to the wifi network called "zacktrack" (take the password from your login sheet)
3. Open the zacktrack APP on the tablet
4. Tap  on the top right corner to type in the zacktrack CORE ip address
5. Enter zacktrack CORE ip address (Standard IP: 10.10.10.200) and tap "OK"
6. If you are connected to zacktrack CORE, the server sign will show the following sign 



SUB TOPICS

- [SHOW EDITOR](#)
- [LIVE](#)
- [Settings](#)

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Connect ethernet

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Connect power

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Last update: **2018/07/26 16:38**



Connect zacktrack Puck to a WIFI network

If the LED shines continous blue search for a zacktrackPuck network on your device.



1. Connect your device to the network and wait for a few seconds.
2. A pop-up brings you to the zacktrackPuck config window. (You can type 192.168.4.1 in your browser to go there manually)



1. Press the  Button to scan for availabe networks.



1. List of all available networks (zacktrackCore standard → “zacktrack”)
 2. Credentials of chosen network
 3. zacPuck network settings (default settings should remain unchanged)
 4. Choose a network by pressing on it or entering the SSID. Put in the password an hit save.
- If your desired network is not shown you can hit the scan button to rescan or enter the SSID and password manually.**

If the configuration succeeded the following dialog comes up:



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https://manual.zacktrack.com/doku.php?id=manual:connect_zacktrack_puck_to_a_new_network

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Set up the lighting console

It is possible to set up the lighting console and the zacktrack CORE in 3 different setups depending on the conditions of the whole lighting network setup.

[Add](#) specific ZACFIXTURE channels on the lighting desk to control individual fixtures by zacktrack.

[Add](#) specific ZACTAG channels on the lighting desk to control the settings of individual actors.

Grand MA 2 ## \\

[DOWNLOAD](#) of prepared GRAND MA 2 / zacktrack Fixture Types

Lighting console setup 1

The lighting desk sends e.g. Universe 1 over sACN or ArtNet → zacktrack receives this Universe, manipulates the DMX channels according to the positions of the Actors and outputs the data on a new universe e.g. Universe 11 directly to the sACN / ArtNET DMX node.



Lighting console setup 2

The lighting desk sends e.g. Universe 1 over sACN or ArtNet → zacktrack receives this Universe, manipulates the DMX channels according to the positions of the Actors and outputs the data on a new universe e.g. Universe 11 back to the lighting desk.



Lighting console setup 3

The lighting desk sends e.g. Universe 1 Prio 100 over sACN → zacktrack receives this Universe, manipulates the DMX channels according to the positions of the Actors and outputs the data on the same universe e.g. Universe 1 Prio 101. The sACN / DMX node should always listen to the highest priority.

Note: zacktrack doesn't listen to its own universe output to prevent a sACN loop.



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Console patching

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Define a coordinate system on stage

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https://manual.zactrack.com/doku.php?id=manual:coordinate_system

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Create a custom fixture type



1. Tap on Fixture Types in the Show Editor
2. Tap to add a fixture type
3. Tap on create custom in the top right corner
4. Type in the name of the new fixture type
5. Tap Ok
6. Fill in the appropriate fixture type settings
7. Set the appropriate [Speed Presets](#)
8. Tap Ok
9. Tap and tap upload to server
Note: Upload to server will affect the current show
10. shows successful upload

Name

Type in the name of your custom fixture type

Short Name

Type in a short name of your custom fixture type. This short name will be used as a default fixture patch name.

Fixture Type

Choose the appropriate fixture type of your custom fixture type in the drop down menu

channels

Type in the number of channels of your custom fixture type

PAN / TILT / DIMMER / ZOOM / FOCUS / IRIS

Note: To get - → Double tap on the button . -

The pictures below show an example of a custom build fixture





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Create an OSC fixture type



- Tap on Fixture Types in the Show Editor
- Tap  to add a fixture type
- Tap Create OSC in the top right corner
- Type in the name of the new fixture type
- Tap Ok
- Fill in the appropriate OSC settings
- Set the appropriate [Speed Presets](#)
- Tap Ok
- Tap  and tap upload to server
Note: Upload to server will affect the current show
-  shows successful upload

Name

Type in the name of your OSC fixture type

Short Name

Type in a short name of your OSC fixture type. This short name will be used as a default fixture patch name.

Destination

Set OSC unicast target IP Address and the used Port

Address String

The address string has the following structure:

/PRESTRING/NAMEorID/POSTSTRING/COORDINATES

PRESTRING can be chosen freely

POSTSTRING can be chosen freely

NAME or ID

- ACTORDMX (send the DMX ID of the assigned Actor)

- ACTORNAME (send the name of the assigned Actor)

- FIXTURENAME (send the name of the OSC Fixture)

- FIXTUREDESCRIPTION (send the Description of the OSC Fixture)

Mode

Set the outgoing data format:

- Absolute Millimeters (int)
- Absolute Meters (float)
- Absolute Round Meters (int)
- Range (open an advanced window)
- Grid 2D

Axis Output

Choose the order of the transmitting data

Send Mode

Send only on change

is only transmitting data if there is a change of the position

Coordinate System

If the desired OSC System has a different coordinate system, there is the opportunity to create a new coordinate System. [Anchor or CPs](#) can be used to set the new coordinate system.

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Define origin on stage

- Define an origin on stage (coordinate system on stage) 

**Note: zactrack uses a right handed cartesian coordinate system.
X+ and Y+ axis are located on the floor and Z+ axis looks into the ceiling.**

The origin can be chosen freely anywhere on stage. It is recommended to align the X or Y axes parallel to the stage. Usually downstage center is a common origin with an X+ axis orientation towards stage right parallel to the stage. Y+ axis looks upstage and Z-axis looks into the ceiling.



- Mark the defined origin visible with a sticker or a tape
- Mark the direction of the positive X-Axis by sticking a tape or a sticker somewhere along the x+ axis.
- [Set up the LEICA Disto S910](#)
- Go to Show Editor and tap Define in the Points Section
- Tap Disto and aim the laser of the Leica Disto S910 on the marked origin
- Tap Measure
Note: Tablet will BEEP after successful measurement
- Tap Disto and aim the laser of the Leica Disto S910 on the X+ axis mark
- Tap Measure
Note: Tablet will BEEP after successful measurement
- Tap Ok
- Tap Set
Note: You'll loose all previous measurements!
- Now you are ready to [Measure Points](#)



RELATED TOPICS

- [Relocate measuring tool](#)
- [Validate Points](#)
- [Measure Points](#)

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Define origin on stage

- Define an origin on stage (coordinate system on stage) 

**Note: zactrack uses a right handed cartesian coordinate system.
X+ and Y+ axis are located on the floor and Z+ axis looks into the ceiling.**

The origin can be chosen freely anywhere on stage. It is recommended to align the X or Y axes parallel to the stage. Usually downstage center is a common origin with an X+ axis orientation towards stage right parallel to the stage. Y+ axis looks upstage and Z-axis looks into the ceiling.



- Mark the defined origin visible with a sticker or a tape
- Mark the direction of the positive X-Axis by sticking a tape or a sticker somewhere along the x+ axis.
- [Set up the LEICA Disto S910](#)
- Go to Show Editor and tap Define in the Points Section
- Tap Disto and aim the laser of the Leica Disto S910 on the marked origin
- Tap Measure
Note: Tablet will BEEP after successful measurement
- Tap Disto and aim the laser of the Leica Disto S910 on the X+ axis mark
- Tap Measure
Note: Tablet will BEEP after successful measurement
- Tap Ok
- Tap Set
Note: You'll loose all previous measurements!
- Now you are ready to [Measure Points](#)



RELATED TOPICS

- [Relocate measuring tool](#)
- [Validate Points](#)
- [Measure Points](#)

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Network DMX protocol

sACN (streaming ACN)

ACN (and streaming ACN) is an ANSI/ESTA international standard.

For additional information about this protocol please read:

http://en.wikipedia.org/wiki/Architecture_for_control_networks

Art-Net

Art-Net is a royalty free protocol developed by Artistic Licence

For additional information about this protocol please read:

<http://www.artisticlicence.com>

zactrack supports Art-Net 1, 2

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Downloads

JAR File

Client APK

Autofunctions APK

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Edit control universes

1. Tap on the universe you want to edit in section "Universes"
2. Edit the universe settings you want to change
3. Tap "Ok"



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Edit fixture type settings

1. Tap on the fixture type you want to edit
 - All Fixture Type Settings will automatically be loaded from the fixture library except filter parameters for slow, medium and fast



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https://manual.zactrack.com/doku.php?id=manual:edit_fixture_type_settings

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Export Show

You can export the current local show by tapping on the **Export Show** option in the [menu](#).



- Enter the desired file name into the text field. The default name contains the name of the current show as well as the current date and time.
- Choose between two show file formats:
 - **Zactrack Native:** Smaller, more efficient binary format that is not human-readable, but can be saved, loaded and transferred very easily.
Note: Always choose this format if human readability is not important.
 - **Json:** Bigger, less efficient, but human-readable format. **Note: Exported show files in this format cannot be reimported.**
- There are two ways of exporting your show file:
 - Click Save to save the file to the default zactrack show directory (***/storage/emulated/0/Zactrack/Shows***).
 - Click Share to share the file with any suitable application. By using appropriate software, this can be used to, e.g., store the file in an arbitrary location or upload it directly to Google Drive.

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PREPARATIONS

This section tells you what you have to prepare to use zactrack.

- [Set up the WIFI network](#)
- [Set up the LEICA Disto S910](#)
- [Set up the zactrack Puck](#)
- [Set up the lighting console](#)

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https://manual.zactrack.com/doku.php?id=manual:first_steps

Last update: **2020/04/20 10:28**



Fixture Groups



- Tap on Fixture Groups in the Show Editor
- Tap  to add a fixture group
- Type in the name of the new fixture group
- Toggle on all fixtures you want to add into the fixture group
- Tap Ok
- Tap  and tap upload to server
Note: Upload to server will affect the current show
-  shows successful upload

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Fixture Live View



Fixture List

The fixture live view lists information about all fixtures in the current show. Each list element contains the following data (from left to right):

- **Fixture Name:** A fixture's unique name as specified in [Patch fixtures](#).
- **Merge Mode/Assigned To:** The text on the right contains the current merge mode and, if available, the actor this fixture is currently assigned to.

Click on a fixture's row to change [individual live settings](#).

Console

This button sets all fixture channels (Assignment, Base Ch. Values, Merge Mode and Transition Time) to console mode.

Show Groups

If this option is checked, the fixture list shows [fixture groups](#) instead of individual fixtures. By clicking on a fixture group, live settings can be changed for all fixtures in this group simultaneously.

(Individual) Fixture Live Settings



By clicking on a specific fixture's row in the fixture list, you can adjust several of its live settings. If you clicked on a fixture group, then you can adjust live settings for all the fixtures in the group simultaneously.

Assignment

Change the **assignment mode** of the selected fixture. The following options are available:

- **Tablet:** This fixture is assigned to actors [directly from the tablet](#).

- **Console:** The fixture is assigned to actors automatically from the lighting console.

Base Ch. Values

Change the default base channel values of the selected fixture. These channel values will be sent to the fixture whenever a specific channel is not being set by any other system function (such as tracking or alignment). The following options are available:

- **Console:** Use the channel values received from the lighting console as default values.
- **Default:** Use the default channel function values of the fixture type (see [Create a custom fixture type](#)).
- **Min:** Use the values stored in the **DMX min** property of the fixture type as default values (see [Create a custom fixture type](#)).
- **Max:** Use the values stored in the **DMX max** property of the fixture type as default values (see [Create a custom fixture type](#)).
- **Highlight:** Use the values stored in the **Highlight** property of the fixture type as default values (see [Create a custom fixture type](#)).

Merge Mode

Change the [Merge Mode](#) of this fixture.

If the checkbox `Manual (Override Console)` is active, this setting can be set manually from the tablet. Otherwise, the value is automatically determined by listening to the light console on the fixture's specified control channel (see [Patch fixtures](#)).

Transition Time

Change the transition time of this fixture. If the transition time of a fixture is greater than zero, light cone repositioning due to actor assignment changes (re- or unassignment) happen smoothly instead of instantly. The transition time determines how long (in seconds) this smooth transition between two positions takes.

