Protect
FAST

TERRA 4D Configurator

Release 2.8

User Guide

extend your view
4D
T E R R A 4D

Contents

1 Introduction

TERRA 4D is a security and safety management software. It comes in two parts:

- The Viewer, used for control and operation tasks.
- The Configurator, used for the configuration of all system setting, assets and devices.

This User Guide gives you all the information necessary for successfully operating the TERRA 4D Configurator.

<u>Note</u>: The availability of program functions depends on the actual setting of user rights. Some functions may not be available to every user. The User Guide describes the full range of functions.

1.1 About TERRA 4D

TERRA 4D is a geo-referenced security and safety management software.

TERRA 4D is applied to protect people, property and critical infrastructure assets.

TERRA 4D converges all your security cameras, sensors, subsystems, data sources and operating procedures into a single unified and comprehensive platform.

TERRA 4D integrates multiple security and safety applications and controls them through an intuitive user interface, providing for greater overview and quicker response.

TERRA 4D allows the presentation of various data sources in a layered 3D geographical visualization.

With TERRA 4D, you

- monitor all security-relevant activities in real time, indoor and outdoor
- manage intruder alarm, fire detection, production control, building management and other systems
- access live and recorded sensor and subsystem data
- replay all data including video in time-synchronized fashion
- coordinate security interventions and staff

With TERRA 4D, you will

- improve overall security

- reduce risk

- increase efficiency

1.2   Safety and Compliance

TERRA 4D is capable of controlling the movement of cameras and other safety installations. It is also a tool for comprehensive outdoor and indoor surveillance.

> **!**   **Personal requirements**
>
> TERRA 4D may only be operated by especially informed and trained personnel.

> **!**   **Moving equipment**
>
> When operating TERRA 4D, always take care that no damage is done by moving cameras, doors or barriers.

> **!**   **Legal restrictions**
>
> When operating TERRA 4D, always act in compliance to legal and company regulations regarding personal and data privacy.

1.3   About this User Guide

Symbols and Styles

In this User Guide, the following symbols and text styles are used.

- Elements of the user interface, like buttons and input fields, are shown in **bold** characters.

- System messages, directories and files are shown in *italics*.

- Emphasized text is <u>underlined</u>.

- Cross-references and links are <u>blue and underlined</u>.

Content

Printable manual and online help feature the same content.

Online Help

Use the navigation tree to browse the contents of this help system.

By clicking at the **Help** icon in the programs user interface, the online help system will come up with the topic related to the current screen or function.

Feedback

Please do not hesitate to contact FAST Protect for feedback on this User Guide. See the appendix for contact information.

2 Start and Setup

This section describes how to start and exit the TERRA 4D Configurator and how to adjust basic settings.

2.1 Starting Up

Provided that the software has been successfully installed and the login credentials are known, begin working with TERRA 4D by first starting the client and then the Configurator program.

If the client and/or the Configurator is already running, please skip these steps.

Client Startup

Start the TERRA 4D client from the Windows Start menu. This tray icon will appear:

Click the icon with the right mouse button and select **Login...**

In the login window, enter the requested data.

Configurator Startup

Start the TERRA 4D Configurator from the Windows Start menu.

The Configurator window will appear.

Exit

Quit the Configurator by selecting **Exit** from the **File** Menu.

It is also possible to log out from the client via its context menu.

Shift Changes

Whenever an operator is replaced by another, a logout and a login should be performed. The Configurator will stop after logout, but restart immediately after login with the previous layout and status.

Server Connection

While the TERRA 4D is running, it is connected with a server. If for some reason this connection gets lost, a message will pop up stating this fact. Under normal circumstances a short connection loss will be resumed automatically and no data gets lost. If on the other hand the connection can not be reestablished after a short time, the TERRA 4D and client software should be quit and restarted after the connection has been checked and reestablished. In this case all data after the connection failure will be lost.

2.2   Settings
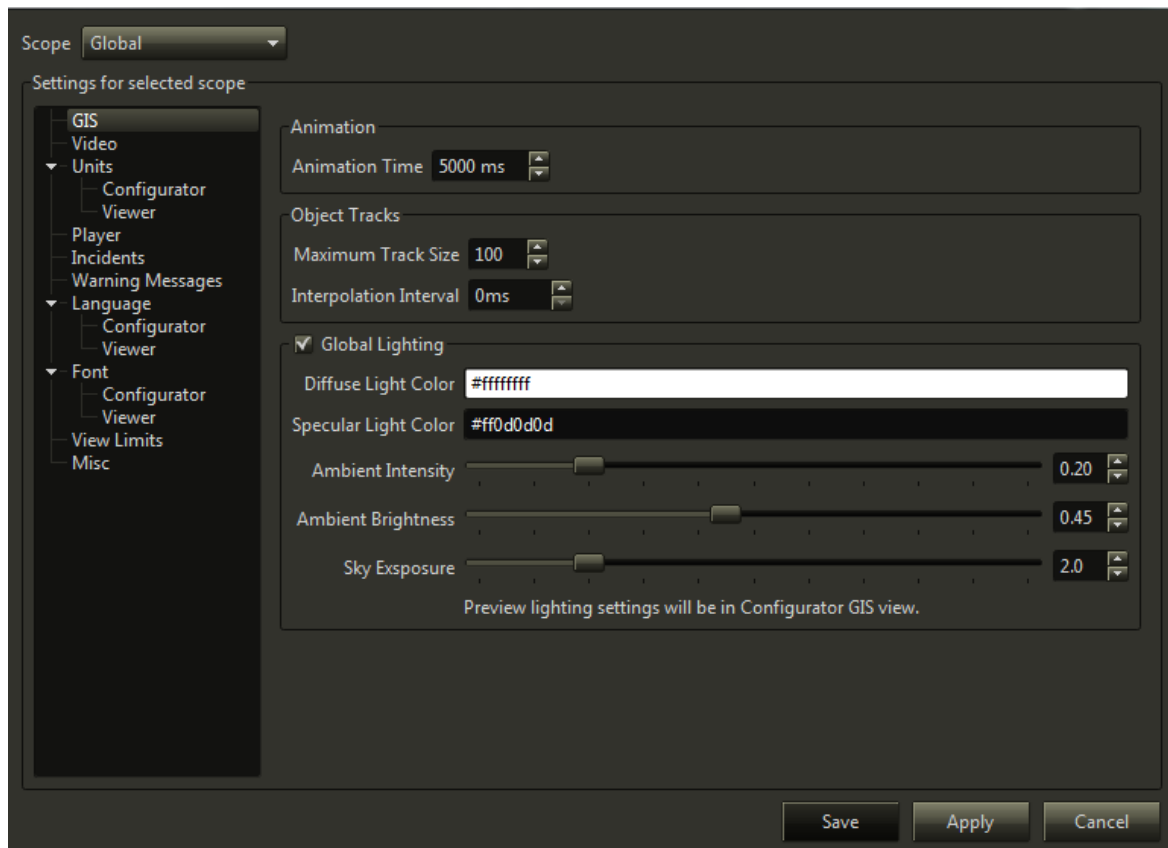
Select **Tools – Settings** from the menu. The **Settings** window appears where you can change various program settings. Click **Save** to save the changes and close the dialog or **Cancel** to close without saving.

Note: Normally it is necessary to restart the application after saving. A window will appear to remind you of that fact.

Scope

Some settings can be changed on a scope level to override global settings for a specific client workstation or user:

Global	These settings are used if no different setting is set in the other scopes.
User	If a setting is changed on this level, it overrides the global setting for the specified user.
Client Workstation	If a setting is changed on this level, it overrides the global setting for the specified client workstation.

Note: Not all settings are available to override in the different scopes.

2.2.1 GIS

Timing

Setting	Default Value	Comment
Animation Time	5000 ms	Setst the time the Configurator uses for animations like moving to a new selected placemark
Medialink Backlog Time	86400 s (1 d)	Sets the time after which medialinks will disappear from GIS views

Object Tracks

These parameter handles the visualization of object movements.

Setting	Default Value	Comment
Maximum Track Size	100	Set the maximum number of points per track. If exceeded the oldest will be deleted.
Interpolation Interval	100 ms	Describes in which time interval a new virtual tracking point will be set on the way to the next real tracking point

Global Lighting

If enabled, the global lighting will have an effect on ambient, diffuse and sky lighting. The settings will be set immediately to the Configurator 3DView in order to preview the settings.

Setting	Default Value	Comment
Diffuse Light Color	#ffffffff	Color of the light source (sun).
Specular Light Color	#ff0d0d0d	Color of the light reflected by certain materials, especially mirrors or windows.
Ambient Intensity	0.20	Defines the amount of ambient light is used. Decrease this number to increase the amount of light from the sun is used to light the scene.
Ambient Brightness	0.45	Overall brightness of the GIS view without the sun as light source. Increasing this number increases the overall brightness and reduces the shadow effects.
Sky Exposure	2.0	Defines the lighting of the terrain by the sun. Increase this number of increase the brightness of the terrain.

2.2.2 Video

Minimum Picture Interval

These parameters defines the update rate of the video windows.

Setting	Default Value	Comment
Normal Mode	200 ms	Time interval for the Configurator to update the GUI.
Native Mode	0 ms	Time interval for Video Management Systems like Alpha to update.
Pause Mode	600000 ms	Time interval at pause mode.

PTZ Tracking

These parameters sets the vertices of PTZ tracking commands and object following.

Setting	Default Value	Comment
Zoom Factor	4.00	This factor defines the size of a tracked object. 4.00 means 1/4, 10.0 means 1/10 of the screen size.
Minimum Change Area	0.3	The minimum difference for the PTZ camera to follow the move command.
Object Timeout	5000 ms	If an object is in tracking, this time defines the time the camera is fixed at this object after the last change, until another object could be tracked. If a change is recognized in this time the tracking continues.
Minimum Change Interval	300 ms	The move commands need this time interval between them to be accepted.

PTZ Misc

This parameter is used to regulate the access for a PTZ camera.

Setting	Default Value	Comment
Lockout time	5000 ms	If an operator uses a PTZ camera, this is the time to expire before another operator can control the camera, if no movement command is sent in this time.

2.2.3 Units

Units Settings

These parameter defines the representation of values for Configurator and Viewer separately. At every unit a drop down list is available to select the unit for the different values. At the table the default unit and the precision are listed.

The following units are possible:

Angle	BAM, Degrees, Sexagesimal, Mils (NATO), Radians
Length	Milimeters, Centimeter, Meters, Kilometers, Inches, Feet, Feet (U.S. Survey), Fathoms, Yards, Kilofeet, Kiloyards, Miles, Miles (Nautical), Data Miles
Speed	Feet per Second, Meters per Second, Yards per Second, Kilometers per Hour, Miles per Hour, Data Miles per Hour, Knots, Kilometers per Second
Time	Microseconds, Milliseconds, Seconds, Minutes, Hours, Days, Weeks

Setting	Default Unit	Precision	Comment
Linear (Distance)	Meters	3	Defines the unit for distances (auto conversion setting is possible).
Linear (Height)	Meters	3	Set in which unit heights are shown (auto conversion setting is possible)
Areal	Square Meters	3	Defines the unit for square measure (auto conversion setting is possible).
Volume	Cubic Meters	3	Defines the unit for volumes (auto conversion setting is possible).
Angular	Degrees	8	Set the unit for angles
Temporal	Minutes	2	Defines the unit for time.
Speed	Meters per Second	2	Set the unit for speed of moving objects.

GPS Position Representation

Setting	Default Value	Comment
LAT/Lon	decimal	Defines how the GPS position is displayed. Select the button at the right to choose between the four possible representations: *decimal*, *degree*, *separate decimal* and *separate degree*. <u>Note</u>: the value shown is only an example and will not be saved

Conversion Datum

Add one or more conversion data by selecting the desired system from the combo boxes. To remove a selected system, select *'None'* from the box and the UI element will disappear.

Currently selectable conversion data are all 60 UTM zones north and south as well as ITM and ICS grids.

The selected conversion data will show up in the Viewer inside the *'Find address'* dialog as separate tab

2.2.4   Player

Playback

These parameter defines the visualization at playback mode.

Setting	Default Value	Comment
Timer interval	200 ms	Time interval for updating the objects.
Zombie Time	60 s	Time before an inactive virtual object will be removed from system.

2.2.5   Incidents

Alarm Notification Level 1/2/3

With these parameter you can define which visualization should draw attention to the operator that an alarm occurs.

Setting	Default Value		Comment
Priority	Level 1	1	This defines, which settings for the notification will be used, if an alarm with a specified priority occurs. The values defines the minimum to reach a level, so an alarm with priority 7 will get the settings of level 2, which apply at priority 5-8.
	Level 2	5	
	Level 3	9	
Duration	Level 1	5s	The time of the frame blinking at the alarm levels in seconds [s].
	Level 2	60s	
	Level 3	3600s	
Frame color	Level 1	▮ (yellow)	Select the color of the blinking frame at the alarm levels. Click at the three dots to open a **Color Select** window
	Level 2	▮ (red)	
	Level 3	▮ (red)	
Audio file	Level 1	[Empty]	Select an audio file for playing if an alarm when this level occurs. Click at the three dots to open a Resource File Dialog.
	Level 2	chimes.wav	
	Level 3	notify.wav	
Snooze time after creation	0min for all levels		Time after silencing the incident alarm to rise the alarm again. *Note:* Zero (0) seconds will turn snoozing off.
Snooze time after processing	0min for all levels		Time after starting to process an alarmed incident to rise the alarm again. This alarm will be postponed after every change that has made to the processing incident. *Note:* Zero (0) seconds will turn snoozing off.