If the checkbox `Manual (Override Console)` is active, this setting can be set manually from the tablet. Otherwise, the value is automatically determined by listening to the light console on the fixture's specified control channel (see [Patch fixtures](#)).

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Fixture Types

To enable the patching of fixtures, they have to be created as fixture types. In the following picture is an example with different fixture types.



To add a new Fixture Type press the green plus

- [Import a fixture type](#)

To edit a Fixture Type press on the Name of it

- [Edit fixture type settings](#)

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Fixtures

This section describes how to integrate and control fixtures with zactrack.

- [Patch fixtures](#)
- [Alignment](#)
- [Scenes](#)
- [Autofunctions](#)



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Fixtures Assignment

Assignment of fixtures, adjustments of target height, speed parameters on tablet and live monitoring of active transponders and their movement data.

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Last update: **2018/07/26 16:38**



Fixtures view

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https://manual.zacktrack.com/doku.php?id=manual:fixtures_view

Last update: **2018/07/26 16:38**



FOLLOW

- Attach zactags on the actors
- Add [Actors](#) in the Show Editor
- Assign fixtures
 - [Manually from the tablet](#)
 - From the console → [Patch zactrack fixture types on the lighting console](#)
- Adjust target height and speed presets
- Adjust the [Freeze Filter](#)
- Set [Autofunctions](#)
- **FREEDOM TO MOVE**

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FOLLOW

- Attach the TRACKERS on the actors
- Add [Actors](#) in the Show Editor
- Assign fixtures
 - [Manually from the tablet](#)
 - From the console → [Patch zactrack fixture types on the lighting console](#)
- **FREEDOM TO MOVE**

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https://manual.zactrack.com/doku.php?id=manual:follow_smart

Last update: **2022/10/31 12:04**



GrandMa 2 / zactrack Fixture Types

FIXTURE

zactrack_zacfixture_v3.11_standard.xml.zip

zactrack_zacfixture_v3.15_update_standard.xml.zip

zactrack_zt_fixture_3.16_.xml.zip

TRACKER

zactrack_zactag_v3.11_standard.xml.zip

zactrack_zactag_v3.15_standard.xml.zip

zactrack_zt_tracker_3.16_.xml.zip

SCENE

zactrack_zacscene_v3.11_standard.xml.zip

zactrack_zacscene_v3.15_standard.xml.zip

zactrack_zt_scene_3.16_.xml.zip

From:

<https://manual.zactrack.com/> - **zactrack**

Permanent link:

https://manual.zactrack.com/doku.php?id=manual:grandma_zactrack_fixture_types

Last update: **2021/02/22 15:43**



Grid

From:

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Permanent link:

<https://manual.zacktrack.com/doku.php?id=manual:grid>

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Hardware

- [Hardware Overview](#)
- [Hardware Overview](#)
- [Hardware Setup](#)
- [Calibration Setup](#)
- [Set up the LEICA Disto S910](#)
- [PUCK](#)
- [ANCHOR](#)
- [SERVER](#)
- [CHARGER](#)
- [TRACKER](#)
- [PUCK](#)
- [ANCHOR](#)
- [SERVER](#)
- [CHARGER](#)
- [TRACKER](#)

From:

<https://manual.zactrack.com/> - **zactrack**

Permanent link:

<https://manual.zactrack.com/doku.php?id=manual:hardware>

Last update: **2020/04/22 12:13**



Hardware Overview

zactrack specific hardware



Anchor

Product number: z00101101



Material: ABS (IP 54)

Dimensions: 190 x 150 x 38 mm

Weight: 500 g

Power Supply: PoE (48V) - CAT6 compatible with Neutrik etherCON

Mounting: Aluminium Plate for Clamps incl. rig for safety line

Technology: Radio RTLS (Real Time Location System) based on Decawave DW1000

Accuracy: < 10 cm

Update Rate: 1 - 25 Hz

Connectivity: UWB (Ultra Wideband) channel 1 - 3, 3,5 - 4,5 GHz, 500 MHz bandwidth

Default radio channel: channel 3 / 4243.2 - 4742.4 GHz

Radio regulations: Ultra-Wideband worldwide radio regulations

https://www.decawave.com/sites/default/files/apr001_uwb_worldwide_regulations_summaryrev1.2.pdf

Channels and Bandwidths			
UWB Channel Number	Centre Frequency (MHz)	Band (MHz)	Bandwidth (MHz)
1	3494.4	3244.8 - 3744	499.2
2	3993.6	3774 - 4243.2	499.2
3	4492.8	4243.2 - 4742.4	499.2

Tracker (Transmitter)

Product number: z00102101



Material: ABS

Dimensions: 47 x 33 x 7,5 mm

Weight: 15,4 g

Battery Operating Time: → 4,5 hours in tracking mode / multiple days in standby mode

Charging: 2 hours (100%), 5V DC

Tracker Charger

Product number: z00102191
Material: ABS
Dimensions: 295 x 235 x 20 mm



zactrack Puck

Product number: z00107101
Material: ABS
Dimensions: 95mm Ø x 35mm
Weight: 200g
Battery: 2x AA → 12 hours



zactrack SERVER

Product number: z00109201
Case: 19-inch rack 1U, Half-length
Form Factor: 19" 1U chassis
Motherboard: X10SDV-TP8F
Dimensions: 43 x 437 x 249 mm
Gross Weight: 5 kg
Power Supply: 230VA with Input 100 - 240Vac, 91% efficiency
AC Input Frequency: 50-60Hz
Buttons: Power On/Off button, System Reset Button
LEDs: 2 Network Activity LEDs, Fan Fail/System Over Heat LED, HDD activity LED, Power Status LED
Ports: 1x VGA, IPMI, 4xLANs, 1x COM, 4xUSB, 1xKeyboard/Mouse

zactrack TABLET

Samsung Galaxy Tab S7 FE:
Dimensions: 18,5 x 28,48 x 0,63 cm
Screen: 12.4 Zoll, 16:9, 2560×1600, Multi-Touch
Wireless: WLAN 802.11a/b/g/n/ac, Bluetooth 4.2
Weight: 610g
Battery: 10090mAh,
Connector: USB-C

Samsung Galaxy Tab S8:
Dimensions: 16,53 x 25,38 x 0,63 cm

Screen: 11 Zoll, 16:9, 2560 x 1600, Multi-Touch,
Wireless: WLAN 802.11a/b/g/n/ac, Bluetooth 4.2
Weight: 503g
Connector: USB-C

Additional hardware

Besides the specific zactrack hardware it is also necessary to use the following additional hardware to run zactrack.

- **PoE switch** to power and link all anchors into one network
 - Managed switch
 - >10W per port
 - Recommended products: <https://www.luminex.be/products/gigacore/>
- **CAT6 ethernet cables** for the anchors and connections between switches
- **Leica DISTO S910 incl. tripod head and tripod**
(<https://lasers.leica-geosystems.com/disto/s910>)
- **WIFI Access Point** with [this configuration](#)

From:
<https://manual.zactrack.com/> - **zactrack**

Permanent link:
https://manual.zactrack.com/doku.php?id=manual:hardware_overview

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Hardware Overview

zactrack mini specific hardware



MASTER Anchor



Product number: z00309101



Material: ABS (IP 50)

Dimensions: 190 x 207 x 36 mm

Gross Weight: 680 g

Power Supply: DC 5.1V 3A

Battery: 3.7V, 5200mAh, Li-Ion battery (3h battery life, 3 hours charging time)

Ports: 1 LAN, 1 USB-C for Power, 1 XLR for DMX512 Output

Mounting: Rig mounting plate for clamp and safety line

Explanation of the numbering:

1. LED - Operation light
2. Screwing Attachment (1/4" inch thread for tripod)
3. LED - Power status
 - green: battery full
 - yellow: battery half full
 - red: battery <10%
 - red blinking: empty
4. Power button
 - Short press: show battery
 - Log press: switch ON / OFF
5. USB-C port
6. Ethercon port (LAN)
7. DMX port

Anchor



Product number: z00301101



Material: ABS (IP 54 - with closed USB-C connector)

Dimensions: 140 x 140 x 35 mm

Weight: 290 g

Power Supply: DC 5.1V 3A

Battery: 3.7V, 2600mAh, Li-Ion battery (16h battery life, 2 hours charging time)

Mounting: Rig mounting plate for clamp and safety line

Explanation of the numbering:

1. LED - Operation light
2. Screwing Attachment (1/4" inch thread for tripod)
3. LED - Power status
 - green: battery full
 - yellow: battery half full
 - red: battery <10%
 - red blinking: empty
4. Power button
 - Short press: show battery
 - Log press: switch ON / OFF
5. USB-C port

Tracker

Product number: z00302101

Material: ABS (IP65)

Dimensions: 35 x 60 x 10 mm

Weight: 26 g

Battery: 3.7V, 310mAh, LiPO battery

Battery Operating Time: 4 hours (active) / 20 hours (inactive)

Charging: 2 hours (100%), DC 5V 0.2A



Charging Station

Product number: z00203101

Material: ABS

Dimensions: 270 x 70 x 70 mm

Weight: 390 g

Connection: USB-C, DC 5V 1A



Disks

Material: ABS

Dimensions: 57 x 57 x 20 mm

Colors: Green, blue, red, and white



Additional hardware

Besides the specific zacktrack hardware it is also necessary to use the following additional hardware to run zacktrack MINI.

- **Android Tablet** necessary for setup process

Technology

Radio RTLS (Real Time Location System) based on Decawave DWM1001

Accuracy: < 10 cm

Update Rate: 15 Hz (Setting: 5 active trackers - depends on number of active trackers)

Connectivity: UWB (Ultra Wideband) channel 5 - 6,2 - 6,7 GHz, 500 MHz bandwidth

Default radio channel: channel 5 / 6,5 GHz

Radio regulations: Ultra-Wideband worldwide radio regulations

https://www.decawave.com/sites/default/files/apr001_uwb_worldwide_regulations_summaryrev1.2.pdf

Wi-Fi

Connectivity: 2.4GHz (channels 1 - 11) / 5GHz (channels 36, 38, 40, 44, 46, 48)

Default Frequency: 2.4GHz

Default Wi-Fi channel: channel 7

From:

<https://manual.zacktrack.com/> - **zacktrack**

Permanent link:

https://manual.zacktrack.com/doku.php?id=manual:hardware_overview_mini

Last update: **2022/11/10 17:57**



Hardware Overview

zactrack Smart specific hardware



SERVER

Product number: z00109201
Case: 9.5-inch rack 1U, Half-length
Form Factor: 9.5" 1U chassis
Dimensions: 260 x 230 x 44 mm
Gross Weight: 1,32 kg
Power Supply: 100-250VAC, 50-60Hz, 50VA
Display: User Information
Ports: 2xLAN, 1xUSB, 1xPowercon thru In- & Output



Anchor

Product number: z00101101
Material: ABS (IP 54)
Dimensions: 190 x 150 x 38 mm
Weight: 500 g
Power Supply: PoE IEEE802.3at & IEEE802.3af - CAT6 compatible with Neutrik etherCON
Mounting: Aluminium Plate for Clamps incl. rig for safety line



Technology: Radio RTLS (Real Time Location System) based on Decawave DWM1001
Accuracy: < 10 cm
Update Rate: 1 - 25 Hz
Connectivity: UWB (Ultra Wideband) channel 5 - 6,2 - 6,7 GHz, 500 MHz bandwidth
Default radio channel: channel 5 / 6,5 GHz
Radio regulations: Ultra-Wideband worldwide radio regulations
https://www.decawave.com/sites/default/files/apr001_uwb_worldwide_regulations_summaryrev1.2.pdf

Tracker

Product number: z00102101
Material: ABS



Dimensions: 47 x 33 x 7,5 mm

Weight: 15,4 g

Battery Operating Time: → 8 hours in tracking mode / multiple days in standby mode

Charging: 2 hours (100%), 5V DC

Charging Station

Product number: z00102191



Material: ABS

Dimensions: x x x x x mm

Connection: USB C, 5V 1A

zactrack Puck

Product number: z00107101



Material: ABS

Dimensions: Xmm Ø x Xmm

Weight: Xg

Battery: LiPo → 4 days under usage

Connection: USB C, UWB

Charging: 5V, 1.2A, 3 hours (100%)

Additional hardware

Besides the specific zactrack hardware it is also necessary to use the following additional hardware to run zactrack.

- **Android Tablet** necessary for setup process

Recommendations:

- **Samsung Galaxy Tab S7 FE:**
 - Dimensions:** 18,5 x 28,48 x 0,63 cm
 - Screen:** 12.4 Zoll, 16:9, 2560x1600, Multi-Touch
 - Wireless:** WLAN 802.11a/b/g/n/ac, Bluetooth 4.2
 - Weight:** 610g
 - Battery:** 10090mAh,
 - Connector:** USB-C
- **Samsung Galaxy Tab S8:**
 - Dimensions:** **16,53 x 25,38 x 0,63 cm**
 - Screen:** **11 Zoll, 16:9, 2560 x 1600, Multi-Touch,**
 - Wireless:** **WLAN 802.11a/b/g/n/ac, Bluetooth 4.2**
 - Weight:** **503g**
 - Connector:** **USB-C**

- * **PoE switch to power and link all anchors into one network**
- * **>5W per port * Recommended products:**
<https://www.luminex.be/products/gigacore/>
- * **CAT5e/CAT6/CAT7 ethernet cables for the anchors and connections between switches**
- * **WIFI Access Point to connect the tablet with the ZacNet**

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Hardware Setup



A zactrack Setup could look like this



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HARDWARE



- [PUCK](#)
- [ANCHOR](#)
- [SERVER](#)
- [CHARGER](#)
- [TRACKER](#)

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<https://manual.zactrack.com/> - **zactrack**

Permanent link:
https://manual.zactrack.com/doku.php?id=manual:hardware_smart

Last update: **2022/11/09 15:46**



Import Show

Reach this dialog via the [menu](#).



Import From Default Directory

- Click on a list entry to select a show file.
Note: The list contains all *.zts and *.json files in the default zactrack show directory (/storage/emulated/0/Zactrack/Shows).
- Click on Import to import the show stored in the selected file. **This will overwrite your current local show.**

Import From Any Directory

- Click on Import From... to open the default file browser on your tablet.
- You can now choose and import a valid show file (with *.json or *.zts extension) anywhere on your device. **This will overwrite your current local show.**

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<https://manual.zactrack.com/> - zactrack

Permanent link:
https://manual.zactrack.com/doku.php?id=manual:import_show

Last update: **2022/11/10 13:47**



Info

Reach this dialog via the [menu](#).

This screen shows the **version numbers** of the currently used zactrack server and zactrack client applications.



From:
<https://manual.zactrack.com/> - **zactrack**

Permanent link:
<https://manual.zactrack.com/doku.php?id=manual:info>

Last update: **2022/11/09 13:26**



Set the IP address in the zactrack CORE

From:

<https://manual.zactrack.com/> - **zactrack**

Permanent link:

<https://manual.zactrack.com/doku.php?id=manual:ip>

Last update: **2018/07/26 16:38**



LIVE

This section describes the three different areas on the application's LIVE screen.

- The [Actor Live View](#) lists all actors in the current show with additional status information. It can also be used to control various live settings for individual actors.
- The [Fixture Live View](#) lists all fixtures in the current show with additional status information. It can also be used to control various live settings for individual fixtures.
- The [Live Show Renderer](#) renders various live show elements as positioned in the zactrack coordinate system.



From:
<https://manual.zactrack.com/> - **zactrack**

Permanent link:
<https://manual.zactrack.com/doku.php?id=manual:live>

Last update: **2022/11/09 13:29**



Live Show Renderer



The live show renderer visualizes the position of anchors, calibration and autofunction points as well as tracked actors in a 1 x 1 meter grid of the current show coordinate system (including origin and axes). The **red** line represents the positive **x**- and the **green** line the positive **y-axis** of the current show.

The **checkboxes** on the bottom of the screen (or on the right in landscape mode) can be used to toggle the display of various elements:

- **Labels:** Toggle text labels on/off.
- **Traces:** Toggle actor traces on/off. If active, past positions of actors will be visualized in the form of traces. Use the dropdown menu to specify how much of an actor's history should be visualized (value in number of position data packets).
- **Anchors:** Toggle anchor positions on/off.
- **Auto Pos:** Toggle autofunction point positions on/off.
- **CP:** Toggle calibration point positions on/off.
- **Actors:** Toggle actor positions on/off.

Use the button to switch between **2D** and **3D render mode**. Use the buttons to **rotate** the current view by 90 degrees (only available in 2D mode!).

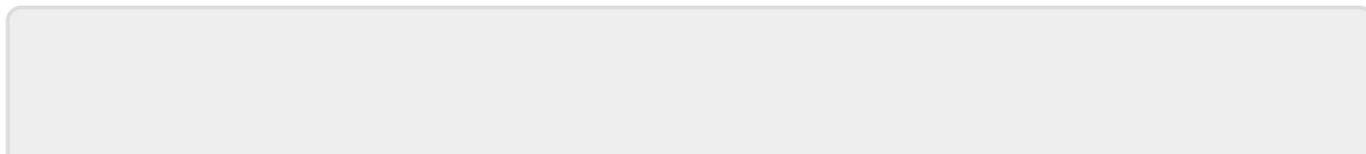
Change Active Scene

On the top of the show renderer, the currently active **scene** is displayed. Click on the text to change it.



If the checkbox `Manual (Override Console)` is active, this setting can be set manually from the tablet. Otherwise, the value is automatically determined by listening to the light console on the show's specified scene control channel (see [Show Settings](#)).

If manual scene selection is active, simply click on a row to make it the active scene.



From:
<https://manual.zacktrack.com/> - **zacktrack**

Permanent link:
https://manual.zacktrack.com/doku.php?id=manual:live_show_renderer

Last update: **2022/11/09 13:31**



Live viewer

From:

<https://manual.zacktrack.com/> - **zacktrack**

Permanent link:

https://manual.zacktrack.com/doku.php?id=manual:live_viewer

Last update: **2018/07/26 16:38**



Manual

You can view the zactrack manual by tapping on the **Manual** option in the [menu](#).

Note: This option is not available on all systems.

Note: Viewing the manual requires an active connection to the zactrack server, as indicated by the  symbol in the upper right corner.



- Click on Open Manual to open the manual.
- The manual will now be opened using the default internet browser application of your tablet.

From:
<https://manual.zactrack.com/> - **zactrack**

Permanent link:
<https://manual.zactrack.com/doku.php?id=manual:manual>

Last update: **2022/11/11 10:36**



MEASURE

- [Set up the LEICA Disto S910](#) 
- [Define origin on stage](#)
- Measure all anchor coordinates
[Measure Points](#)
- Measure all cp (calibration points) for the fixture alignment
[Measure Points](#)



From:
<https://manual.zactrack.com/> - **zactrack**

Permanent link:
<https://manual.zactrack.com/doku.php?id=manual:measure>

Last update: **2022/11/10 14:49**



Something went wrong?

In case of a failure or error Message, see follow suggestions.

Missing anchors

Check the light on the front panel.

blue : all ok

off : switched off / no power → plugin USB-C cable to charge and use the anchor

Calibration Result is bad

Check the anchor positions. Check if large equipment hides the anchor (loudspeakers, lamps,...).

Thin Materials are not a problem. See [MOUNT](#)



From:

<https://manual.zactrack.com/> - **zactrack**

Permanent link:

https://manual.zactrack.com/doku.php?id=manual:measure_mini_failure

Last update: **2022/11/09 13:03**



Measure Points

1. [Set up the LEICA Disto S910](#)
2. Tap  in section "Points" to add and measure a new point
3. Choose the type of points you want to add in the dropdown list

4. Tap Disto and aim the laser of the Leica Disto S910 on the first target you want to measure
5. Tap Measure
Note: Tablet will BEEP after successful measurement and jump to the next number automatically
6. Repeat the last 2 steps until all points are measured
Note: If you can't reach all points from this the current location please [Relocate measuring tool](#)
7. If all points are measured, tap Close
8. Tap  and tap upload to server
Note: Upload to server will affect the current show
9.  shows successful upload

RELATED TOPICS

- [Define origin on stage](#)
- [Relocate measuring tool](#)
- [Validate Points](#)

From:
<https://manual.zackrack.com/> - **zackrack**

Permanent link:
https://manual.zackrack.com/doku.php?id=manual:measure_points

Last update: **2022/11/10 13:52**



MEASURE

AUTO SYSTEM CALIBRATION

Zactrack Smart is able to perform a complete independent Measuring algorithm. It is a very easy and fast process. The system is performing a mesh ranging procedure and gets all distances between the zactrack components.

The zactrack resolver uses these informations and calculates the positions of the anchors according to the Puck positions. The Puck Positions define your coordinate system.

Open the Zactrack App and go to **Points**



Tap on the **System Calibration** button



You can choose between **Reinitialize System (Auto)** or **Reinitialize System (Measure)** or **Reposition Anchors (Auto)**

- Reinitialize System (Auto) will do a complete new Setup with a new coordinate System using Mesh ranging technology.
- Reinitialize System (Measure) will do a complete new Setup with a new coordinate System using Manual Measuring tool. Leica
- Reposition Anchors (Auto) will only reinitialize the position of the anchors and does no changes in the coordinate system.



The system lists all connected Anchors. If not check cable connections.

→ In case of an error message check: [Something went wrong?](#)



For the mesh ranging there have to be 4 points on the floor necessary. In default these four points are the pucks.

→ In case of an error message check: [Something went wrong?](#)



In the Advanced Mode it is possible to use other trackers for the system calibration.



The system guides you to position the four pucks.



The system is doing the Mesh ranging procedure.

→ In case of an error message check: [Something went wrong?](#)



After collecting the data the system is calculating the positions. The resolver tries to find the best solution. There can be more attempts and a lot of iterations



A green value means a good result.

→ If there is a yellow value ore an Error Message check: [Something went wrong?](#)



The anchor status are now red. Upload Show 



Successfully Set Up!

From:
<https://manual.zacktrack.com/> - **zacktrack**

Permanent link:
https://manual.zacktrack.com/doku.php?id=manual:measure_smart

Last update: **2022/11/09 12:51**



Something went wrong?

In case of a failure or error Message, see follow suggestions.

Missing anchors

Check the light on the front panel.

blue : all ok

red : POE power is good, no data -check cables or switch

off : no Power, check if the switch has POE capability and enough power, check cables

Calibration Result is bad

check the anchor postions. Check if large equipment hides the anchor.(loudspeakers, lamps,..)

Thin Materials are not a problem. See [MOUNT](#)

Fehlerbehandlung Messen

Pucks nicht in der Liste → Systemeinstellungen Pucks, Akku, einschalten

Fehler bei Mesh Ranging



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https://manual.zactrack.com/doku.php?id=manual:measure_smart_failure

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Menu

- Go to Show Editor in the zactrack 3 APP
- Tap on  in the top right corner to open the menu



- [New Show](#)
- [Import Show](#)
- [Export Show](#)
- [Show Settings](#)
- [System Settings](#)
 - [Advanced Settings](#)
- [Info](#)
- [Tracking Server](#)
- [Manual](#)

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Tracking Server

Reach this dialog via the [menu](#).

Note: Opening the tracking server web interface requires an active connection to the zactrack server, as indicated by the  symbol in the upper right corner.

- Click on Continue to open the web interface.
- The web interface will now be opened using the default internet browser application of your tablet (see [Tracking Server](#)).

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Merge actors

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https://manual.zactrack.com/doku.php?id=manual:merge_actors

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Merge modes

Fixture merge modes determine which channels (i.e. functions) of a fixture are controlled by the zactrack server during tracking mode and how much (if at all) they are influenced by input received from the lighting console.

Change the merge mode of fixtures in the [Fixture Live View](#). See [Create a custom fixture type](#) for information on different channel functions of fixture types.

Note: These settings only affect normal tracking mode. You will always be able to change the four channels DIMMER/IRIS/ZOOM/FOCUS (if available) while performing fixture alignments or setting up autofunctions.

Auto 2

In **Auto 2** mode, the zactrack server only adjusts the **PAN** and **TILT** channels of a fixture according to the actor's position during tracking mode. Other channels (including DIMMER, IRIS, ZOOM and FOCUS) have values according to the [Base Ch. Values](#) setting in the fixture live view.