Autoclose

Setting	Default Value	Comment
Finished workflows	unchecked	If checked, a finished (valid or false) incident will close its workflow automatically.

2.2.6   Warning Messages

Configurator Warnings

Chose whether these warnings will be displayed:

Setting	Default Value	Comment
Warn before switching Highlevel / Customl script level	Selected	If switching from high level to custom script level (or vice versa) in the script environment, a warning message will appear
Warn if trash contains device(s) on exit	Selected	If deleted devices are in the trash, a warning message will appear when closing the Configurator

Viewer Warnings

Chose whether these warnings will be displayed:

Setting	Default Value	Comment
Send GPS Position on intervention	Selected	If a GPS position is added to an intervention message, a warning will appear to verify the send position manually
Stoping intervention	Selected	If you want to stop an intervention, a warning will appear to verify the end of the intervention.
Overwrite Placemark while editing	Selected	If a placemark is edited with the option **Update view**, a message will warn that the placemark view will be changed permanently

2.2.7   Language

Language

Set the application language for Configurator and Viewer separately.

Setting	Default Value	Comment
Language Code	English (General)	Set the language of the application. A restart is necessary to activate the language.

2.2.8   Font

Fonts

Set the application font for Configurator and Viewer separately.

Setting	Default Value	Comment
Application Font	Segoe UI,9,-1,5,50,0,0,0,0,0	Select the font to use at the application. Press the three dots to open a **Select Font** window.

2.2.9   View Limits

View Limits

Setting	Default Value	Comment
Maximum of video views	200	Maximum number of video views that can be displayed simultaneously in the Configurator. When the number is exceeded, only a placeholder will be displayed. The number should be adjusted to the systems computing power.
Maximum of GIS views	4	Maximum number of GIS views that can be opened in the Configurator
Maximum views in dynamic video window	100	Maximum number of views that can be opened in the dynamic video window of the Configurator

2.2.10   Misc

DXF Import (Configurator)

Parameter to handle a DXF Import.

Setting	Default Value	Comment
Floor Texture Edge Length	25m	A floor can use multiple texture tiles depending on the size of floor. This number defines the maximum size of one texture tile. Decreasing this number results in more detailed textures, but also increases the amount of memory required to hold this texture in the GPU.
Floor Texture Pixel Size	1024px	Defines the number of pixels used by each texture tile. Increasing this number results in higher GPU memory usage.

Toolbars (Viewer)

Setting	Default Value	Comment
Auto hide	Unselected	If selected, the tool bars in the media windows like video or 3DView will only show up if the mouse pointer enters the media window.

3 User Interface
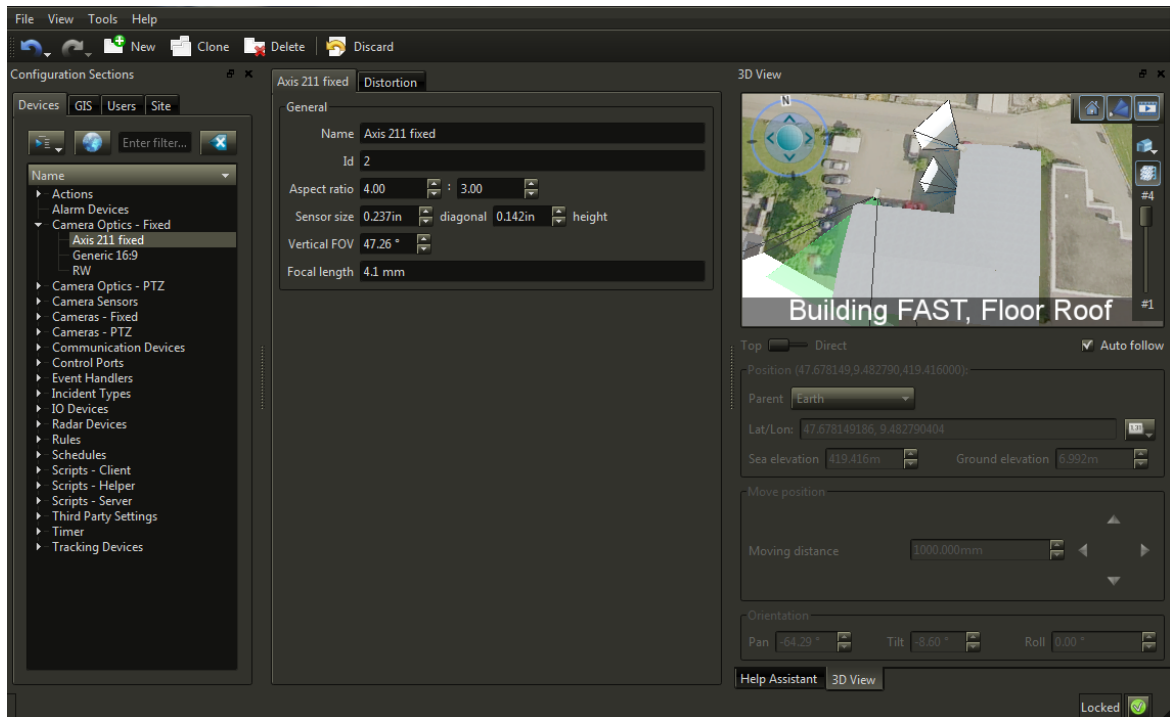
This section explains the basic functions of the user interface. It contains some Basic GUI Elements and a Main Window which is separated in three sections.

3.1 Basic GUI Elements

This chapter describes the basic elements of the Configurator window.

3.1.1 Menus

The Configurator contains following menus:

File Menu

Exit   Quit the Configurator

View Menu

**Configuration   Toggles the visualization of the device tree window
Sections**

3D View   Toggles the visibility of the GIS model window

Help Assistant   Toggles the visibility of the Help Assitant

Main Toolbar   Enables/Disables the Main Toolbar under the menu

Stereo Mode   Toggles between the normal mono and the stereo mode, if available

Tools Menu

Trash...	Opens the Trash dialog
Purge Files ...	Opens the Purge Files dialog
Import...	Opens the Device Merge Tool.
Script Logging...	Opens the Script Logging window
Settings...	Opens the Program Settings
Input Devices...	Opens the Input Devices

Help Menu

Auto follow	If selected, the help assistant will show a suitable help page for the current selected device type and page.
User Guide	Opens the user guide for the Configurator.
About	Shows information about the Configurator

3.1.2 Toolbar

The main toolbar gives quick access to some often used features. The appearance of some buttons depends on which part of the device-, GIS- or user-tree are selected. At a node, **New and Delete** are available, at a device all buttons appear.

Configuration history list. Goes backward to previous or forward to next configuration page.
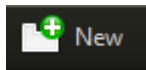
New Add a new device to the node and open the configuration window for this device.
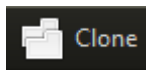
Clone Clone a selected device and open the configuration window for this new device. The new device will get the same name, added with "(copy)", and all properties, but with a new device ID.

Delete Delete the selected device. Note: There will be no warning before the device is deleted, but it will remain in the trash until the Configurator gets closed.
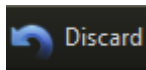
Discard Discard the changes at the selected device. Note: this only works so long you have the device selected. Select another device saves the changes permanent.

3.1.3 Windows

The Configurator window consists of the menu, the toolbar and a number of sub-windows of various types. Any window can be moved to any location of the screen. It may be either docked (lining up with other windows), stacked (selectable via tabs below) or undocked (floating above other windows).

Window controls

A windows can be moved by dragging it with a mouse the by their upper frame (title bar). In multi-screen setting, windows can be dragged across all screens.

A window can be controlled by clicking the icons located in its upper right corner:

Undocks a windows.

Closes a docked window.

Closes an undocked window.

To dock an undocked window, drag it to the desired location and the release the mouse button.

Windows can be re-sized by dragging the sliders between adjacent windows.

By clicking on the title bar of window, a small menu pops up where you can toggle the views like in the **View** menu.

3.2   Main Window

The main window is separated in three different sections:

- **Configuration Section** – Show list of devices, GIS categories and user categories in separate tabs.

- **Property Section –** Show the list of the selected item in the configuration section. By selecting a root of a device tree, a list of all devices with multiple columns, depending at the kind of device, will be shown.
  By selecting a single device, the option configuration details of this device will be shown.

- **3D View** – Show the area the device is placed in the GIS model.

- **Help Assistant** - Show an interactive version of this manual

3.2.1 Configuration Section

In the **Configuration section** select the device tree and the device to work on it. At the top there are 3 tabs with the subgroups **Devices**, **GIS**, **Users** and **Site**. Below this are some buttons.
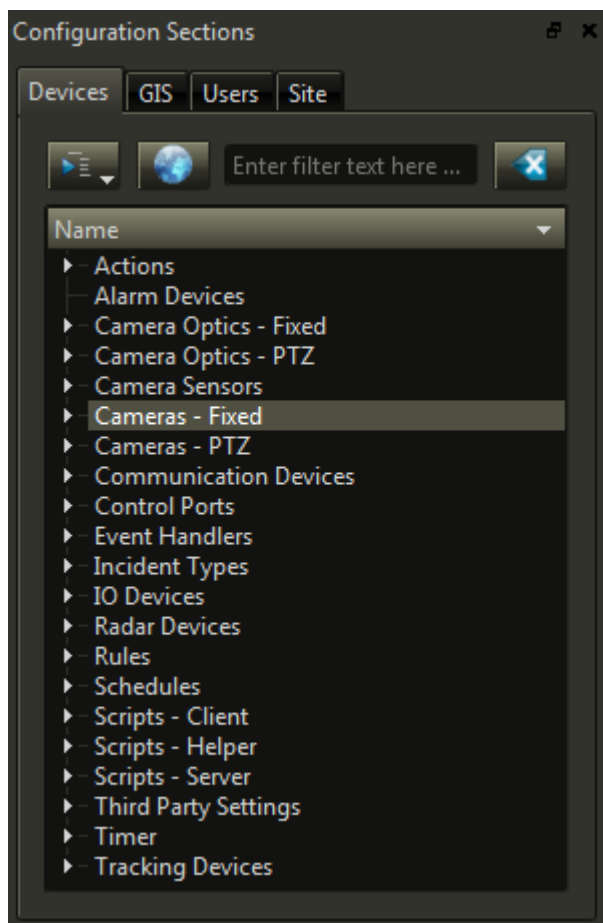
Device tree

Hint: In order to expand or collapse all items in the tree, hold down the 'ALT'-key while clicking on any triangle beneath an item.

Buttons

	Device type
	Filters the entities depending on the current 3D view (only available where applicable)
Filter text	Inserts a search text to filter the list. It is not case sensitive.
	Clear the filter input field left of the button

The **Configuration Sections** shows **Devices**, **GIS**, **Users** and **Site** data in different tabs.

Device Tree

If devices are defined for a type of device, an arrow is shown to expand the root tree node and will show all devices. Select a type root node to show the list of devices as Property Grid

Icons

At every device a state icon is shown. The possible states are

	The device is operational.
	The device has an error.
	The device is disabled.
	TERRA 4D is trying to get the state of the device.
	The default alarm icon, when an alarm appears.
	An alarm is pended.
	The alarm is finished (valid or false).
	The relay is switched on.
	The relay is switched off.
	An incoming call is recognized.
	An outgoing call is recognized.
	An incoming SMS is detected.
	An outgoing SMS is detected.
	Placemark icon.

Context Menu

The contextual menu for a root node consists of following item(s):

New   Create a new entity of the same kind like the node.

For a specific device the contextual menu may differ. Some of the menu entries are standard, some are depending on the kind of object and some are defined inside the **Action** tab in the **Property Section** of the selected object if applicable.

These are the most common entries:

Clone	Create a copy of the selected entity with almost the same values, only internal values like device ID are different. The cloned entity get the same name added by "(copy)"
Delete	Delete the selected entity.
	Note: There will be no warning!
Initially enabled	Here the device can be enabled/disabled directly.
Show direct	The viewing in the **3D View** moves to the place of the entity and looks into the direction given by the orientation of the entity, if possible.
Show from top	The viewing in the **3D View** moves to the place of the entity and shows it from above.
Show from behind	The viewing in the **3D View** moves to the place of the entity and shows it from behind, looking in direction of the entity, if possible.
Add filter	Add a filter device. Some devices have the possibility to filter the incoming data, for example a Tracking Device. This way it is possible to distinguish between different objects based on the same device, for example to concatenate them with different avatars.
Add sub layer group	Adds a sub Layer Group to a Layer Group.
Add layer	Adds a Layer to a Layer Group.
Add building	Adds a Building to a Vicinity.
Add floor	Adds a Floor to a Building.
Add room	Adds a Room to a Floor.

3.2.2   Property Section

In the **Property Section** there is the Property Grid or the Device Properties. The content of each page is depending on the available data.
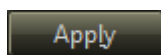
Apply

If a device with a *Type* field is selected, a group box with dynamically - type depending - changing properties and an **Apply** button will appear. This button applies changed dynamic properties to the device. Changes will also be saved by selecting another device.

3.2.2.1 Property Grid

The property grid gives a good overview as well as the possibility to copy properties of one specific device to one or more other devices.

Property Grid (in this case from the Camera section

The grid

In order to filter the grid data by any text a text filter is present in each grid. Some grids provide filter buttons to toggle the visibility of the property groups.
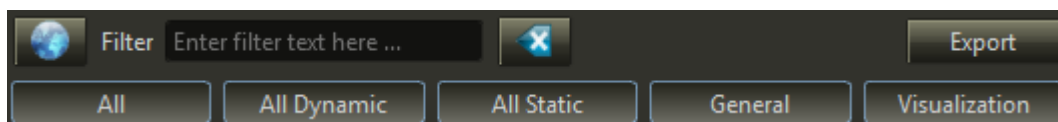
Header of property grid

     Filters the entities depending on the current [3D view](#)

Filter text   Inserts a search text to filter the list. It is not case sensitive.

     Clears the text filter field to show all entities again.

Export   Exports currently shown grid data into an HTML file.

All   Shows/Hides all properties except *Id, Name* and *Number*

All Dynamic   Shows/Hides all dynamic properties. Dynamic properties are allowed to be empty, and depend on the type of the entity.

All Static   Shows/Hides all static properties. They depends on the kind of the entity.

General   Shows/Hides general properties. These are a subset of static properties.

Group Button(s)   Shows/Hides properties for another group. Depending on the device type one or more group buttons representing a subset of static properties will be shown.

The properties of the devices are shown in columns, depending on the filter sets.
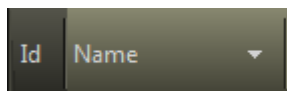
Select a column header to sort the grid by that column The arrow shows the sorting order; click at the header again to invert the order. For better overview it is possible to 'freeze' either or all of the columns *'Id'*, *'Name'* and *'Number'* by selecting the respecting column in the contextual menu. A frozen column will not disappear if the grid is scrolled to the right.

It is possible to edit the values directly in the grid cells.

Note: The Id is generated by the system and therefore not editable.

To edit a

Color field:	Double-click to enter a **Select Color** dialog.
Checkbox:	Check one or more of the boxes. If only one choice is allowed, the others will be cleared.
Drop down list:	Double-click to enter an editor and select desired entry.
Multiple drop down list:	Double-click to enter an editor and select desired entries.
Text field:	Double-click to enter an editor and change the text.

Copy and Paste Properties

To copy one or more properties, select the desired properties and press **'Ctrl+C'** or select **'Copy selected properties'** from the context menu. After that choose the devices to paste the copied properties to and press **'Ctrl+V'** or select **'Paste properties'** from the context menu. It does not matter if you select the correct column(s) in order to past the copied properties as the system will paste the copied properties into the correct ones automatically.

Note: At the same time properties are copied they are copied into the systems clipboard as well. This way a simple export of a subset of properties into e.g. Excel is possible.

Context Menu

The contextual menu for a selection consists of following items depending on single or multiple selection:

Copy selected properties	Please see section [Copy and Paste Properties](#)
Paste properties	Please see section [Copy and Paste Properties](#)
Edit object	By selecting this entry the corresponding configuration page of the row device will be selected for editing. *Note*: Same can be achieved by double clicking the first cell in the row representing the devices **Id**.
New	Create a new entity of the same kind like the node.
Clone	Create a copy of the selected entity with almost the same values, only internal values like device ID are different. The cloned entity get the same name added by "(copy)"
Delete	Delete the selected entity. *Note*: There will be no warning!
Initially enabled	Here the device can be enabled/disabled directly.

3.2.2.2 Device View

The available properties are grouped in one or more tabs.
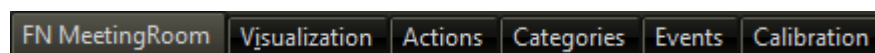
Tabs example: Fixed camera "FN MeetingRoom"

The first tab contains general properties and is named like the selected device, other tabs are device-depended and will be described in [Device Properties](#). Inside the tab pages the properties are ordered as in the [Property Grid](#).

3.2.3   3D View Section

If a device is referenced to a coordinate in the world, the **3D View Section** will be used to configure the representation in the GIS view. Only possible options are enabled.
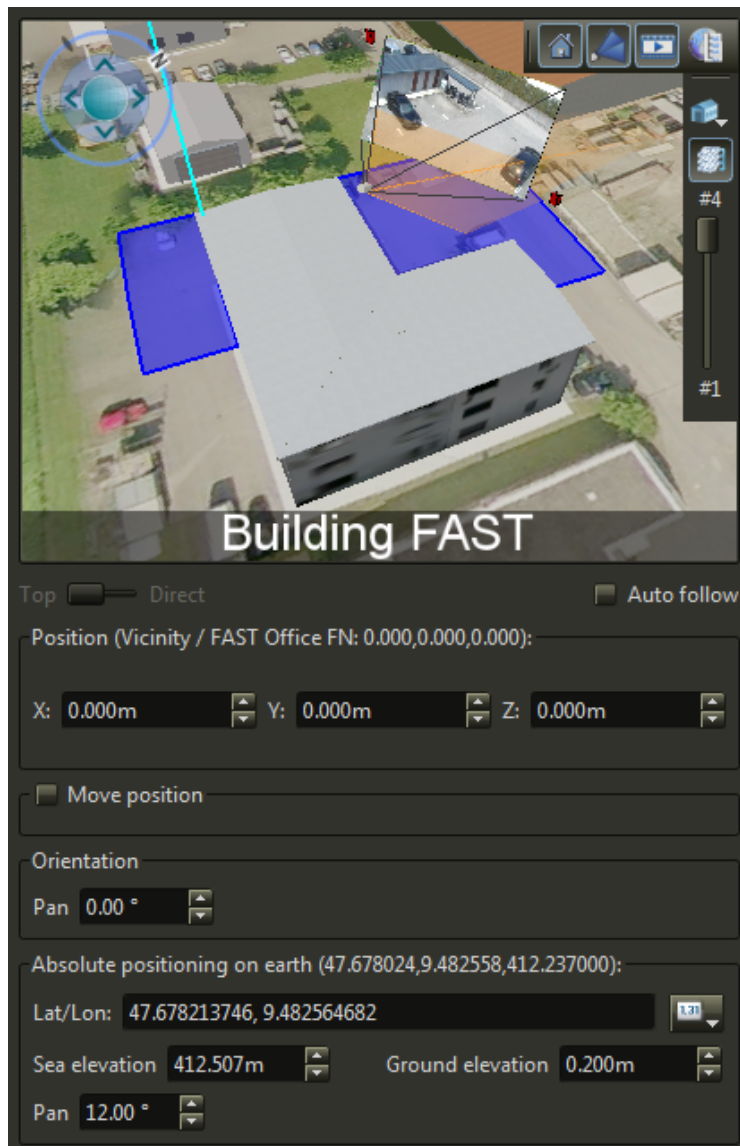
A PTZ camera at FAST Building including videowall, frustum and alarm zone.

Toolbar (Horizontal and vertical)

In the *3D view* you have the button to control the visualization of buildings and cameras, if they would overlay the device you want to configure:

Hide/Show visualization of camera coverage

Hide/Show videowall

Layer selector

Select buildings which are configured in TERRA 4D to use the slider for opening up the building

If the slider is visible, use this button to switch between the slider behavior "floor" or "elevation". With "floor" you jump from one floor to the next, with "elevation", cut the building at any elevation.

Context Menu

The context menu of the 3D view contains some or all of the following items.

Note: If an object has been hit at the click point the name of that object will be shown on top of the contextual menu.

Edit object	If an object has been hit at the click point, by selecting this entry the corresponding configuration page will be selected for editing
Set position to this terrain point	Sets the position of the selected device to the coordinate clicked in the 3D view. This menu item is only available if a device is selected.
Place: Show from top	Set the 3D view to look from top on one of the listed locations.
Fixed Camera: Show from top	Set the 3D view to look from top on one of the listed locations.
PTZ Camera: Show from top	Set the 3D view to look from top on one of the listed locations.
POI: Show from top	Set the 3D view to look from top on one of the listed locations.
IO Device: Show from top	Set the 3D view to look from top on one of the listed locations.
Indoor Entities: Show from top	Set the 3D view to look from top on one of the listed locations.
GPS Coordinate: Show from top ...	Set the 3D view to any coordinate (e.g. one received from another person). The view is from top. The field is pre-filled with the clicked coordinate.

Property Sections

Under the *3D view* you have three elements directly affecting the view, a '*Position*', a '*Move Position*' and an '*Orientation*' area, which are only enabled at a device which utilizes these features. In the '*Position*' area place the device, in the '*Move Position*' area move the object conveniently and in '*Orientation*' area, define the direction of the device.

3D View Elements

Top / Direct   Show the place from top or from the view of the device.

Auto follow   Enable/Disable that the 3D View jumps to the place defined at the device

Position

Parent   Place the object relative to another defined place or directly on the earth.

Depending of the selected parent, the positioning controls will change, see Parent: Earth and Parent: Another place.

Move Position (Collapsible)
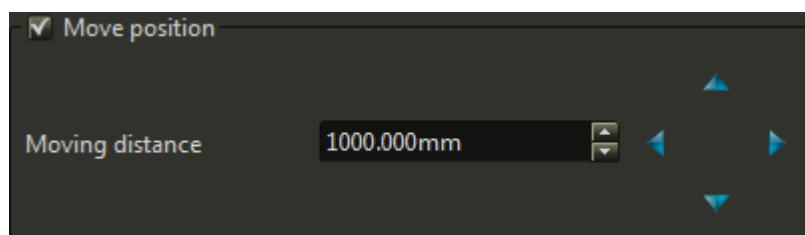
Moving distance   Choose the amount of travel for the object to move

Arrows   Move the object in the direction of the selected arrow, depending on the **Moving Distance**.

Orientation
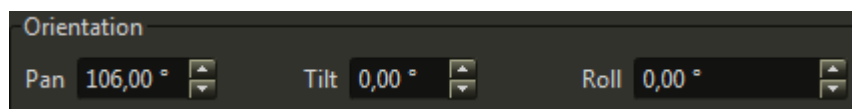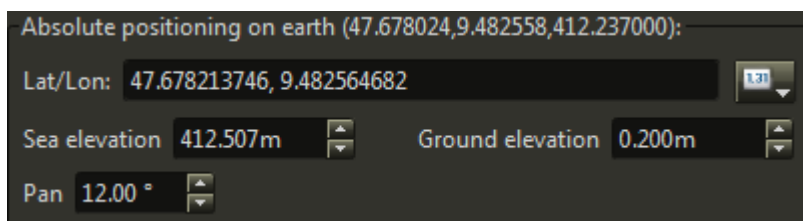
Orientation of a radar device

Pan   Set the pan angle in a range from -180 to 180 degrees.

Tilt   Set the tilt angle in a range from -90 to 90 degrees. *NOTE*: Only available where applicable

Roll   Set the roll angle in a range from -180 to 180 degrees. *NOTE*: Only available where applicable

Absolute positioning on earth (Only visible for locations with parent other than earth) [Read only]

Absolute position on earth of a building

Lat/Lon: The latitude and longitude of the object

Sea elevation The elevation above sea level

Ground elevation The elevation above ground
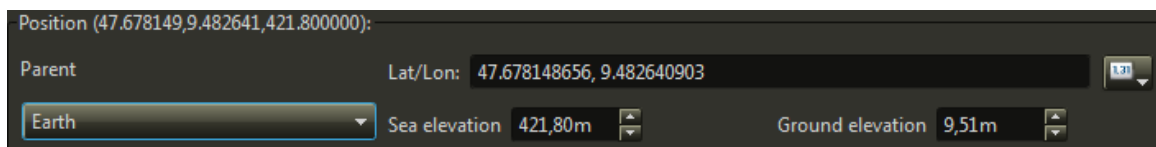
Pan The pan angle in a range from -180 to 180 degrees.

Tilt The tilt angle in a range from -90 to 90 degrees. *NOTE*: Only available where applicable

Roll The roll angle in a range from -180 to 180 degrees. *NOTE*: Only available where applicable

3.2.3.1 Parent: The Earth

By selecting Earth as parent, the coordinate of the place and the elevation, relative to the sea level or to the ground, are available.

The PTZ camera position relative to the earth

Lat/Lon The coordinate of the place.

Select the representation of the coordinate, two are possible: Decimals or Degrees. It is also possible to enter them in one field or in separated fields.

Sea Elevation Enter the elevation of the object relative to the sea level directly or use the small arrows to put it higher / lower.

Ground Elevation Enter the elevation of the object relative to the ground directly or use the small arrows to put it higher / lower.

3.2.3.2 Parent: An Entity

By selecting an entity as parent, parameters to move a location object relative to the position of the parent become available.

.

Position (2.474,14.814,9.563):
Parent [Building ▼] [FAST [FAST Office FN] ▼]
X: 2.474m   Y: 14.814m   Z: 9.563m

| **Parent** | At the left side, select the type of the parent like *Earth*, *Floor*, *Room*, *Sensor Platform, Vicinity* or *Zone*. Then you get the list of possible parents at the right side (except by *Earth*) |
| **X/Y/Z** | The distances relative to the selected parents zero point. Because the axes have a defined direction these values could be negative. |

3.2.4 Help Section

In the **Help section** the Configurator manual is displayed.