Note that if you defined [autofunctions](#) for a fixture, they won't have any effect at all in Auto 2 mode.

Auto 6

In **Auto 6** mode, the zactrack server adjusts **PAN, TILT, DIMMER, IRIS, FOCUS** and **ZOOM** channels (if available) of a fixture while tracking an actor. Just like in Auto 2 mode, PAN and TILT values are determined by the actor's position. DIMMER, IRIS, FOCUS and ZOOM channels are set according to the fixture's [autofunctions](#) of the [currently active scene](#).

If the [smart zoom feature](#) is enabled for an actor, the ZOOM and IRIS channels will be set automatically, regardless of any autofunctions.

If there are no autofunctions defined for this fixture (and the smart zoom feature is disabled), the channels have the following default values:

- **DIMMER:** Full (e.g. DMX value of 255 for 8-bit or 65535 for 16-bit channels)
- **IRIS:** Half (e.g. DMX value of 127 for 8-bit or 32767 for 16-bit channels)
- **FOCUS:** Half (e.g. DMX value of 127 for 8-bit or 32767 for 16-bit channels)
- **ZOOM:** Half (e.g. DMX value of 127 for 8-bit or 32767 for 16-bit channels)

All other channels have values according to the [Base Ch. Values](#) setting in the fixture live view.

Auto 6M

Auto 6M mode works exactly like Auto 6 mode in that **PAN, TILT, DIMMER, IRIS, FOCUS** and **ZOOM** channels are determined by an actor's position, the fixture's active [autofunctions](#) and a potentially enabled [smart zoom](#). However, this mode allows the lighting console to have final control over the four channels **DIMMER, IRIS, FOCUS** and **ZOOM**.

The zacktrack application first calculates base values for these four channels according to the currently active autofunctions smart zoom settings, just like in Auto 6 mode. Before sending these values to the fixtures, however, the application takes the channel values received on a fixture's **input universe** (if defined) and uses them as **multipliers** in order to calculate the final output value.

All other channels have values according to the [Base Ch. Values](#) setting in the fixture live view.

Auto 6M Use Full Console Range

There are two different ways of how the multipliers are calculated, depending on whether or not the advanced property in the [System Settings](#) is enabled or not.

Option 1: Property "Auto 6M Use Full Channel Range" is enabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_full_range_min** and **dmx_full_range_max** be the theoretical dmx value limits, **regardless of the limits set in the fixture's fixture type**. Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_full_range_min) /  
(dmx_full_range_max - dmx_full_range_min))  
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range [defined in its fixture type](#) (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **127** (50 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **255** (100 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).

Option 2: Property "Auto 6M Use Full Channel Range" is disabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_min** and **dmx_max** be the dmx limits [as specified in the fixture's fixture type](#). Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_min) / (dmx_max - dmx_min))
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range [defined in its fixture type](#) (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of limited dmx range) from the lighting console leads to the final DIMMER value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **65** (50 % of limited dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **131** (100 % of limited dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).
- ...sending an IRIS value of **255** (195 % of limited dmx range) from the lighting console leads to the final IRIS value being **almost four times as big** as **auto_value** (due to the multiplier being **3.9**).

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Advanced Settings

Reach this dialog via the [system settings](#).

Warning: These settings are only for advanced users! Changing any settings can lead to significant changes in the system's tracking behavior and may even disable tracking functionality entirely. Only make changes if you know exactly what you are doing!

Note: All of these options are only usable if there is an active connection to the zacktrack server as indicated by the  symbol in the upper right corner. The configurations may appear empty and cannot be changed otherwise.



Allow Remote Maintenance

Checking this checkbox activates a mode that allows to maintain your system remotely.

Note: Only activate this if you really need to!

Network Configuration

Change the IP address and netmask of the zacktrack Master anchor's network port. Additionally, you can change the settings of the wifi access point hosted by the master anchor. You can change the following settings:

- your SSID,
- your password,
- the frequency, i.e., 2.4 GHz or 5 GHz,
- the channel within the frequency chosen, and
- if you want to hide your wifi/SSID.

When you choose to hide your wifi access point, the SSID will not be shown when your device scans for available wifis.

Note: If you customize your wifi settings and do not remember them, you can lock yourself out. However, you can still access the zacktrack master anchor via the network port.

Important: It is necessary to restart the server. This can be done by clicking on the Ok Button, a confirmation is done by user.

System Config

Change the configuration file of the zacktrack server. By changing/adding/deleting lines, several advanced system settings can be adjusted.

After changing this file, the zacktrack server application will restart automatically.

The syntax for each line is:

```
property.name=value
```

Note: The lines have to match the above syntax EXACTLY in order to have any effect. Make sure that there are no spaces or '#' symbols anywhere. Double check for typos!

Here are examples for some of the most important properties:

PosiStageNet (PSN)

Change the port used for outgoing PosiStageNet communication:

```
network.psn.send.port=56565
```

Change the IP used for outgoing PSN communication:

```
network.psn.send.ip=236.10.10.10
```

Open Sound Protocol (OSC)

Change the port used for outgoing OSC communication:

```
osc.port=7777
```

Change the IP used for outgoing OSC communication:

```
osc.ip=192.168.0.205
```

Change the OSC address part before an actor's name:

```
osc.string=/zactrack/actor/
```

Change the OSC address part after an actor's name:

```
osc.string.post=/xyz
```

Send the DMX id of an actor as part of the OSC address instead of the full name:

```
osc.send_actorid=true
```

Change the OSC mode

```
osc.mode=1
```

Actors

Change actor control mode

0 .. 2 control channels 1 .. 5 control channels

```
actor.control.mode=1
```

Fixtures

Change fixture control mode

0 .. 2 control channels 1 .. 11 control channels

```
fixture.control.mode=1
```

Fixture Alignment Z Plus

```
fixture.alignment.only.z.plus=true
```

Fixture Offset

```
fixture.offset.factor=1
```

MISC OVERRIDES

```
debug.enabled=false  
client.show.advanced.filter=true
```

Set Default Show

This lets you define the current show as default show for the future.

System Log

Display system logs of the current session. This can be used to monitor system behavior and/or debug potential problems.

Restart zactrack Server

Manually restart the zactrack server application.

Note: This only restarts the application and does not reboot your server hardware!

Restart Tracking Server

Manually restart the tracking server application, which is responsible for all communication between anchors and tags.

Note: This only restarts the application and does not reboot your server hardware!

Factory Reset

Perform a complete factory reset. **This will irrecoverably delete the entire show history stored on the zactrack server and reset all [System Settings](#) to default values.**

This will NOT affect system and tracking configuration files or anchor mappings!

Performing a factory reset will automatically restart the zactrack server.

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ALIGN

All fixtures you want to use as automated follow spots have to be accurately aligned into the defined coordinate system. zactrack computes the exact position and especially rotation of all fixtures regarding the defined origin by the alignment process. **Note: No need of any 3D model!** Zactrack MINI has an alignment wizard, which makes it easy to align fixtures. 

- [Add universes](#)
- [Fixture Types](#)
- [Patch fixtures](#)
- [Align fixtures](#)



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Alignment Mini

All fixtures you want to use as automated follow spots have to be accurately aligned into the defined coordinate system. zacktrack computes the exact position and rotation of all fixtures regarding the defined origin by the following alignment process.

By aiming the beam of each fixture onto 4 calibration points, zacktrack calculates the current position and rotation.

How to align the fixtures

Using the Alignment Wizard

1. Tap Alignment Wizard in section "Fixtures"
2. Select the fixture to perform alignment
 - Press Next



- In default mode nothing needs to be changed.
- It is possible to use console data to position the light beam
- As default the 4 trackers are used for centering
- **ATTENTION you can move the trackers to reach the light**
- There is no automatic refinement process in the zacktrack mini system.
 - If you want to refine the fixture alignment, you have to use your tablet.
 - **You have to activate the *Advanced Mode* and check *Automatic Refinement* is you want to use the refinement later!**



- Now the light output should be moved to the desired tracker (4 times with 4 different trackers).



- There is no automatic refinement process in the zacktrack mini system. This screen will only be shown, if you activated **Automatic Refinement** in the **Advanced Mode** beforehand.
- **Note: Please take care that no external influences will affect the Auto alignment**



- After you moved your light outputs to the 4 tracker positions, the positions of the fixtures are calculated.



- If an error occurred during this setup a message will show
 - In case of an error message check: [Something went wrong?](#)



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DISCOVERY

Before you can measure your anchors and calibrate your system, you have to discovery your anchors and trackers.

- Tap on the 3 dots in top right corner to open the menu (see [Menu](#) for details).
- Tap on the option **Tracking Server**.
- With the dialog popping up, you can discovery your anchors and trackers.



- Tap on the button **Discover Devices** to discover your trackers.
- Follow the instructions displayed in the wizard.
 - Turn on the anchors and tap *Next*.
 - Put the trackers you want to discover into the charging station. Make sure a USB-C cable is plugged into the charging station. The LED of the trackers you put in the charging station should either blink red or emit a constant green light.
 - Take the trackers out of the charging station after a few seconds and place them near the master anchor.
 1. The system can now discover the trackers within three minutes after you took them out of the charging station.
 2. Tap *Next* to discover the trackers.



The system tries to discover the anchors and trackers now.



- The system has finished the discovery process.
- The dialog will show you now how many unassigned trackers it discovered.
Note: Trackers that are already part of your show/configuration are not counted here.



- You have finished the discovery process of your anchors and trackers.
- You will return to the screen displayed in the first image on this page.
- Make sure that the system discovered all of your anchors and trackers.
- Make sure that all of your trackers and anchors have a correct firmware version.

Anchor is missing

If anchors are missing make sure that:

- you have switched them on (a LED should emit some light at the front of the anchor, and another one at the back).
- your anchors are charged. You can charged them with a USB-C cable at the back.
- your anchors are not blocked by other thing, e.g., fixtures, trusses, etc.

Tracker is missing

If trackers are missing make sure that:

- your trackers are charged. You can charged them with the charging station.
- your trackers are near the Master anchor during the discovery.
- nothing is in the Line-of-Sight between your trackers and the Master anchor.

Anchor Firmware invalid

- Tap on *Anchors* above the list displayed in the screen.
- Tap on the orange text *fw invalid*.
- Tap on the button **Update selected** to update the firmware of your anchors.

Tracker Firmware invalid

- Tap on *Trackers* above the list displayed in the screen.
- Tap on the orange text *fw invalid*.
- Tap on the button **Update selected** to update the firmware of your trackers.

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MEASURE

AUTO SYSTEM CALIBRATION

Zactrack mini is able to perform a complete independent measuring algorithm. It is a very easy and fast process. The system is performing a mesh ranging procedure and gets all distances between the zactrack components.

The zactrack resolver uses these information and calculates the positions of the anchors according to the calibration points' positions. The positions of the calibration points define your coordinate system.



Open the zactrack App and go to **Points**



Tap on the **System Calibration** button



You can choose between **Reinitialize System (Auto)** or **Reinitialize System (Measure)** or **Reposition Anchors (Auto)**

- Reinitialize System (Auto) will do a complete new Setup with a new coordinate System using Mesh ranging technology.
- Reinitialize System (Measure) will do a complete new Setup with a new coordinate System using Manual Measuring tool. Leica
- Reposition Anchors (Auto) will only reinitialize the position of a selected subset of anchors and does no changes in the coordinate system.



The system lists all discovered Anchors.

→ In case of an error message check: [Something went wrong?](#)



For the mesh ranging there have to be 4 points on the floor necessary. In default these four points are the predefined trackers blinking with the colors white, red, blue, and green.

→ In case of an error message check: [Something went wrong?](#)

The system guides you to position the four trackers.





The system is doing the Mesh ranging procedure.
→ In case of an error message check: [Something went wrong?](#)



After collecting the data the system is calculating the positions. The resolver tries to find the best solution. There can be more attempts and a lot of iterations



A green value means a good result.
→ If there is a yellow value or an error message check: [Something went wrong?](#)



The anchor status is now displayed as red. Upload Show 



Set up successful!

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Tracking Server

System settings about the tracking server can be accessed by

- tapping the 3 dots  in the top right corner to open the menu, and
- tapping **Tracking Server** in that menu.



The information at the top left shows - the IP address of your Master anchor, - the connection state, and - the system state.