If the menu item **Auto select help topic** inside the **Help** menu is activated, the content will follow your device and tab selections.
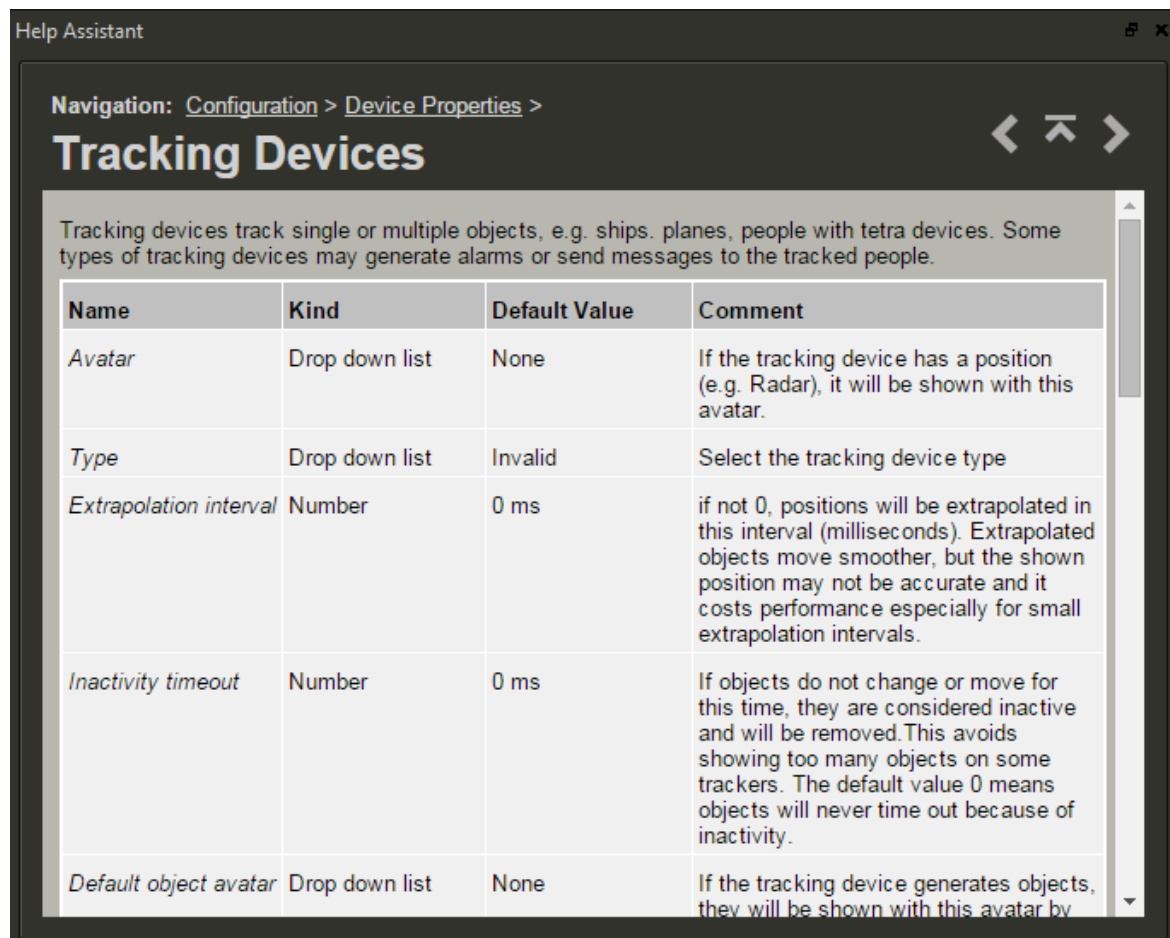
To navigate independent from a selection, use the three icons at the right side or click at a link inside the help content. Links to other chapters are marked blue.

3.3 Tools and Dialog Boxes

This chapter describes additional dialog boxes.

3.3.1 Trash
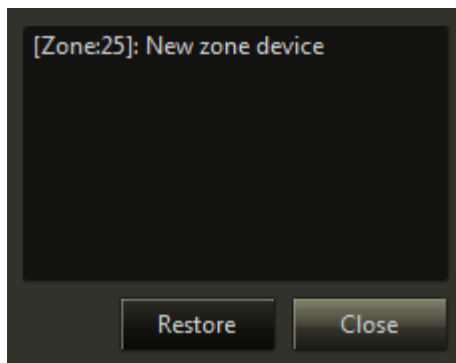
Select **Tools** – **Trash** from the menu to open the **Trash** dialog box.

In the trash dialog all devices that were deleted in the current session are listed. Deleted devices can be restored by selecting the items and pressing the **Restore** button.

When exiting the Configurator application a confirmation to delete the complete trash content appears if the trash is not empty. After confirmation, restoring is impossible.

3.3.2 Purge Files

In order to clean up the local computer from unused files (like e.g. automatically created *ive* files from the DXF import of buildings), the **Purge files** dialog can be used.
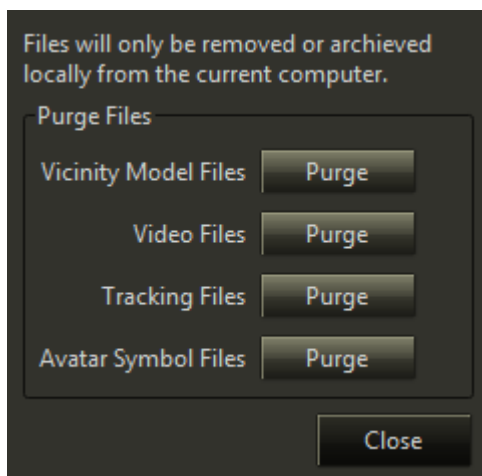
Purge files dialog

Select **Tools** – **Purge Files ...** from the menu to open the **Purge files** dialog box.

By pressing the corresponding **Purge** button different unused files can be deleted or archived on the computer running the Configurator:

Vicinity Model Files

To clean up the folder '*share/vicinitymodels'* from unused files (like e.g. automatically created *ive* files from the DXF import of buildings).

Video Files

To clean up the folder '*demo'* from unused video files.

Tracking Files

To clean up the folder '*demo'* from unused tracker files.

Avatar Symbol Files

To clean up the folder '*share/symbols'* from unused 3D files.

After pressing the **Purge** button a separate dialog will open:
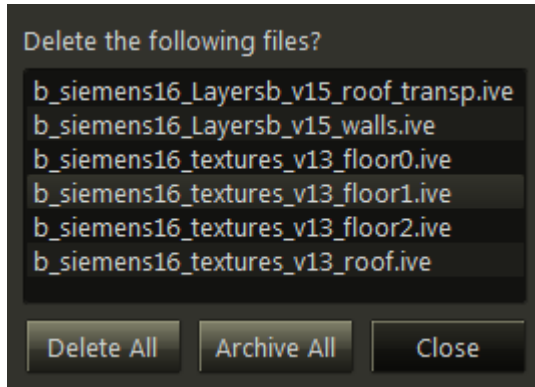
Example of purging vicinity model files

Inside the dialog all files are listed which are not used by any of these devices:

- Vicinity Model Files: Vicinity, Building, Floor, Room or Zone

- Video Files: Fixed and PTZ Cameras

- Tracking Files: Tracking and Radar devices

- Avatar Symbol Files: Avatars

- **Delete All** will delete all listed files from the local file system permanently.
- **Archive All** will move all listed files into a subfolder *'archive'* inside the respective folder. If the folder does not exist it will be created automatically. The user will be asked what to do if there are already files with the same name within this subfolder. He can choose to overwrite the existing file(s) or skip the moving of that particular file.
- **Close** will close the dialog without any changes.

3.3.3   Device Merge Tool
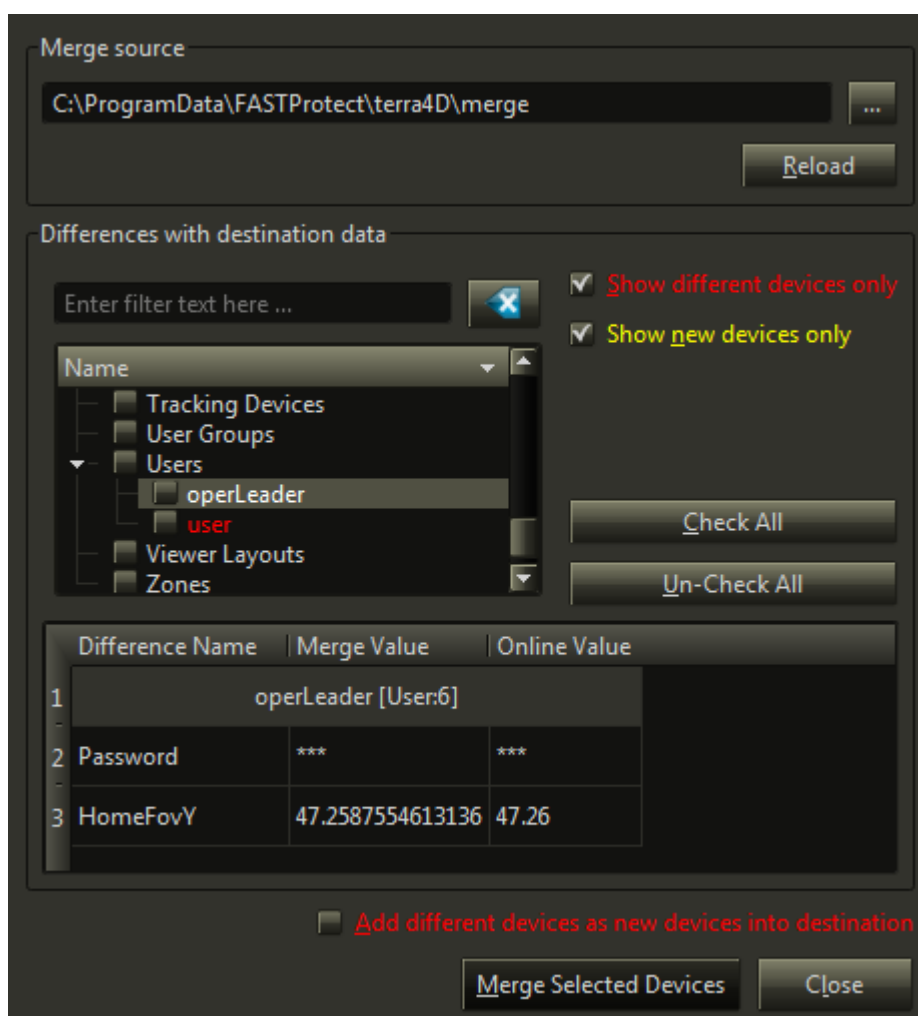
Select **Tools – Import** from the menu to open the **Device Merge Tool** dialog box. This tool merges new configuration files in the current environment. It recognizes conflicts and offers the possibility to decide if the configuration in the merge source directory is to use, overwriting the current. New configurations added to the existing ones following the rules for new devices like getting an unique identifier number.

Merge Source

Merge source path To import new files, first select the directory with the new configuration files. Type in the path directly or move to it with the button at the right side.

Reload   Reload the devices from the merge source directory.

Differences With Destination Data

Enter filter text here	Show only the devices with the text found in the name, in combination with the two **Show ... devices only** buttons.
	Clear the filter field.
Show new devices only	Suppress the existing devices of the current configuration.
Show different devices only	Suppress the new and unchanged devices in the view. .
Check All	Check all devices for convenience.
Un-Check All	Un-check all devices for convenience.

In the device tree all configurations groups existing in the current environment are visible. If at least one of the **Show ... devices only** check boxes is active, the entries with differences to the merge source directory shows a folded-out-arrow at the left side and the children lists the new entries (green color) respectively the ones with conflicts to the current configuration (red color). If none of the boxes are selected, all devices in the groups are visible, but only the groups with differences are folded out by default. Then the devices without changes are shown in white.

To select all devices of a group click at the checkbox button left to it. For a single one, click at his checkbox. In this case a "-" instead of a hook is show in the checkbox.

Click at a box with a hook to discard the selection.

Clicking at a red device name in the area under the tree shows the differences between the current (right side) and the new device (left side). At the first column (**Difference Name**) the name of the option with different values can be seen, the second column (**Merge Value**) shows the value in the configuration of the merge source directory and the third column (**Online Value**) shows the value in the current configuration.

Add different devices as new devices into destination	If you have an existing device in the merge source directory with different values selected, with this checkbox you decide to import these as new devices. Default is to overwrite the existing ones.
Merge Selected Devices	Merge the new values and new devices to the current configuration, if selected.
Close	Discard all changes not merged at this moment and close the window.

3.3.4 Input Devices

In order to use special input devices to control the 3D views in TERRA 4D it needs to be added and configured in this *input devices* dialog. Select **Tools** **– Input Devices** from the menu to open the dialog box.

The combo box shows the currently select input device or is empty when no input devices are configured.
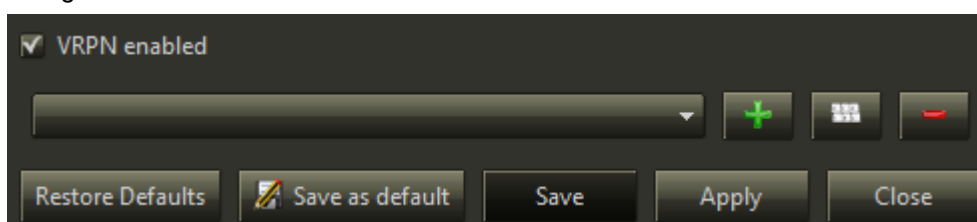
VRPN enabled	Must be checked to enable all input device functionality. This can be used to easily disable all input devices without changing the configuration of any input devices itself.
	Add a new input device.
	Changes the parameters for the selected input device
	Removes the currently selected input device
Restore Defaults	Discard the current settings and reload the defaults for all input devices.
Save as default	Save the current settings as defaults. When a new device of the same type is created these settings are used.
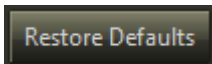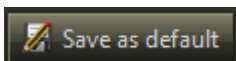
Add new device dialog

To add a new input device press the Plus button behind the combo box. And the following dialog box appears.