With the buttons on the right you can access multiple sub-functions.
The list at the bottom displays the anchors and trackers discovered.

Tracking Config

You can add some configurations here for the tracking server. **Note: Only make changes here if you really know what you are doing!**

Anchor Link

The matrix displayed in the dialog popping up illustrates the UWB connection quality between the Master anchor and the other anchors.



Tracker Link

The matrix displayed in the dialog popping up illustrates the UWB connection quality between trackers and anchors.



Discover Devices

See [Discovery for Mini Systems](#) for details

Anchors & Trackers List

This list displays the anchors or trackers discovered.

By tapping on the tab *Trackers*, you can switch to the trackers list.
By tapping on the tab *Anchors*, you can switch to the anchors list.

In these lists you can see various information about the anchors trackers.
You can update the firmware of an anchor or tracker by selecting it and tapping on the button **Update Selected**.

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MOUNT

- Mount the 6 anchors around the stage.
- Active the Master Anchor and the other 5 Anchors with the button at the back. The color of LEDs represent different states:
 - **LED on anchor illuminates blue → anchor has power and is connected to tracking server.**
 - **LED on anchor red → anchor has power but no connection to tracking server.**
 - **LED on anchor green → anchor has power but no connection to the tracking server.**
- Connect the Master Anchor via a DMX cable with your effect devices.

Anchor Setup

All anchors should be mounted around stage on different heights. Here is an example of a simple anchor setup.



Note: Do not place an anchor directly next to a fixture



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Network

Network Port: zacNET

IP range	172.20.xx.xx
Subnet	255.255.0.0

Devices, such as laptops or a lighting console, can be connected to zactrack master anchor.

WiFi

- The zactrack master anchor hosts a wifi access point.
- The default wifi SSID starts with “zactrackMini” and contains a device dependent suffix.
- Your login sheet provides the default password.
- You can customized the following wifi settings:
 - your SSID,
 - your password,
 - the frequency, i.e., 2.4 GHz or 5 GHz,
 - the channel within the frequency chosen, and
 - if you want to hide your wifi/SSID.
- When you choose to hide your wifi access point, the SSID will not be shown when your device scans for available wifis.

Note: If you customize your wifi settings and do not remember them, you can lock yourself out. However, you can still access the zactrack master anchor via the network port. Nevertheless, we encourage you to change at least the password for security reasons.



XLR Port

Sends out DMX512 universe data to the effect devices attached.

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PREPARATIONS

This section tells you what you have to prepare to use zackrack.

BASIC PREPARATIONS

To operate a zackrack mini System, some basic preparations are necessary.

Connect the zackrack master anchor as seen in the lower picture (See also [Network](#)). Connect 5V USB-C Power supplies to the anchors and wait until they are fully charged (constant green light).

Put the trackers into the charging station and connect a 5V USB power supply. Wait until the trackers are fully charged (constant green light).

Hardware Setup Overview

Attention a zackrack mini System is limited at 5 anchors without the master anchor!



Set up the lighting console

It is possible to set up the lighting console and the zackrack CORE in 3 different setups depending on the conditions of the whole lighting network setup.

[Add](#) specific ZACFIXTURE channels on the lighting desk to control individual fixtures by zackrack.

[Add](#) specific ZACTAG channels on the lighting desk to control the settings of individual actors.

Grand MA 2

[DOWNLOAD](#) of prepared GRAND MA 2 / zackrack Fixture Types

Lighting console setup 1

The lighting desk sends e.g. Universe 1 over sACN or ArtNet → zackrack receives this Universe, manipulates the DMX channels according to the positions of the Actors and outputs the data on a new universe e.g. Universe 11 directly to the sACN / ArtNET DMX node.



Lighting console setup 2

The lighting desk sends e.g. Universe 1 over sACN or ArtNet → zackrack receives this Universe, manipulates the DMX channels according to the positions of the Actors and outputs the data on a new

universe e.g. Universe 11 back to the lighting desk.



Lighting console setup 3

The lighting desk sends e.g. Universe 1 Prio 100 over sACN → zacktrack receives this Universe, manipulates the DMX channels according to the positions of the Actors and outputs the data on the same universe e.g. Universe 1 Prio 101. The sACN / DMX node should always listen to the highest priority.

Note: zacktrack doesn't listen to its own universe output to prevent a sACN loop.



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Last update: **2022/11/07 15:54**



System Settings

Reach this dialog via the [menu](#).



CLIENT SETTING

App Orientation

Specifies the orientation of the Android client (default is portrait-mode).

Enable Analyzer View

If the option **Analyzer View** is enabled, an additional tab ANALYZER will be shown in the app's navigation bar.



This view contains additional, advanced information about several internal application and tracking processes.

Grid Points & Trusses

By activating this setting, you can access the [Grid Points](#) and [Trusses](#) pages in the show editor.

Allow Unassigned Tracker Selection

Background Image Selection

Provides the opportunity to upload an image that will be use as background image in the live view.

GENERAL SETTINGS

ArtNet Max Update Rate (Hz)

max. refresh rate of the ArtNet (if it is used) up to 90

sACN Max Update Rate (Hz)

max. refresh rate of sACN (if it is used) up to 90

PSN Data Update Rate (Hz)

actual refresh rate of PSN data (if it is used) up to 90

FILTER SETTINGS

Freeze Filter

The freeze filter enables a steady fixture beam even while small actor movements. The freeze Filter can be adjusted for each Actor on a control channel. 0% means no freeze (every little movement is recognized), 100% freezes the actual position. The fixture is still on the point and doesn't follow the Tag.



ACTOR SETTINGS

Height Offset DMX Mapping

It is possible to set a height offset on each tag via the console or in the [live view](#). If the tag is mounted as an example on the shoulders, but the middle of the light beam has to be on the chest you can do this with the height offset. With these values it is possible to arrange the DMX range to this height. DMX is an 8 bit value from 0-255, as an example 0 means -2000mm offset and 255 means 2000mm offset.

Freeze filter DMX Mapping

The freeze filter is used for removing small movements. The light stands still on the tracked person and small movements with the shoulders don't move the fixture. The strength of it can be arranged in the [live view](#) or on the [console](#). The meaning of the value is: 0 no freeze (each movement is transferred to the fixture) and 255 freeze position (the actor can move away and the fixture stays on the frozen point). The intensity of the freeze between 0 and 254 is set with these settings.

Smart Beam

The smart beam allows a constant beam size, if it is physically possible. If the correct values for the zoom, iris and focus area are in the [fixture type](#) the system automatically calculates the needed values for zoom iris and focus. The value of the DMX Mapping is for controlling the size of the beam via the console.

FIXTURE SETTINGS

XYZ Offset

This option determines whether or not the server listens to the fixture type XYZ offset channel sent from the console (see [zactrack Fixture Types](#)).

Crossfade

This option determines whether or not the server listens to the fixture type crossfade channel sent from the console (see [zactrack Fixture Types](#)).

P/T Edge Dim Black/White (% Range)

If a fixture reaches its physical PAN or TILT limits while tracking an actor, it might have to perform a flip to continue tracking. By default, the dimmer value will not change during this flip.

By adjusting the values **P/T Edge Dim Black/White (% Range)**, you can define fade out areas on the edge of available pan/tilt ranges. The dimmer value starts to fade out upon reaching the second value (white) and reaches total blackness (0) upon reaching the first value (black). In many cases, this leads to the flip being less visible due to it happening in total darkness.

Dimmer Smoothing

The value of the Dimmer Smoothing says how long it takes to dim up the light on the console value, if the tag activates in the system.

Auto 6M 50% Dimmer Mode

If this option is activated, the dimmer value from the console will merged directly like the other channels (see [for details](#)).

When this option is deactivated, the system calculates the final dimmer value as follows:

$$\text{final_value} = \text{dmx_min} + \text{auto_value} * \text{console_value} * (\text{dmx_max} - \text{dmx_min})$$

with `console_value` depending on the option **Auto 6M Use Full Console Range**.

Auto 6M Use Full Console Range

There are two different ways of how the multipliers are calculated, depending on whether or not the advanced property in the [System Settings](#) is enabled or not.

Option 1: Property "Auto 6M Use Full Channel Range" is enabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_full_range_min** and **dmx_full_range_max** be the theoretical dmx value limits, **regardless of the limits set in the fixture's fixture type**. Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_full_range_min) /  
(dmx_full_range_max - dmx_full_range_min))  
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range **defined in its fixture type** (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **127** (50 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **255** (100 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).

Option 2: Property "Auto 6M Use Full Channel Range" is disabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_min** and **dmx_max** be the dmx limits **as specified in the fixture's fixture type**. Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_min) / (dmx_max - dmx_min))  
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range **defined in its fixture type** (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of limited dmx range) from the lighting console leads to the final DIMMER value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **65** (50 % of limited dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **131** (100 % of limited dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).

- ...sending an IRIS value of **255** (195 % of limited dmx range) from the lighting console leads to the final IRIS value being **almost four times as big** as **auto_value** (due to the multiplier being **3.9**).

Dimmer Fadeout On Actor Timeout

If an actor is completely lose in the system, the fixture dims down in the time of the fade duration. If a stable signal is coming back, after the recovery delay time the light fades up to the console value.

P/T Alignment Transition

When this setting is enabled, you can define the number of degrees the fixture should move pre second (default: 60 degrees/second). This setting can help to avoid "swinging" of the truss if the fixture moves to fast.



CALIBRATION SETTINGS

The system calibration uses 4 trackers as calibration points to measure and calculate the coordinate system. For proper calculations, the system needs to know which tracker occupies the role of the origin, x-axis, etc. Here you can specify that mapping.

Note: This must be a 1:1 mapping → one tracker can only act as one calibration point, and vice versa!

SUB TOPICS

- [Advanced Settings](#)

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<https://manual.zactrack.com/> - **zactrack**

Permanent link:
https://manual.zactrack.com/doku.php?id=manual:mini_system_settings

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Tips and Tricks to guarantee best tracking results

TRACKER Placement

70% of the human body is made up of water. UWB radio waves can be blocked by body parts completely. Placing the zactrack TRACKER between two hands will render it invisible to the ANCHOR antennas.

Optimal TRACKER Placement

Good radio tracking results rely on the optimal placement of zactrack Trackers on the performer. The best placement for redundancy and secure tracking is by using two TRACKERS per actor. 

TRACKERS should be placed on a high position on the body to have direct radio 'visibility' to as many ANCHORS as possible. The TRACKER must reach at least 4 ANCHORS to get a valid 3D position.

TRACKERS can be hidden under the cloth of the costume. 

Using only one TRACKER is not optimal.

Try to position it as high up as possible, best on top of the head. (under a hat or in the hair dress).

Bad TRACKER Placement

As mentioned, radio waves do not travel through water. The human body can shield the TRACKER from its contact with the ANCHORS. 

Placing the TRACKER in the front of the body (like dangling on a lanyard) will block half the space.

Placing the TRACKER on a belt on the hip or in the back pocket will again shield you from half the space.



ANCHOR Placement

In a standard setup zactrack MINI uses **6 ANCHORS** (including the MASTER anchor) to define the tracking space.

A simple design would distribute the ANCHORS equally spaced (but not too regularly) around the playing area.



For good position measurement, mount the Anchors at alternating heights.



Avoiding Reflection Signals

Radio waves can be reflected by metal surfaces. Especially in confined spaces with lots of metal structures the radio signal can bounce back from surfaces and deliver false tracking positions.

Always mount Anchors min 0.5m / 2 ft away from metal structures, fixtures or speakers.



Signal Crosstalk

zactrack MINI UWB tracking works at radio channel 5 at frequency 6,5 GHz with a 500 MHz bandwidth. Make sure no other system is using the same frequency as it will cause problems in tracking quality up to total signal crosstalk and total signal loss.

UWB applications are operating within a free bandwidth with strict power regulations. Neighboring applications in the same channel have to maintain the power level low enough (0.1% of a cell phone) to avoid the disturbance of others. Overpowered systems, which influence other applications or flood the whole frequency band are not allowed to operate following FCC guidelines.

We strongly advise a consequent frequency management onsite before running the show to avoid overlapping radio frequencies and possible conflict of different technologies!

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https://manual.zactrack.com/doku.php?id=manual:mini_tips_tricks

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Universes

zactrack is able to send and receive the following network DMX protocols:

- **ArtNet**
- **sACN**

Note: A zactrack mini system can send out one universe via physical XLR (which is marked with ).

Additional universes can be sent via Ethernet (sACN, ArtNet).



Add universes

- Tap on Universes in the Show Editor
- Tap  to add a new universe
- Type in a unique name of the universe and tap on Create
- Choose Input or Output universe
- Choose ArtNet or sACN and type in the appropriate universe
 - **ArtNet**
 - Broadcast: 2.255.255.255
 - Unicast: Type in the IP address of the appropriate network listener (Ethernet/DMX Node)

Note: Universe starts at 0.0
 - **sACN**
 - Multicast
 - Unicast: Type in the IP address of the appropriate network listener (Ethernet/DMX Node)
- Toggle In Merge and choose the appropriate IN Universe if you also have additional fixtures patched in the universe which you don't use for following.
→ **All channels coming from this IN Universe will be rerouted to this created OUT universe**
- Tap Ok
- Tap  and tap upload to server
Note: Upload to server will affect the current show
-  shows successful upload



Universe traffic monitoring

- Tap on Universes in the Show Editor
- Tap on  on the right side of the specific universe you want to monitor
Note: You can monitor both IN and OUTPUT universes



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MOUNT

1. Mount the anchors around the stage according to your [3D](#) or [2D](#) needs
2. Connect the zactrack CORE (ETHERNET PORT1) to the zacNET network switch
3. Connect the anchors with a CAT6 cable to a PoE switch within the zacNET

Note:

LED on anchor illuminates blue → anchor has power and is connected to tracking server

LED on anchor blinks green → anchor has power but no connection to tracking server

Max. length of CAT6 with PoE is 100m. It is possible to extend the range with fiber optic cables

4. Connect the zactrack CORE (ETHERNET PORT2) to the lighting network switch

3D Anchor Setup

All anchors should be mounted around stage on different heights. To get accurate Z-axis positions it is necessary to mount the anchors on multiple Z-levels. Below you will find 2 examples for a 3D anchor setup.

For a 3D position the system picks at least 4 anchors.

Note: Don't forget to set the tracking type to 3D in the [System Settings](#).



A zactrack 3D anchor setup could look like this



2D Anchor Setup

All anchors should be mounted around stage. For 2D anchor setup it is NOT necessary to mount the anchors on multiple Z-levels. Below you will find 2 examples for a 2D anchor setup.

For a 2D position the system picks at least 3 anchors.

Note: Don't forget to set the tracking type to 2D in the [System Settings](#).



A zacktrack 2D anchor setup could look like this



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<https://manual.zacktrack.com/> - **zacktrack**

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<https://manual.zacktrack.com/doku.php?id=manual:mount>

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MOUNT

- Mount the 8 anchors around the stage. The positions of the anchors should be as asymmetrical as possible, for good resolution in 3D 4 anchors should be up and 4 down.
- Connect the zactrack CORE (Server ETHERNET PORT1) to a network switch
- Connect the anchors with a CAT6 cable to a PoE switch within the zacNET

Note:

LED on anchor illuminates blue → anchor has power and is connected to tracking server

LED on anchor red → anchor has power but no connection to tracking server

Max. length of CAT6 with PoE is 100m. It is possible to extend the range with fiber optic cables

- Connect the zactrack CORE (Server ETHERNET PORT2) to the lighting network switch

3D Anchor Setup

All anchors should be mounted around stage on different heights. To get accurate Z-axis positions it is necessary to mount the anchors on multiple Z-levels. Below you will find 2 examples for a 3D anchor setup.

For a 3D position the system picks at least 4 anchors.

Note: You can change the tracking type from 2D to 3D direct on each tracker on the lightconsole



Note: Do not place an anchor directly next to a fixture



2D Anchor Setup

All anchors should be mounted around stage. For 2D anchor setup it is NOT necessary to mount the anchors on multiple Z-levels. Below you will find 2 examples for a 2D anchor setup.

For a 2D position the system picks at least 3 anchors.



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Network



Network Port 1: zacNET

IP range	172.20.xx.xx
Subnet	255.255.0.0

- All anchors are connected to zacNET
- WIFI Access Point is connected to zacNET

Note: To set up the WIFI access point please go to [Set up the WIFI network](#)



Network Port 2: sACN, ArtNet, PSN, OSC

Standard IP	192.168.0.200
Subnet	255.0.0.0

Note: Change the ip address of Port 2 in [Advanced Settings / System Config](#)

- **sACN (streaming ACN)**
*ACN (and streaming ACN) is an ANSI/ESTA international standard.
For additional information about this protocol please read:
http://en.wikipedia.org/wiki/Architecture_for_control_networks*
- **Art-Net** support of Art-Net 1, 2
*Art-Net is a royalty free protocol developed by Artistic Licence
For additional information about this protocol please read:
<http://www.artisticlicence.com>*
- **PSN**
*PosiStageNet or PSN is a open protocol developed by MA Lighting and VYV Corporation
For additional information about this protocol please read:
<http://www.posistage.net>*
- **OSC**
*Open Sound Control (OSC) is a protocol for communication among computers, sound synthesizers, and other multimedia devices
For additional information about this protocol please read:
<http://opensoundcontrol.org>*

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<https://manual.zactrack.com/> - **zactrack**

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<https://manual.zactrack.com/doku.php?id=manual:network>

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New Show

You can create a new show by tapping on the **New Show** option in the [menu](#). 

1. Select if you want to create an empty show, or if you would like to start with your default show.
2. Tap Create to create a new local show.

Note: This will only overwrite your LOCAL show. The active show on the server will be unchanged until you decide to upload your local one.

When you decided to create an empty show, your local show file will be completely empty except for a single, mandatory **out** universe as well as a *default* scene, fixture group, and actor group.

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OSC

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<https://manual.zacktrack.com/doku.php?id=manual:osc>

Last update: **2018/07/26 16:38**



Points

This section describes how to measure specific points. Add and measure all anchors and calibration points.



SUB TOPICS

- [Define origin on stage](#)
- [Relocate measuring tool](#)
- [Validate Points](#)
- [Measure Points](#)

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Last update: **2020/04/15 09:54**



PosiStageNet (PSN)

PosiStageNet or PSN is a open protocol developed by MA Lighting and VYV Corporation

For additional information about this protocol please read:

<http://www.posistage.net/>

From:

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Permanent link:

<https://manual.zactrack.com/doku.php?id=manual:psn>

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PUCK



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https://manual.zactrack.com/doku.php?id=manual:puck_pro

Last update: **2022/11/09 13:39**



PUCK

Each Zactrack Smart System has 4 different colored pucks. These pucks perform two different tasks.

1. They define the coordinate system and calibrate the system.
2. The inbuilt lighting sensor performs the alignment process. [Align](#)



The basic function of the Puck is to define the coordinate system. Each color has a different meaning. The system needs a coordinate system to connect the virtual 3D world with the real world. This is necessary, because if you stay in front of your stage and you want to move your light right, it should go right and not up. So we normally use the X axis from left to right and the Z axis from bottom to top.

Color description

1. **Black:** origin cordinate 0/0/0
2. **Red:** positive X Axis
3. **Green:** positive Y Axis
4. **Blue:** Additional Point for Calibration

To perform the [MEASURE](#) process, the four pucks should be positioned as roughly as a square at the main tracking area. With the desired coordinate system.



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ZACTRACK SETUP

Please follow this process to setup the zactrack system

- [MOUNT](#)
- [MEASURE](#)
- [ALIGN](#)
- [FOLLOW](#)

Hardware Setup Overview



A zactrack Setup could look like this



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UWB Radiotracking

zactrack uses DecaWave's unrivalled precise indoor and outdoor real time location system.

- **Precise location system <10cm**
- **Easy and quick setup**
- **Very small transmitter**
- **Permissive, passes through materials**
- **Works in all weather conditions**

- For more information please go to <https://www.decawave.com>
- Worldwide Telecommunications Regulations governing the use of Ultra-Wideband radio
https://www.decawave.com/sites/default/files/apr001_uwb_worldwide_regulations_summaryrev1.2.pdf

RTLS Real Time Location System



A simplified model

The tracking server calculates all individual distances from zaCtag to each anchor and triangulates the real time position ... The simplified spring model describes this method.



Tracking Accuracy

The technical accuracy of the system is +/- 5cm. But the actual "Accuracy" of the whole tracking system in general is influenced by the combination of three factors:

- **Update rate**

 The rate of positional measurements per second defines the amount of data for the prediction math. The higher the update rate, the smoother my movements.
(typical for UWB radio tracking: 15Hz to 35 Hz)

- **Error distribution**

The maximum radius and the shape of the error distribution defines the amount of filtering to achieve a stable position measurement.

- **Latency**

The latency is the delay between the actual movement in the real world and the output of the calculated position over the network including the actual movement behavior of the effect device (fixture, camera,...) . Bad update rate und error distribution will increase the overall latency.

Radio Interference



Reflection

- Metallic surfaces
- Wire meshes
- Water surfaces



Distortion

- Magnetic fields
- LED walls
- Speakers



Shielding

- 5cm water – 100%
- Body parts
- Metal in costumes

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<https://manual.zactrack.com/doku.php?id=manual:radio>

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Relocate measuring tool

If you relocate the disto to a new position it is essential to align it with the defined origin. If you haven't defined an origin yet please go to [Define origin on stage](#).

By measuring three already measured points (calibration points or anchors) zactrack automatically calculates the new position of the measuring tool. For best accuracy choose points which are well spaced and from three different sides.

NOTE: Only after the relocation procedure you can continue with measurements. Without relocation all new measurements would be WRONG.

1. [Set up the LEICA Disto S910](#)
2. Go to Show Editor and tap ReLocate in the Points Section
3. Tap Disto and aim the laser on the first target point
Note: You can only relocate the measuring tool with points you have already measured and saved in the Show. You can use anchors and calibration points.
4. Tap Measure
Note: Tablet will BEEP after successful measurement and jump to the next line automatically
5. Tap Disto and aim the laser on the second target point
6. Tap Measure
Note: Tablet will BEEP after successful measurement and jump to the next line automatically
7. Tap Disto and aim the laser on the third target point
8. Tap Measure
Note: Tablet will BEEP after successful measurement and calculate the current position of the measuring tool automatically
9. Please check the plausibility of the calculated position of the measuring tool

 **Example:**
Measuring tool at (-592,-2307,1154)
X: -592 mm
Y: -2307 mm
Z: 1154 mm
10. Tap Ok
11. Now you are ready to [Measure Points](#) again

RELATED TOPICS

- [Define origin on stage](#)
- [Validate Points](#)
- [Measure Points](#)

From:

<https://manual.zactrack.com/> - **zactrack**

Permanent link:

<https://manual.zactrack.com/doku.php?id=manual:relocate>

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Safety Standards

The zactrack CORE is conform to the following harmonized standards:

Electromagnetic Compatibility

- EN55022: 2010
- EN55024: 2010
- EN61000-3-2: 2006 +A1: 2009+ A2: 2009
- EN61000-3-3: 2008

Electrical equipment designed for use within certain voltage limits

- EN 60950-1 / A1: 2010
- EN 60950-1 / A11: 2009
- EN 60950-1 / A12: 2011
- EN 60950-1: 2006
- EN62479: 2010

Establishing a framework for the setting of ecodesign requirements for energy-related products

- EC NO 1275 / 2008
- 617/2013
- EN62301: 200
- EN 62623:2013
- EN ISO 9296
- EN ISO 7779

Restriction of the use of certain hazardous substances in electrical and electronic equipment

- EN 50581: 2012

Statement of conformity

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Permanent link:
https://manual.zactrack.com/doku.php?id=manual:safety_information

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Safety Standards

The zactrack mini KIT is conform to the following harmonized standards:

DIRECTIVE 2001/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3rd December 2001

on the approximation of the laws of the Member States relating on general product safety.

DIRECTIVE 2014/53/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16th April 2014

on the harmonisation of the laws of Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC Text with EEA relevance.

DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21st October 2009

establishing a framework for the setting of ecodesign requirements for energy-related products.

Conformity is proven by compliance with the following standards:

- EC NO 1275 / 2008
- 617/2013
- EN62301: 200
- EN 62623:2013
- EN ISO 9296
- EN ISO 7779

DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8th June 2011

on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Conformity is proven by compliance with the following standards:

- EN 50581: 2012

Statement of conformity

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Scenes

zactrack enables multiple scenes of different autofunctions parameters.