Device type: 3DConnexion Navigator

Device Name: dev0

Parameters

OK   Cancel

Within the dialog select the device type you want to add. The **device name** and **parameters** are automatically filled and usually do not need to be modified. Only change these values if you know want you're doing. Press OK to finish adding the device and being adjusting the device settings. When finishing the **Add new device** dialog the newly created device is selected in the combo box and a default configuration is loaded automatically.

Device info
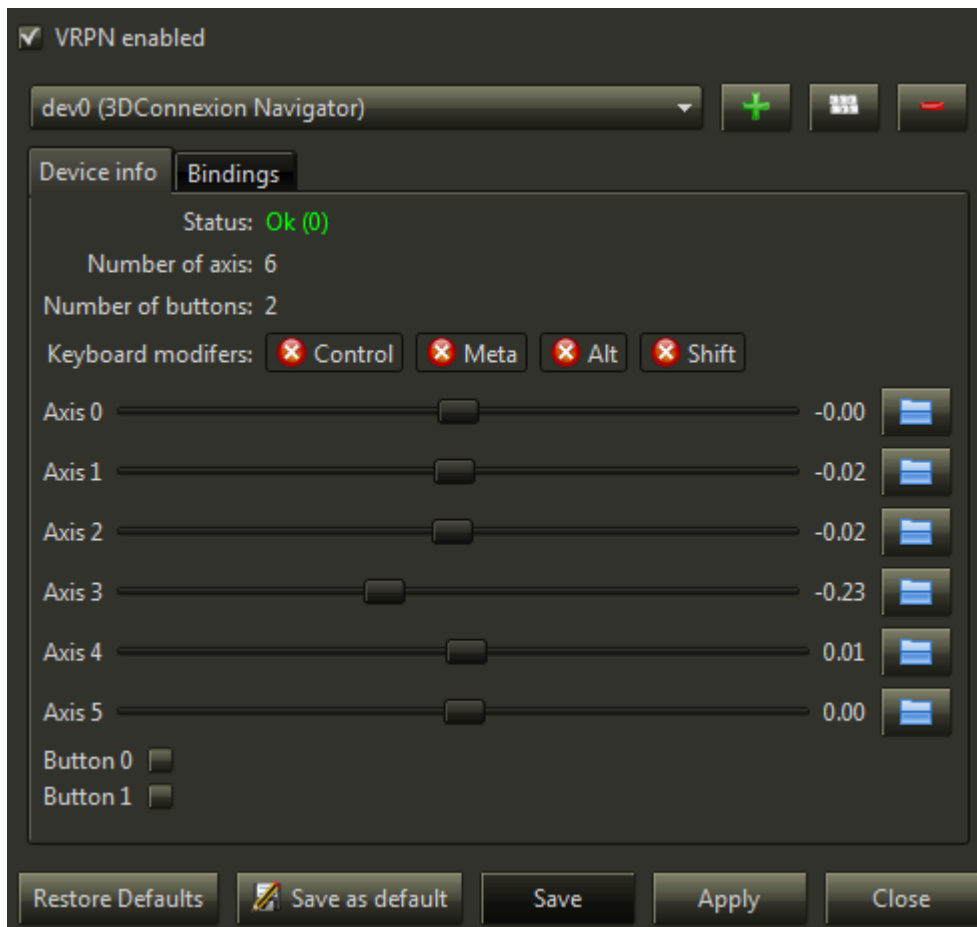
The device info tab shows the device status, the number of available buttons and axis of the selected device and the current status of the keyboard modifiers (**Control**, **Meta**, **Alt** and **Shift**). Below the general status information the status of each axis and button is shown in real-time.

For each axis the dead zone and the sensitivity can be configured by pressing the [ ] button.

Dead zone	A dead zone can be useful for device which do not have a well defined resting position like a joystick for example. When the value of an axis is changing without touching the device the dead zone value should be increased.
	If a dead zone is configured the value of axis must be greater than the configured value to trigger any input action.
Sensitivity	The sensitivity factor can be used to reduce or increase the effect of an axis.

The defaults for these values depend on the type of input device.

Bindings

To define which axis and which buttons trigger a specific action the bindings must be configured.
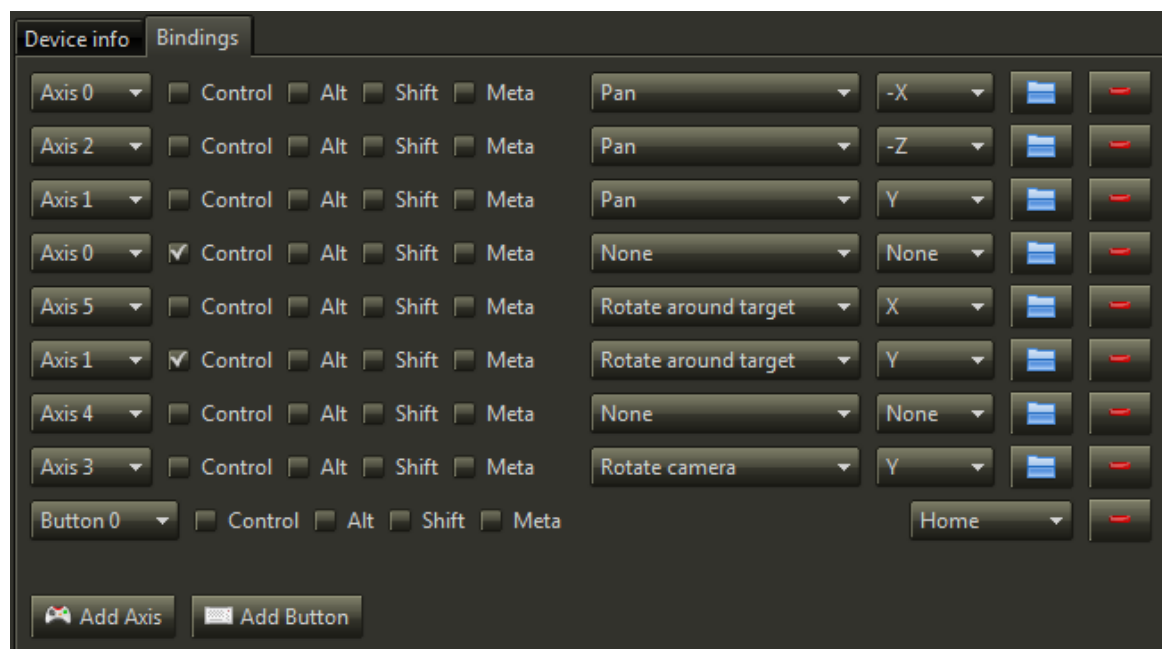
Axis combo box	Select the axis which should trigger an action.
Button combo box	Select the button which should trigger an action.
Control	Check if the **Control**-key on the keyboard must be pressed to trigger an action.
Alt	Check if the **Alt**-key on the keyboard must be pressed to trigger an action.
Shift	Check if the **Shift**-key on the keyboard must be pressed to trigger an action.
Meta	Check if the **Meta**-key or Win-key on the keyboard must be pressed to trigger an action.
Action combo box	For axis bindings actions like **Pan**, **Rotate** camera or **Zoom** are available. For button bindings actions **Home** or **Reset** are available.
	If the action **None** is selected no action is triggered.
Channel combo box	Only available for axis bindings; Selects the channel where the axis value is used for the selected action. E.g. the value from **Axis 0** is used as the negative X value for the **Pan** action.
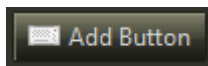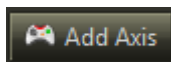
Axis combo box	Select the axis which should trigger an action.
	Opens the settings for the binding to configure a sensitivity factor.
	Removes the binding.
Add Axis	Adds a new axis binding.
Add Button	Adds a new button binding.

3.3.5 Script Logging

For logging scripts started e.g. via an event handler test button, the **'Script Logging'** window is very convenient. It shows all logging information of any running script in a floating window.
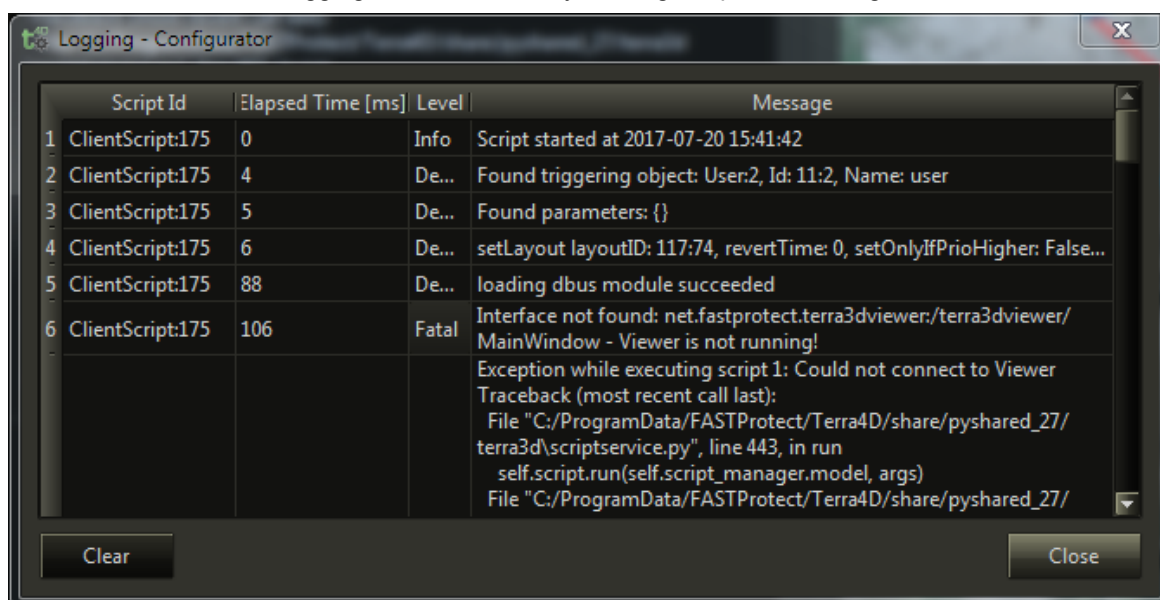
Example of logged script
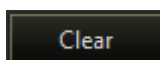
Clear	Clears the log output
Close	Closes the window
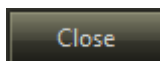
3.3.6   Resource File Dialog
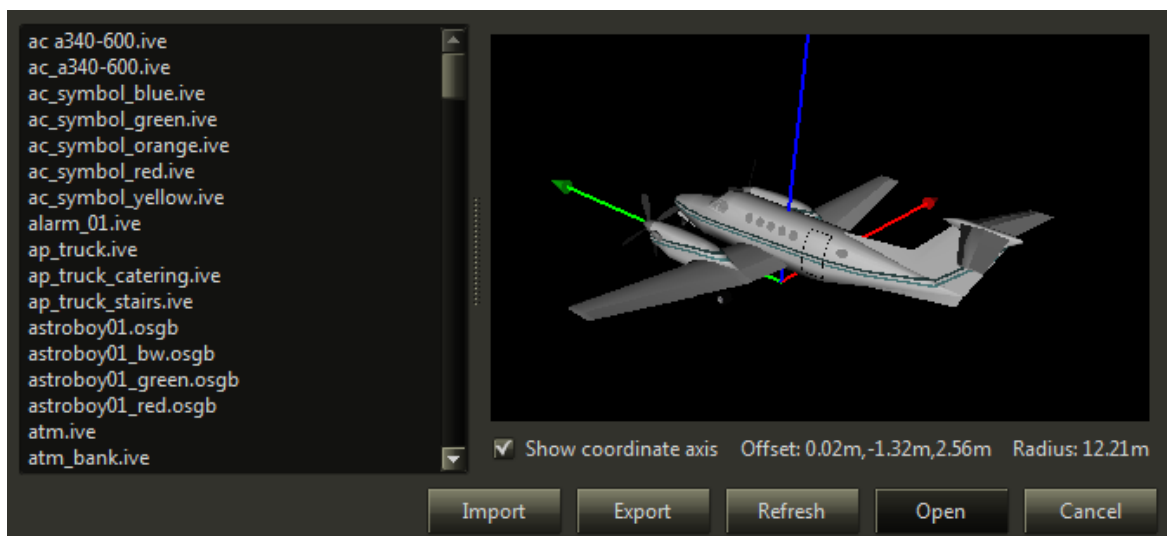
This dialog box will pop up when the user assigns resource files to a property of a device. These resource files can be video clips, icons, 3D symbols and others. If possible, depending on the resource file type, a preview is visible at the right side.

Above is an example for an *3D Symbol* file selection via the resource file dialog. The **Show coordinate axis** check box allows to show or hide the coordinate axis at the center of origin (x-axis in red, y-axis in green and z-axis in blue). The **Offset** label shows the offset of the *3D Symbol* file to the origin of the coordinate axis. The **Radius** label shows the rough size of the *3D Symbol* file.

One click at a file will select this for further steps, double click at a file selects it and closes the window.

Import	An explorer window opens to select a file. This file will copied to the suitable position.
Export	An explorer window opens. The selected file from the list will copied to the suitable directory in the explorer.
Refresh	Refresh the file list.
Open	Use the selected file and close the dialog.
Cancel	Close the dialog without changes.

4 Configuration

The configuration is separated in several different property areas:

- Common Properties
- Device Properties
- GIS Properties
- User Properties
- Third Party Settings

Note: At many places you can see the default values for properties. These properties have units at multiple times, for example meter for length specifications. By choosing an other unit in Program Settings - Units, these default values will re-calculated. For example, 5.00m will be converted to 196,85in (at a precision of 2)

4.1 Common Properties

These properties are basic parts of every object.

4.1.1 General Device Settings

These properties used in almost every device.

Name	Kind	Default Value	Comment
Id	Number	Next free value	Unique identifier for the object. Automatically created by the system.
Name	Text	New <object>	Name of the object.
Number	Number	[Empty]	Identifies the device with an user-defined character string
Initially enabled	Checkbox	Selected	Represents the initial enabled state of the device. Enables/disables the device. Note: This property can also be set from the device tree context menu of a single device
Category	Drop Down List	None	The category of the device.
Avatar	Radio Buttons and Drop Down List	Default	Default representation of the device in the 3D View. Note: Depending on device type there is a default avatar. If such avatar exists, it can be selected by a simple radio button. By selecting the custom radio option, a specific avatar can be selected.

4.1.2   Actions

If a device supports *Actions*, the to be associated actions can be selected on this page. The list showing all configured [actions](#) can be filtered by a simple text filter on top of the page. To associate an action, simply check the checkbox in front of the actions name.
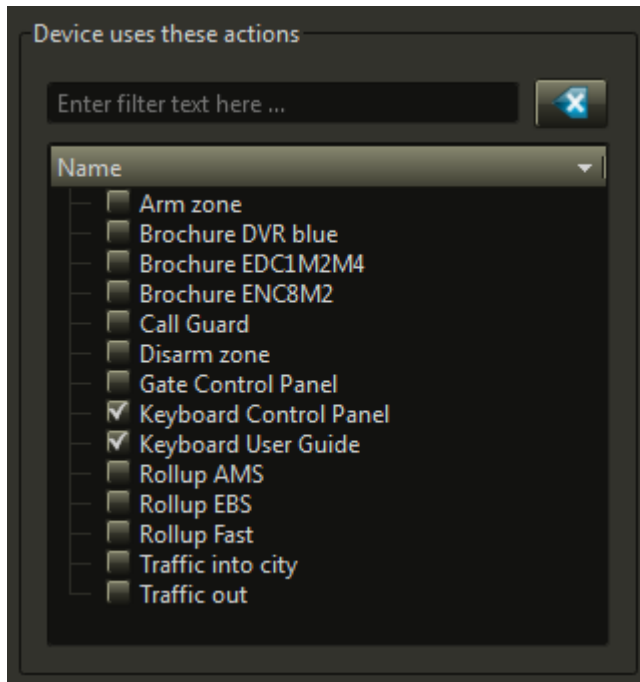
Additional to these actions some devices have default actions which also appears at the context menu of the Viewer.

Contextual Menu

Edit
Objec Opens the selected object for setting it up
t

Example
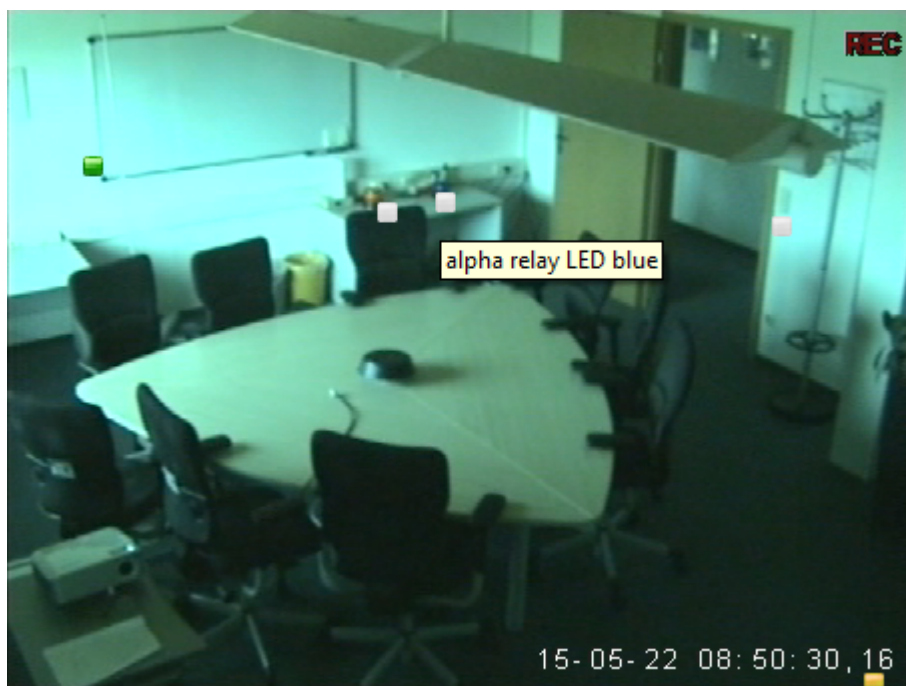
In this video screenshot you see the *alpha relay LED blue*. If you make a right-click at it you will see this context menu:
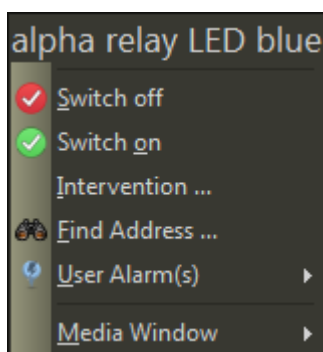
The two top entries are the device dependent actions, the last four are the standard entries for video windows.

If you additional assign the action *Call Guard,* the context menu in the Viewer changes to
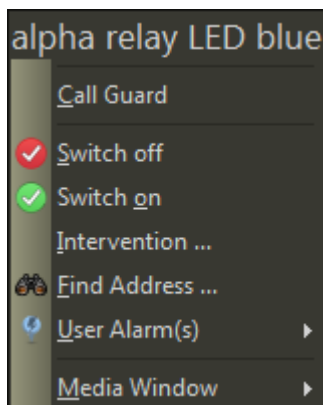
Hint!	*To rename the default Actions in the context menu, create a new Action with the same name, set at Device command the Device type of the device and at Command the default action to overwrite, then you can set the Name, UI Text and Icon you want.*

4.1.3   Categories

For managing device groups, devices can be grouped into categories. The list contains every category configured in the system.

To add a device into a category, select the category on the left side (multi-selection is supported) and press the 'Move right' [>>] button. To remove a device from a category, select it on the right side and press the 'Move left' [<<] button.
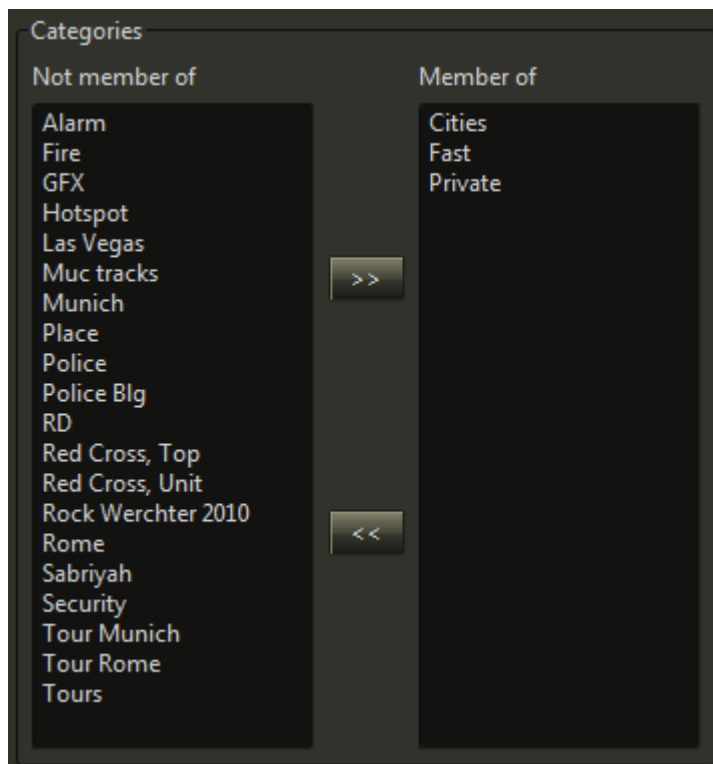
Categories example

Contextual Menu

Edit
Objec Opens the selected object for setting it up
t

4.1.4   Events

If a device has events, a specific event can be associated to any event handler configured in the system. In order to have easy access to a selected event handler a 🔲 **'Goto'** button is placed beneath which acts as a link to the selected event handler. Also a **'Test'** button can be found here to fire a test event for the selected event handler. This makes it easy to test the event configuration.
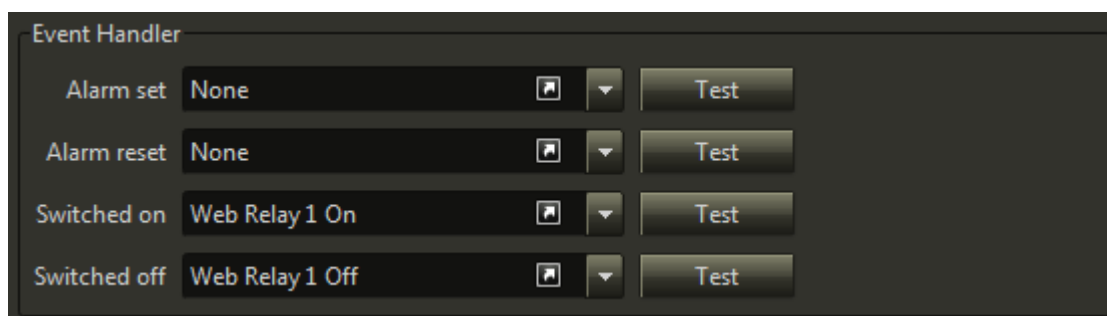
Event handler example (IO Device)

4.2 Device Properties

In TERRA 4D also virtual objects like *Actions* or *Event Handler* are devices. Devices have a specific subset of the Common Properties, a list of static properties (which are described in this topic) and a list of dynamic properties, depending on the device type.

4.2.1 Actions

In this section *Actions* will be configured. These *Actions* can be assigned to devices under the device settings at the **Actions** tab of the device. An *Action* is accessible over the context menu of the device in the Viewer application (device tree, GIS view) and also in the device tree of the Configurator. Additional to these *Actions* some devices may have default actions defined.

Name	Kind	Default Value	Comment
UI text	Text	[Empty]	Text will be shown in context menu.
Icon	File name	[Empty]	Insert the name or select a file with the Resource File Dialog
Type	Drop down list	None	*None* - Default value *Document link* - Opens selected document *External* - Start the program in **Command Line** *Event Handler* - Call Event Handler and start the workflow *Client Script* - Start the script at the client computer.**.** *Server Script* - Start the script at the server. *Device Command* - Send the command to the device.
Order number	Number	0	Set this number for ordering the actions inside the Viewer application context menus and action dock window. *Note*: Changes will take effect after restarting the <%VIEWER% application.

Name	Kind	Default Value	Comment
Live only	Checkbox	Unselected	Set it for actions useless at playback mode
Viewer action	Checkbox	Unselected	If set, the action will show up inside the Viewer application actions dock window. *Note*: Changes will take effect after restarting the <%VIEWER% application.
Shortcut	Text	[Empty]	Define a shortcut to trigger this action if it is defined as a viewer action
Description	Text	[Empty]	Describes the action.

4.2.2 Alarm Devices

An alarm device is similar to a tracking device, but only generates alarms when requested.

Name	Kind	Default Value	Comment
Connection string	Text	[Empty]	Depend on the selected device type. If device type *File* is selected the connection string is used as full path to a alarm file.
Type	Drop down list	Invalid	Type of the alarm device. Available types: • File

4.2.2.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.2.3 Cameras

The system differs between fixed and Pan/Tilt/Zoom (PTZ) cameras. In essence the configuration of most properties are the same regarding to the looks of the device inside the GIS view and the video image shown.

In order to make use of full 3D capabilities, the camera has to be positioned and calibrated properly.

A newly created camera will get the last position entered into the position widget.

Note: The orientation of cameras is to be set with **Calibration** - *View calibration results - Use manual settings*.

4.2.3.1 Fixed Cameras

A *Fixed Camera* is any camera that has no variable zooming or moving capabilities.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Select the camera type
Optics	Drop down list	Generic 4:3	Concatenate the camera with an optic, which is defined at Camera Optics
Near clipping distance	Number	1m	All position oriented calculations will be ignored up to this clipping distance
Description	Text	[Empty]	Describes the camera.

4.2.3.1.1 Calibration

Calibration View

The *Calibration* of a fixed camera involves the real camera image and the 3D View image of the area the camera overviews. To get a better understanding on where to set certain calibration points, two views are used. The direct and any alternative view. The direct view shows an image of the 3D GIS model from where the camera is positioned directly into the direction where the camera is pointed to. Additionally the camera opening angle (field of view) is used to get a natural 3D GIS model imagery.

As the camera is not calibrated in the first place, the direct view is is of no use unless the orientation of the camera is roughly correct. To overcome this problem, an alternative view can be configured and is used mostly for the initial calibration of the camera.

To calibrate a camera, *Calibration Items* are used. A *Calibration Item* is a line between the left side - the 3D View - and the right side - the video image - of the calibration tool. Ideally the line end points are identically positioned on the left and on the right side by grabbing the handle at the end points of the line. To help positioning the line end points it is possible to zoom into the views by using the mouse wheel. Search a distinctive feature in both sides and position the handles as good as possible over that feature.