These scenes can be changed manually or from the console. (See [Change Active Scene](#))



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SERVER

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SERVER



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https://manual.zactrack.com/doku.php?id=manual:server_smart

Last update: **2022/11/09 13:21**



Set up the LEICA Disto S910

- Mount the Leica Disto S910 on the tripod mount and the tripod
- Place the tripod on a position on stage where you are able to reach the origin, the X+ axis mark and as many anchors and cp calibration points as possible with the laser.
- Level the tripod
- Turn ON the Leica Disto S910 and open up a WIFI Hotspot on the Leica Disto S910
- Press FUNC on the Leica Disto S910
- Tap  in the right bottom corner and press = on the keyboard
Note: If the Leica Disto S910 is connected correctly, the Leica calibration will start automatically now.
- Level the Leica Disto S910

- Connect the tablet to the Leica WIFI Hotspot
- Open the zactrack APP on the zactrack tablet
- Go to *Show Editor* and tap Points on the bottom
- Tap Disto Status
- Tap Discover to get the current ip address of the Leica S910 Disto and tap Ok
- The Leica Disto S910 is now ready for measuring

RELATED TOPICS

- [Define origin on stage](#)
- [Relocate measuring tool](#)
- [Validate Points](#)
- [Measure Points](#)

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<https://manual.zactrack.com/> - **zactrack**

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Settings

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<https://manual.zacktrack.com/doku.php?id=manual:settings>

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SHOW EDITOR

- [Points](#)
- [Universes](#)
- [Fixture Types](#)
- [Fixtures](#)
- [Fixture Groups](#)
- [Actors](#)
- [Grid](#)

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Permanent link:

https://manual.zacktrack.com/doku.php?id=manual:show_editor

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Show Settings

Reach this dialog via the [menu](#).



- Enter the desired **name of your show** into the first text field.
Note: This name can be used to identify shows of a specific venue, scenario or similar.
- Enter the name of the **show author** into the second text field.
- Choose the **scene universe** and **scene channel** (only visible after selecting a universe) used for your show. This can be used to change the currently active scene (see [Scenes](#)).
- If you have defined a distortion grid for your show, you can enable it by checking **Use Distortion Grid**.
- Press Save to save the new show settings.

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Permanent link:

https://manual.zacktrack.com/doku.php?id=manual:show_settings

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Show Settings

You can change the current show's settings by tapping on the **Show Settings** option in the [menu](#).



- Enter the desired **name of your show** into the first text field.
Note: This name can be used to identify shows of a specific venue, scenario or similar.
- Enter the name of the **show author** into the second text field.
- Choose the **DMX OUT universe** of your show.
- Choose the **scene universe** and **scene channel** (only visible after selecting a universe) used for your show. This can be used to change the currently active scene (see [Scenes](#)).
- If you have defined a distortion grid for your show, you can enable it by checking **Use Distortion Grid**.
- Press Save to save the new show settings.

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zactrack manual

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[[smart:start]] \\

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 - [Set up the zactrack Puck](#)
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-

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```
* [[manual:Points]]
* [[manual:Define Origin]]
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```

* [LIVE](#)

- [Actor Live View](#)
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Autofunctions APP

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[[manual:Tracking Server]]\

zactrack site notice:  **zactrack**[®]

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Last update: **2020/05/05 08:43**





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System Overview



zactrack® is an automated Follow-System.

People and objects in motion are tracked with high accuracy and represented in a 3D computer model. Based on these inputs, various effect devices are controlled to point, follow, and focus automatically.

zactrack uses ultra wide band radio tracking to measure all positions in real-time. People and objects are equipped with a so called zacTag. Multiple anchors around the stage collect the radio signals and send it to the zactrack CORE for 3D calculation.

Control sequences like DMX commands are produced and sent to the different effect-devices like moving lights (via sACN, ArtNet), Soundengines (via OSC), media servers (via PSN, sACN, ArtNet, OSC,...) or cameras.



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Software Overview

zacktrack uses 4 different software applications on 2 devices.

zacktrack SERVER

- zacktrack CORE
- [Tracking Server](#)



zacktrack TABLET

- [zacktrack 3 APP](#)
- [Autofunctions APP](#)



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Last update: **2022/11/11 10:33**



Software Overview

zactrack uses 4 different software applications on 2 devices.

zactrack SERVER

- zactrack CORE



zactrack TABLET

- [zactrack 3 APP](#)
- [Autofunctions APP](#)



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Last update: **2022/11/04 13:57**



Speed Presets

In zactrack it is possible to store 3 different speed presets for each fixture type which can be changed in real time from the lighting console or manually on the tablet.



- **Precalc [ms]**

- XYZ positions in the past are used to predict the future position
- Precalc time pushes the position further into the future
- Higher precalc makes the curve “jumpy”
- 0-1000ms common precalc range

- **Smoothing**

- Length of history defines the smoothness of the curve
- Short history makes the curve less smooth
- Long history adds up more latency
- 0% → no smoothing → almost raw signal
- 10% - 100% common smoothing range



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Start Alignment

zacktrack calculates the exact positions and rotations of all fixtures by pointing the center of the lighting beam at the calibration points. The zacktrack client enables complete control of the fixture base channels Pan, Tilt, Dimmer, Iris, Focus and Zoom.

- Go to section “fixtures”
- Tab “Alignment” in the Fixtures Section
- Tab on “Edit” to align the fixture you want to
 1. Adjust the basic fixture channels (Dimmer, Iris, Focus, Zoom) until you have the smallest possible light beam of the fixture. Use the channel sliders
 2. Save these adjustments by tapping and holding on the preset buttons until a beep sound will be generated
 3. Pick a calibration point
 4. Point the light beam of the fixture roughly on the selected calibration point by using the PAN/TILT touchpad
 5. Place the zacktrack Sensor Puck on the calibration point
 6. Tap “auto” -> The zacktrack Core automatically aligns the center of the beam on the calibration point
 7. Tap “save”
 8. Redo (6) and (7) until fixture pointed at all calibration points
 9. Tap “Close”
- 10. Select the fixtures you want to align at the same time NOTE: The more fixtures you want to align at the same time the longer zacktrack will calculate for the positions and rotations of the fixtures
- 11. Tap “Start” NOTE: zacktrack CORE won’t affect the current show until you upload the local version to the server
- 12. When zacktrack CORE has finished the alignment a beep sound will be generated
 - Tap “Download”
- 13. Recheck the aligned position of the fixture in the section “Fixtures”
- 14. When the aligned position is a plausible solution, tap  and “upload to server” NOTE: “Upload to server” will affect the current show
- 15.  shows successful upload



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<https://manual.zacktrack.com/> - **zacktrack**

Permanent link:

https://manual.zacktrack.com/doku.php?id=manual:start_alignment

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System Overview



zactrack® is an automated Follow-System.

People and objects in motion are tracked with high accuracy and represented in a 3D computer model. Based on these inputs, various effect devices are controlled to point, follow, and focus automatically.

zactrack uses ultra wide band radio tracking to measure all positions in real-time. People and objects are equipped with a so called zacTag. Multiple anchors around the stage collect the radio signals and send it to the zactrack CORE for 3D calculation.

Control sequences like DMX commands are produced and sent to the different effect-devices like moving lights (via sACN, ArtNet), Soundengines (via OSC), media servers (via PSN, sACN, ArtNet, OSC,...) or cameras.



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System Settings

Reach this dialog via the [menu](#).



GENERAL SETTING

Tracking Type

Change between **2D** and **3D** tracking modes. Changing this option requires a restart of the tracking server and will lead to a short downtime (usually not longer than a few seconds).

Setting the tracking mode to 2D means that the z-position (height) of all actors no longer changes with the actual height of the tag, but are instead determined by the actor's height setting (see [Actors view](#)) and possible XYZ console offsets.

Note: Make sure that your setup is suited for the selected tracking mode (see [MOUNT](#)).

Enable Analyzer View

If the option **Analyzer View** is enabled, an additional tab ANALYZER will be shown in the app's navigation bar.



This view contains additional, advanced information about several internal application and tracking processes.

Zactrack Puck IP

If this option is enabled, the application uses the [zactrack Puck](#) for fixture auto alignments. Otherwise, the device's own light sensor will be used.

If a zactrack Puck is used that does not have the default IP of **10.10.1.211**, please enter the correct puck IP in the adjacent text field.

ArtNet Update Rate (Hz)

actual refresh rate of the ArtNet (if it is used) up to 90

sACN Update Rate (Hz)

actual refresh rate of the ArtNet (if it is used) up to 90

FILTER SETTINGS

Freeze Filter

The freeze filter enables a steady fixture beam even while small actor movements. The freeze Filter can be adjusted for each Actor on a control channel. 0% means no freeze (every little movement is recognized), 100% freezes the actual position. The fixture is still on the point and doesn't follow the Tag.

The Z-Multiplier in percent says how much freeze is used from the actor channel in z-direction. Normally there is a very small amount of movement in z-direction, so a smaller freeze is possible.

2-Merge Distance Filter

It is possible to merge two or more tags in [Actor](#) settings. Merging is used for redundancy and a stable position. If there are two tags used, you are able to do some settings. If there are more than 2 Tags used in a merge, these settings are not necessary, because the system takes a selection of the two best tags.

If one of the merged tags (2 are merged) moves away from a stable point, the system keeps the stable actor. The recovery Time says how long the disappeared actor had to be back in the merge distance to the other tag to use this position for a merge. The smoothing Duration is the time needed to move to the new position, if there is a mismatch with the actual position (only if the system has lost a tag).

2-Merge Z-Distance Filter

The Z-Distance Filter basically functions like the normal 2 merge Distance Filter, but only for the Z axis. The error threshold value indicates the maximum z difference between two tags. If it exceeds, the system always uses the lower position. If a tag exceeds this value, its information is rejected. The Recovery Threshold is the value shown when the rejected tag is used again.



ACTOR SETTINGS

Height Offset DMX Mapping

It is possible to set a height offset on each tag via the console or in the [live view](#). If the tag is mounted as an example on the shoulders, but the middle of the light beam has to be on the chest you can do

this with the height offset. With these values it is possible to arrange the DMX range to this height. DMX is an 8 bit value from 0-255, as an example 0 means -2000mm offset and 255 means 2000m offset.

Freeze filter DMX Mapping

The freeze filter is used for removing small movements. The light stands still on the tracked person and small movements with the shoulders don't move the fixture. The strength of it can be arranged in the [live view](#) or on the [console](#). The meaning of the value is: 0 no freeze (each movement is transferred to the fixture) and 255 freeze position (the actor can move away and the fixture stays on the frozen point). The intensity of the freeze between 0 and 254 is set with these settings.

Smart Beam

The smart beam allows a constant beam size, if it is physically possible. If the correct values for the zoom, iris and focus area are in the [fixture type](#) the system automatically calculates the needed values for zoom iris and focus. The value of the DMX Mapping is for controlling the size of the beam via the console.

FIXTURE SETTINGS

XYZ Offset

This option determines whether or not the server listens to the fixture type XYZ offset channel sent from the console (see [zactrack Fixture Types](#)).

Crossfade

This option determines whether or not the server listens to the fixture type crossfade channel sent from the console (see [zactrack Fixture Types](#)).

P/T Edge Dim Black/White (% Range)

If a fixture reaches its physical PAN or TILT limits while tracking an actor, it might have to perform a flip to continue tracking. By default, the dimmer value will not change during this flip.

By adjusting the values **P/T Edge Dim Black/White (% Range)**, you can define fade out areas on the edge of available pan/tilt ranges. The dimmer value starts to fade out upon reaching the second value (white) and reaches total blackness (0) upon reaching the first value (black). In many cases, this leads to the flip being less visible due to it happening in total darkness.

Dimmer Smoothing

The value of the Dimmer Smoothing says how long it takes to dim up the light on the console value, if the tag activates in the system.

If this option is activated, the dimmer value from the console will merged directly like the other channels ([see for details](#)).

When this option is deactivated, the system calculates the final dimmer value as follows:

```
final_value = dmx_min + auto_value * console_value * (dmx_max - dmx_min)
```

with `console_value` depending on the option **Auto 6M Use Full Console Range**.