The number of required calibration items is depending on the camera view, the distortion of the optic and if the calibration should optimize the field of view and/or the roll angle of the camera. Mostly three to four items should be sufficient, but for optimizing the field of view or the camera roll there should be at least four to five items.

Direct Camera View
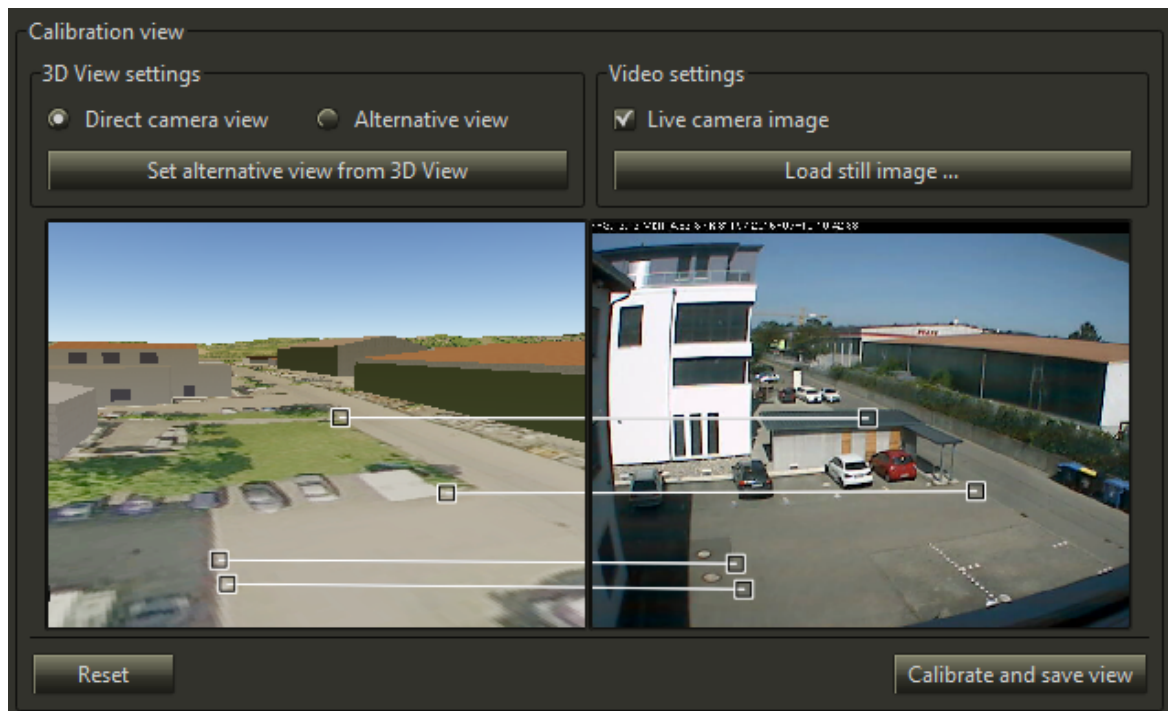
Calibration example - Direct View

Ideally the calibration item lines should be 100% parallel.

Alternative View
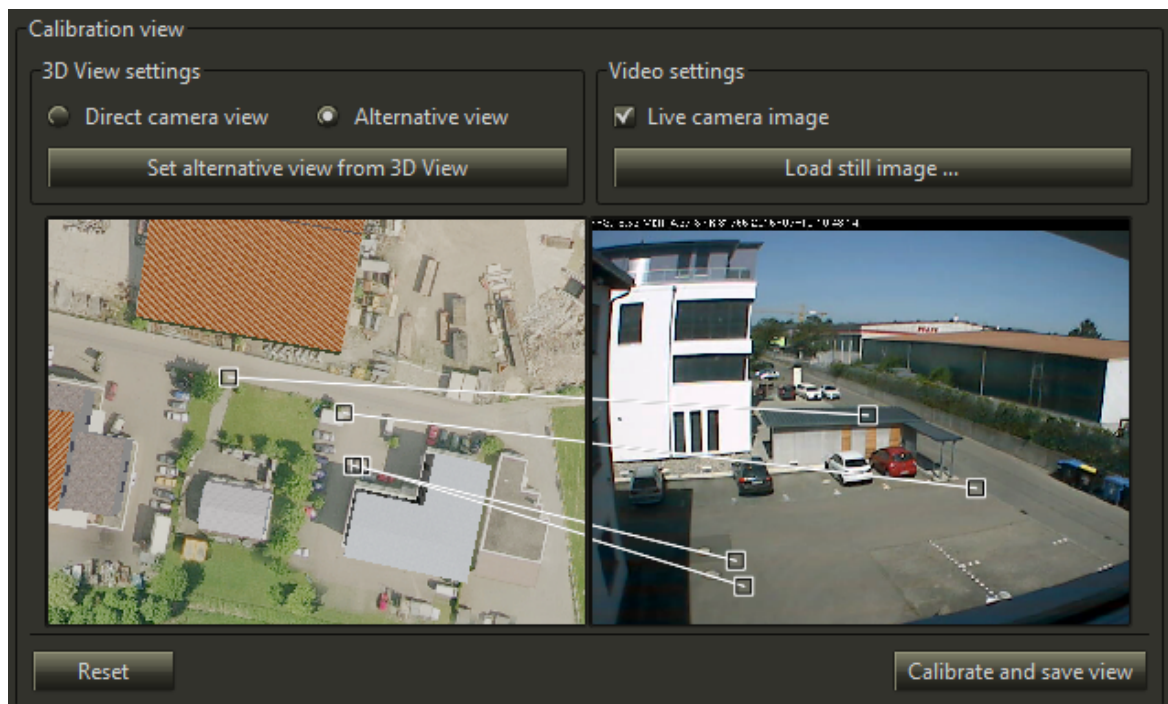
Calibration example - Alternative View

3D image is set easily with the help of an alternative view from the 3D View. Just move the 3D View to the desired area and click the '*Set alternative view from 3D View'* button.
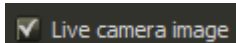
☑ Live camera image

The camera image will be live if the camera is not calibrated yet. If a calibration exists, the existing, saved, image will be shown. If a new image is needed, just check the *Live camera image* checkbox in order to get a live video stream. It can be helpful to un-check this box to stop the live stream, especially on cameras with high traffic, to get a clear view to distinctive features in order to set the calibration items.

Load still image ...
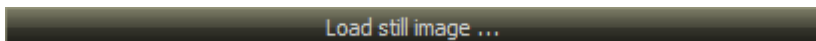
If an older image is desired to be used, press this button to import any image for the calibration to be based on.

⦾ Direct camera view   ⦿ Alternative view

Switch between direct and alternative view to determine the correct location of the matching points.

Context Menu On Either Side Of The Calibration View

Add Calibration Item
Delete Calibration Item
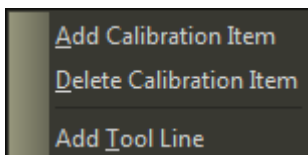
Add Tool Line

'Add Calibration Items' by using the context menu on either side of the calibration tool.

Remove a calibration item by using the context menu on the item to delete.

'Add Tool Line' as helper line between 3D image and real image for checking several points in the calibration tool.

Start Calibration

Calibrate and save view
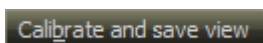
After adding the calibration items click the *'Calibrate and save view'* button to calibrate the camera. This will also save the view for later reference.

<u>Note</u>: The button will look different if there are no calibration lines available:

Save view only
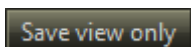
This button will only save the view for later reference.

Advanced Settings

To alter the camera calibration calculation, some parameters can be changed:

Name	Kind	Default Value	Comment
Position change radius	Number	0.0 m	The calibration algorithm can, to a certain degree, try to reposition the camera for better matching the calibration item points. If the initial

Name	Kind	Default Value	Comment
			positioning was not based on exact numbers, set this value to the amount of error you recon to be sufficient for the algorithm to try for better results.
Optimize Roll	Checkbox	Unselected	Normally the roll angle will not be optimized, as the camera should be mounted without such angle. To optimize the roll angle never the less, enable the optimization here.
Use field of view Y from optic	Checkbox	Unselected	If an optic with known field of view Y is mounted to the camera and it is configured properly, the value of that optic can be used directly.
Optimize Field of view Y	Checkbox	Selected	Un-select this if you do not want the field of view Y to be optimized. Automatically disabled if FovY of optic is used.

Note: These settings will not be saved within the devices properties or inside the devices calibration.

Delete Calibration
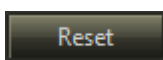
Reset

The calibration of a camera can be reset (deleted) by using the 'Reset' button.

View Calibration Results

In this section of the page the results of the camera calibration can be seen:

Name	Kind	Default Value	Comment
Vertical field of view	Number	47.25°	The cameras vertical opening angle
Orientation: Pan	Floating-point number	0.0°	The panoramic angle of the camera view
Orientation: Tilt	Floating-point number	0.0°	The tilting angle of the camera view
Orientation: Roll	Floating-point number	0.0°	The rolled angle of the camera view

The automatically calculated values in this section can be overridden with manual settings after enabling the controls by checking the *'Use manual settings'* checkbox.

Calibration Test Results

For testing the results, do some measurements for height and length in real world and compare them to the virtual measurements on video images showing the known measurements. Please keep in mind that the view should be clear and the viewing angle should be as straight as possible to get the best results.
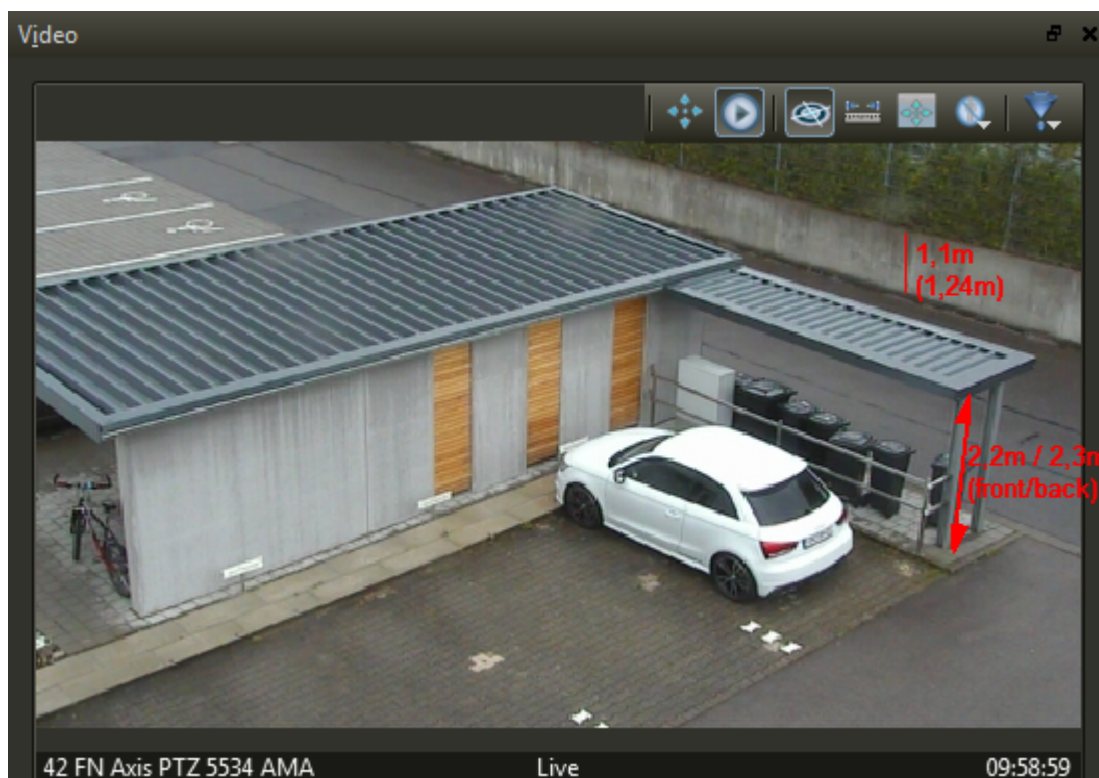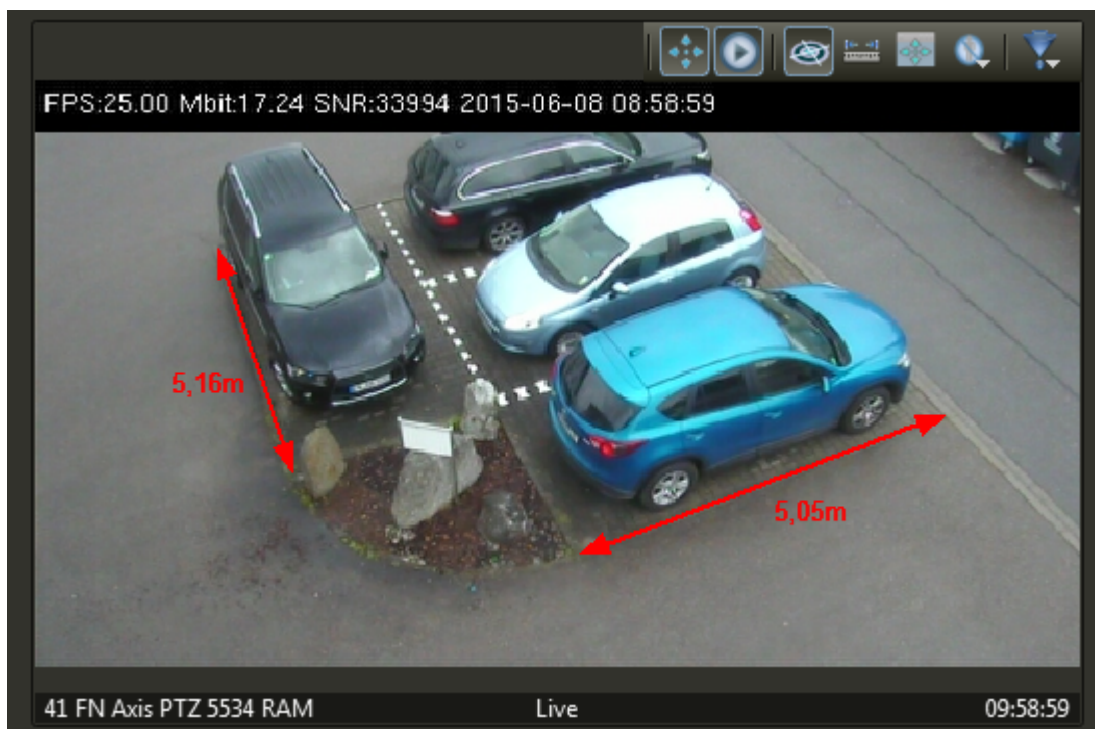
Examples for measurements

4.2.3.2 PTZ Cameras

A PTZ (Pan/Tilt/Zoom) camera is any camera that has variable zooming and / or moving capabilities.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Select the camera type
Control port	Drop down list	None	Port of the camera for commands and control
RS485 Id	Number	0	Control port RS485 protocol id number
Optics	Drop down list	Generic 4:3	Concatenate the camera with an optic, which is defined at [Camera Optics](#)
Near clipping distance	Number	1m	All position oriented calculations will be ignored up to this clipping distance
Auto track objects	Checkbox	Unselected	If set, camera follows axiomatically objects when they reach its coverage area
Description	Text	[Empty]	Describes the camera.