Auto 6M Use Full Console Range

There are two different ways of how the multipliers are calculated, depending on whether or not the advanced property in the [System Settings](#) is enabled or not.

Option 1: Property "Auto 6M Use Full Channel Range" is enabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_full_range_min** and **dmx_full_range_max** be the theoretical dmx value limits, **regardless of the limits set in the fixture's fixture type**. Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_full_range_min) /  
(dmx_full_range_max - dmx_full_range_min))  
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range [defined in its fixture type](#) (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **127** (50 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **255** (100 % of theoretical dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).

Option 2: Property "Auto 6M Use Full Channel Range" is disabled:

Let **auto_value** be the value calculated based on autofunctions/smart zoom and **console_value** the one received from the console on the fixture's input universe. Furthermore, let **dmx_min** and **dmx_max** be the dmx limits [as specified in the fixture's fixture type](#). Then the final channel value **final_value** is calculated by using the following formula:

```
multiplier = 2 * ((console_value - dmx_min) / (dmx_max - dmx_min))
final_value = auto_value * multiplier
```

For example, consider a fixture with an **8-bit** IRIS channel (theoretical DMX values of **0-255**), but a limited dmx range [defined in its fixture type](#) (e.g. DMX values of **0-131**). With Auto 6M mode active...

- ...sending an IRIS value of **0** (0 % of limited dmx range) from the lighting console leads to the final DIMMER value being **0**, regardless of autofunctions or other factors (due to the multiplier being **0** as well).
- ...sending an IRIS value of **65** (50 % of limited dmx range) from the lighting console leads to the final IRIS value being **exactly the same** as **auto_value** (due to the multiplier being **1**).
- ...sending an IRIS value of **131** (100 % of limited dmx range) from the lighting console leads to the final IRIS value being **twice as big** as **auto_value** (due to the multiplier being **2**).
- ...sending an IRIS value of **255** (195 % of limited dmx range) from the lighting console leads to the final IRIS value being **almost four times as big** as **auto_value** (due to the multiplier being **3.9**).

Dimmer Fadeout On Actor Timeout

If an actor is completely lose in the system, the fixture dims down in the time of the fade duration. If a stable signal is coming back, after the recovery delay time the light fades up to the console value.

SUB TOPICS

- [Advanced Settings](#)

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<https://manual.zackrack.com/> - **zackrack**

Permanent link:
https://manual.zackrack.com/doku.php?id=manual:system_settings

Last update: **2022/11/11 10:28**



Tag-positions

The recommended tag-positions are between the shoulders (see below). The tag has to be mounted in vertical direction.

NOTE: Body parts can obstruct the radio signal!



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<https://manual.zactrack.com/> - **zactrack**

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<https://manual.zactrack.com/doku.php?id=manual:tag-position>

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TRACKER



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TRACKER

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https://manual.zactrack.com/doku.php?id=manual:tag_smart

Last update: **2020/04/22 14:56**



Tips and Tricks to guarantee best tracking results

TRACKER Placement

70% of the human body is made up of water. UWB radio waves can be blocked by body parts completely. Placing the zactrack TRACKER between two hands will render it invisible to the ANCHOR antennas.

Optimal TRACKER Placement

Good radio tracking results rely on the optimal placement of zactrack Trackers on the performer. The best placement for redundancy and secure tracking is by using two TRACKERS per actor. 

TRACKERS should be placed on a high position on the body to have direct radio 'visibility' to as many ANCHORS as possible. The TRACKER must reach at least 4 ANCHORS to get a valid 3D position.

TRACKERS can be hidden under the cloth of the costume. 

Using only one TRACKER is not optimal.

Try to position it as high up as possible, best on top of the head. (under a hat or in the hair dress).

Bad TRACKER Placement

As mentioned, radio waves do not travel through water. The human body can shield the TRACKER from its contact with the ANCHORS. 

Placing the TRACKER in the front of the body (like dangling on a lanyard) will block half the space.

Placing the TRACKER on a belt on the hip or in the back pocket will again shield you from half the space.



ANCHOR Placement

In a standard setup zactrack SMART uses **8 ANCHORS** to define the tracking space. A simple design would distribute the ANCHORS equally spaced (but not too regularly) around the playing area.



For good 3D position measurement, mount the Anchors at alternating heights.



You can use up to **11 ANCHORS** for enhancing the tracking stability. More Anchors will produce redundancy in measurements and will make the calculated position more stable.



Alternatively, you can use up to **11 ANCHORS** to cover a larger tracking area or a different shape of the stage.

FOH Stage



Catwalk



Avoiding Reflection Signals

Radio waves can be reflected by metal surfaces. Especially in confined spaces with lots of metal structures the radio signal can bounce back from surfaces and deliver false tracking positions.

Always mount Anchors min 0.5m / 2 ft away from metal structures, fixtures or speakers.



Signal Crosstalk

zactrack SMART UWB tracking works at radio channel 5 at frequency 6,5 GHz with a 500 MHz bandwidth. Make sure no other system is using the same frequency as it will cause problems in tracking quality up to total signal crosstalk and total signal loss.

UWB applications are operating within a free bandwidth with strict power regulations. Neighboring applications in the same channel have to maintain the power level low enough (0.1% of a cell phone) to avoid the disturbance of others. Overpowered systems, which influence other applications or flood the whole frequency band are not allowed to operate following FCC guidelines.

We strongly advise a consequent frequency management onsite before running the show to avoid overlapping radio frequencies and possible conflict of different technologies!

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Tracking Server

The tracking server is connected to all anchors and its main process is to calculate the real time positions of all active zacTags. These positions will be sent to zackrack CORE which runs simultaneously on the same zackrack SERVER.

Go to Tracking Server

- Go to Show Editor in the zackrack 3 APP
- Tap on  in the top right corner to open the menu
- Tap on Tracking Server → You will be forwarded to the WebInterface of the Tracking Server

Login

- Tap on your username and enter your password → *password is listed on provided login sheet*



System Status

- Tap on  in the top right corner to open the menu
- Tap on System Status to open the tracking server overview

Overview



The overview shows the following real time information:

- Primary channel
- RTLS mode
- Update Rate [Hz]
- Active Anchors
- Active zacTags

Anchor Link

The anchor link shows you the radio signal link of each anchor to each other.



Sensor Link



Logging



Overrides



```
### TRACKING SERVER CONFIG LINES

# --> means Comment and is not part of the config line

### INCLUDE ANCHORS
anchor_hubs.eui=XXXXX
network.anchor_ip_eth=10.10.XX.XX

### INCLUDE TRACKERS
sensors.eui=XXXXX

### EXCLUDE ANCHORS
anchor_hubs.eui=!XXXXX

### EXCLUDE TRACKERS
sensors.eui=!XXXXX
```

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TRACKING SERVER

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Last update: **2020/05/05 08:46**



Universes

zactrack is able to send and receive the following network DMX protocols:

- **ArtNet**
- **sACN**



Add universes

- Tap on Universes in the Show Editor
- Tap  to add a new universe
- Type in a unique name of the universe and tap on Create
- Choose Input or Output universe
- Choose ArtNet or sACN and type in the appropriate universe
 - **ArtNet**
 - Broadcast: 2.255.255.255
 - Unicast: Type in the ip address of the appropriate network listener (Ethernet/DMX Node)
Note: Universe starts at 0.0
 - **sACN**
 - Multicast
 - Unicast: Type in the ip address of the appropriate network listener (Ethernet/DMX Node)
- Toggle In Merge and choose the appropriate IN Universe if you also have additional fixtures patched in the universe which you don't use for following.
→ **All channels coming from this IN Universe will be rerouted to this created OUT universe**
- Tap Ok
- Tap  and tap upload to server
Note: Upload to server will affect the current show
-  shows successful upload



Universe traffic monitoring

- Tap on Universes in the Show Editor

- Tap on  on the right side of the specific universe you want to monitor

Note: You can monitor both IN and OUTPUT universes



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<https://manual.zacktrack.com/doku.php?id=manual:universes>

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Upload / Download Show

zactrack uses a server / client architecture. The actual *show file* runs on the zactrack SERVER, but the zactrack APP on the tablet creates and manipulates the *show file*. Due to this, every change of the *show file* needs to be pushed/uploaded to the zactrack SERVER.

!! NOTE: For safety reasons all changes are stored locally on the zactrack APP (TABLET). You have to trigger a download or an upload of the *show file* manually. The running show won't be affected until the local *show file* will be manually uploaded to the zactrack SERVER!

Every uploaded *show file* will be saved locally on the zactrack SERVER. You have access to all *show files* of the past.

The following icons located in the top right corner inside the zactrack APP indicate the different synchronization states of the SERVER and APP *show files*.

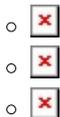
... *show files* of zactrack APP and SERVER are synchronized

... The local *show file* in your zactrack APP is newer than the one on the zactrack SERVER → **THE SHOW FILES ARE NOT IN SYNC**

... The local *show file* in your zactrack APP is older than the one on the zactrack SERVER → **THE SHOW FILES ARE NOT IN SYNC**

Upload / Download Show

- Tap on one of these icons to open the “Upload / Download Show” dialog shown below



Uploading: For uploading a new *show file* to the zactrack SERVER tap the Upload to Server button.

Downloading: For downloading the *show file* from the zactrack SERVER tap the Download from Server button.

Specific Download: You can download an older *show file* or parts of it by

- tapping choose version to download an older *show file* or pick specific elements of older *show files*,
- choosing the specific show (parts) you want to download, and
- tap the Import button.



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Validate Points

This function calculates the position of a target you are aiming at with your measuring tool.

1. [Set up the LEICA Disto S910](#)
2. Go to Show Editor and tap Validate in the Points Section
3. Tap Disto and aim the laser on the the target you want to validate
4. Tap Measure

Note: Tablet will BEEP after successful measurement and calculate the coordinates of the target automatically

5. Tap Done to finish this process

RELATED TOPICS

- [Define origin on stage](#)
- [Validate Points](#)
- [Measure Points](#)

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Last update: **2018/07/26 21:35**



Set up the WIFI network

Configuration of WIFI Access Point:

- Encryption: **WPA2-AES**
- SSID: zacktrack (or own preferred name)
 - Gateway: 172.20.1.1
 - Subnet Mask: 255.255.0.0
 - DHCP Server Range: 172.20.1.100 - 172.20.1.199

Please connect the WIFI Access Point to the zacNET network!

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<https://manual.zacktrack.com/doku.php?id=manual:wifi>

Last update: **2021/06/24 16:45**



Set up the zacktrack Puck



Connect zacktrack Puck to zacktrack WIFI

- Turn on the zacktrackPuck with the switch at the bottom.
- The LED indicates the state (green flashing → connected to network)
- The zacktrackPuck is now ready for fixture alignment

Note: If the LED indicates blue continuously → no known wifi network is found and own zacktrackPuck WIFI will be enabled. Klick the following link to [Configuration of zacktrack Puck WIFI network](#)

Recommended settings of zacktrack Puck

- Setup ip address: 192.168.4.1
- Recommended ip address: 172.20.1.211
- Standard Gateway: 172.20.1.1
- Subnet: 255.255.0.0

Configuration of zacktrack Puck WIFI network

If the LED shines continous blue search for a zacktrackPuck network on your device.



1. Connect your device to the network and wait for a few seconds.
2. A pop-up brings you to the zacktrackPuck config window. (You can type 192.168.4.1 in your browser to go there manually)



3. Press the  Button to scan for availabe networks.
4. Choose a network by tapping on it or entering the SSID.
Put in the password and tap save.

Note: If your desired network is not shown you can hit the scan button to rescan or enter the SSID and password manually.



1. List of all available networks (Standard WIFI → "zacktrack")
2. Credentials of chosen network

3. zacktrack Puck network settings (default settings should remain unchanged)

If the configuration succeeded the following dialog comes up:



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<https://manual.zacktrack.com/doku.php?id=manual:zacpuck>

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zactrack Manual

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Last update: **2018/07/26 16:38**



zactrack 3 APP

- [Connect the client to zactrack CORE](#)
- [Upload / Download Show](#)
- [Menu](#)
 - [New Show](#)
 - [Import Show](#)
 - [Export Show](#)
 - [Show Settings](#)
 - [System Settings](#)
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