4.2.3.2.1 PTZ Calibration Views

In order to fully calibrate a PTZ camera, a number of different views have to be calibrated. The views should differ in orientation and zoom values. This is needed to determine the exact camera viewing area and default orientation.

PTZ View

Name	Kind	Default Value	Comment
View	Drop-down list	<First calibration view>	List contains all available calibration views of this PTZ camera
+ [Add]	Button		Adds a new calibration view and selects it for editing
- [Remove]	Button		Removes currently selected calibration view
Name	Text	New calibration [<number>]	Edits name of currently selected calibration view
Reset	Button		Deletes all existing calibration views in order to reset the camera calibration

Calibration View

Additional to the calibration view of the fixed camera, PTZ camera movement controls are available to alter the camera view.

Advanced Settings

Name	Kind	Default Value	Comment
Position change radius	Number	0.0 m	The calibration algorithm can, to a certain degree, try to reposition the camera for better matching the calibration item points. If the initial positioning was not based on exact numbers, set this value to the amount of error you recon to be sufficient for the algorithm to try for better results.
Optimize Roll	Checkbox	Unselected	Normally the roll angle will not be optimized, as the camera should be mounted without such angle. To optimize the roll angle never the less, enable the optimization here.
Use field of view Y from optic	Checkbox	Unselected	If an optic with known field of view Y is mounted to the camera and it is configured properly, the value of that optic can be used directly.
Optimize Field of view Y	Checkbox	Selected	Unselect this if you do not want the field of view Y to be optimized. Automatically disabled if FovY of optic is used.

View calibration results

In this section of the page the results of the camera calibration can be seen:

Name	Kind	Default Value	Comment
Vertical field of view	Number	47.25°	The cameras vertical opening angle
Orientation: Pan	Floating-point number	0.0°	The panoramic angle of the camera view
Orientation: Tilt	Floating-point number	0.0°	The tilting angle of the camera view
Orientation: Roll	Floating-point number	0.0°	The rolled angle of the camera view

The automatically calculated values in this section can be overridden with manual settings after enabling the controls by checking the '*Use manual settings'* checkbox.

4.2.3.2.2 Calibration

To fully calibrate the PTZ camera all calibrated single views need to be summarized. This is done by enabling/disabling wanted or unwanted calibration views. After selecting the wanted views, just press the '*Calibrate PTZ'* button. This produces the default orientation of the PTZ camera.

PTZ Calibration Views

A list of all available calibration views with this parameters:

Name	Kind	Default Value	Comment
Used in Pan calibration	Checkbox	Unselected	If checked, the view will be included into the Pan calibration of the camera
Used in Tilt calibration	Checkbox	Unselected	If checked, the view will be included into the Tilt calibration of the camera
Name	Text	[Empty]	The name of the calibration view. *Can not be edited.*
Default Pan	Floating-point number	[Empty]	The default panoramic angle of the calibration view in [degree]. *Can not be edited.*
Default Tilt	Floating-point number	[Empty]	The default tilting angle of the calibration view in [degree]. *Can not be edited.*
Default Roll	Floating-point number	[Empty]	The default rolling angle of the calibration view in [degree]. *Can not be edited.*
Overall Tilt	Floating-point number	[Empty]	The overall tilting angle considering even the rolling angle of the calibration view in [degree]. *Can not be edited.*

PTZ Calibration

Name	Kind	Default Value	Comment
Optimize Tilt/Roll	Checkbox	Unselected	Normally a PTZ camera should be mounted without tilt or roll angle. If there is such a tilted and/or rolled camera, use this property to calculate the appropriate angles automatically.
Default orientation: Pan	Floating-point number	0.0°	The panoramic angle of the default PTZ camera view
Default orientation: Tilt	Floating-point number	0.0°	The tilting angle of the default PTZ camera view
Default orientation: Roll	Floating-point number	0.0°	The rolled angle of the default PTZ camera view

The automatically created values in this section can be overridden by manual settings. Edited values will have immediate effects on the camera.

4.2.3.3   Visualisation

For visualizing a device inside the GIS view and adding additional information in camera views, several properties can be edited.

Name	Kind	Default Value	Comment
Statusbar: visible	Checkbox	Selected	Enables/disables the statusbar at the bottom of the camera picture
Statusbar: Text color	Color Field	White	With double click, the **Select Color** window opens.
Statusbar: Background color	Color Field	Black	With double click, the **Select Color** window opens.
Use custom videowall settings	Checkbox	Unselected	If unselected the videowall settings are taken from the camera avatar, if selected the local settings are used.
Videowall: enabled	Checkbox	Selected	Enables/disables the videowall shown in GIS view at the camera
Videowall: Distance	Floating-point number	5.00 m	Defines the distance of the videowall from the camera
Videowall: Elevation	Floating-point number	0.00 m	Defines the height difference from the axes of the camera view
Videowall: Size	Floating-point number	2,00 m	Defines how big the wall is displayed
Videowall: as billboard	Checkbox	Unselected	If yes, the videowall is oriented to you to show always the video. If no, the videowall is only be visible from the line of sight of the camera.
Use custom frustum settings	Checkbox	Unselected	If unselected the frustum settings are taken from the camera avatar, if selected the local settings are used.
Frustrum: enabled	Checkbox	Selected	Enables/Disables the representation of the camera covered area in the GIS view
Frustum: Distance	Floating-point number	5.00 m	How long, starting from the camera position, the frustum is drawn
Frustum: Color	Color Field	Blue	With double click, the **Select Color** window opens.
Tooltip: Show distance/heading	Checkbox	Unselected	Enables/Disables additional information inside tooltip about distance and heading of the mouse position inside the camera view

PTZ Only:

Name	Kind	Default Value	Comment
PTZ Presets: Preset	Drop down list	None	Selects a defined preset for editing
PTZ Presets: Add [+]	Button		Adds a new preset and selects it for editing
PTZ Presets: Delete [-]	Button		Deletes selected preset
PTZ Presets: Set To Preview	Button		Applies current preset data to preview
PTZ Presets: Get From Preview	Button		Applies current preview data to preset
PTZ Presets: Name	Text Field	New preset [<Number of preset>]	Name of the current preset
PTZ Presets: Number	Text Field	[Empty]	Identifies the preset with an user-defined character string
PTZ Presets: Pan	Number	Value of camera at preset creation time [degree]	
PTZ Presets: Tilt	Number	Value of camera at preset creation time [degree]	
PTZ Presets: Zoom	Number	Value of camera at preset creation time [percent]	

Camera View Area

In order for the system to know exactly which area a camera overlooks, the *'Camera View Area'* can be defined. This area is used by the system e.g. to detect which camera is able to 'see' an object.
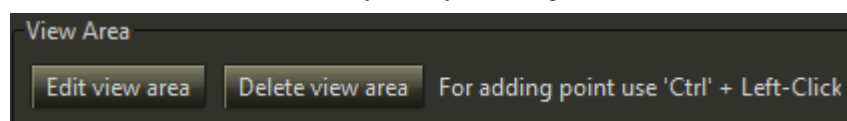
By clicking *'Edit view area'* the cameras view area can be edited inside the GIS view. To remove an existing area, press *'Delete view area'*

Example of a camera view area

4.2.3.4 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic [Actions](#).

4.2.3.5 Categories

Define one or more categories for this device.

For further information, see the common topic [Categories](#).

4.2.3.6 Events

Add events to this device. This includes the common events described in [Events](#).

Device specific events

Name	Comment
Video signal lost	No more video signal.
Video signal found	Video signal recovered.

4.2.4 Camera Optics

The camera optic is the complete way of light from the first lens entry to the camera sensor. As no optic is perfect, the distortion created by the 'imperfect' optics should be known by the system in order to calculate the correct positions from a camera image. As most cameras are available with

different optics, but in a project typically only a few different optics are used, these optics can be configured separately from the cameras and can therefore be reused.

A few basic parameters like aspect ratio and sensor size should be set before the distortion can be performed.

4.2.4.1 Fixed Camera Optics

A fixed camera optic is an optic without zooming capabilities. Therefore only one distortion calibration is needed.

Name	Kind	Default Value	Comment
Aspect Ratio	2 floating-point numbers, separated by colon	4.00 : 3.00	Describes the ratio of height and width of the camera sensor
Sensor size	Floating-point number	0.142 in	Describes the size of the sensor, important to calculate the right angle of the camera view.
Vertical field of view (FOV)	Floating-point number	47.26°	The optics vertical opening angle
Focal length	Text	[not editable]	The focal length of the vertical field of view in [mm]. This is for information only.

4.2.4.1.1 Distortion

To correct a distorted image, a straight edge has to be marked with at least one *Distortion Line*. Usually a maximum of three lines should be enough to correct any normal optic.

Distortion

In order to draw the lines, first select a test image from a camera showing at least one straight edge. In the drop down list, all cameras already using the optic will be listed on top of the list.

Last Stored Image

FN Axis 211 fixed

Astana outside

FF Akron South 02
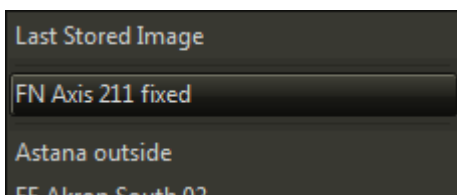
Press the [Add Distortion Line] context menu entry to add a distortion line. Then drag the five line handles evenly spread onto the straight edge.

To remove an unwanted line, simply select [Delete Distortion Line] from the context menu of any distortion line handle to remove.

After pressing the [Calibrate] button, the calibration will be calculated, the original test image will be stored and will be selected automatically for further reference if needed.

Distorted image
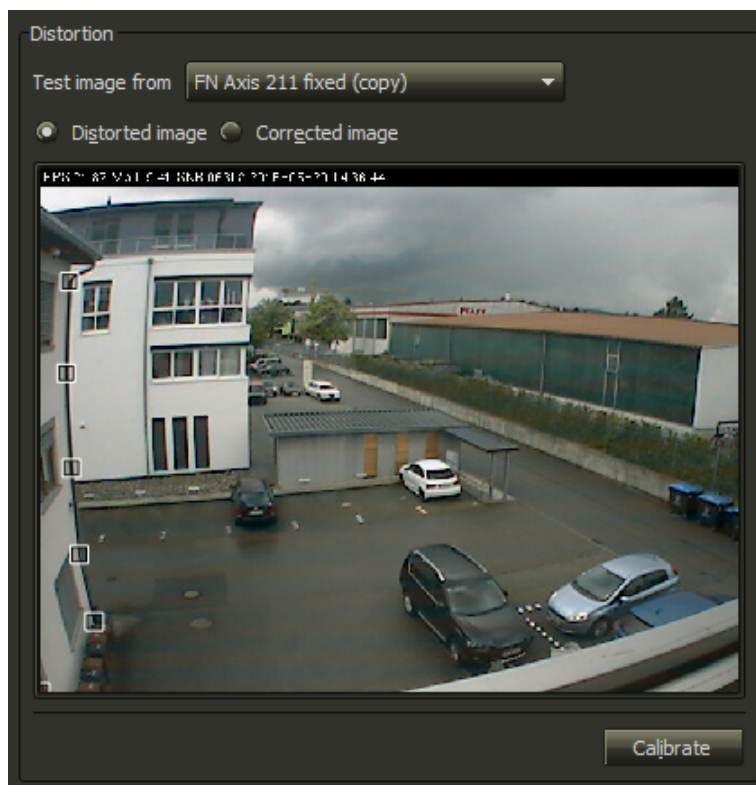
Corrected Image
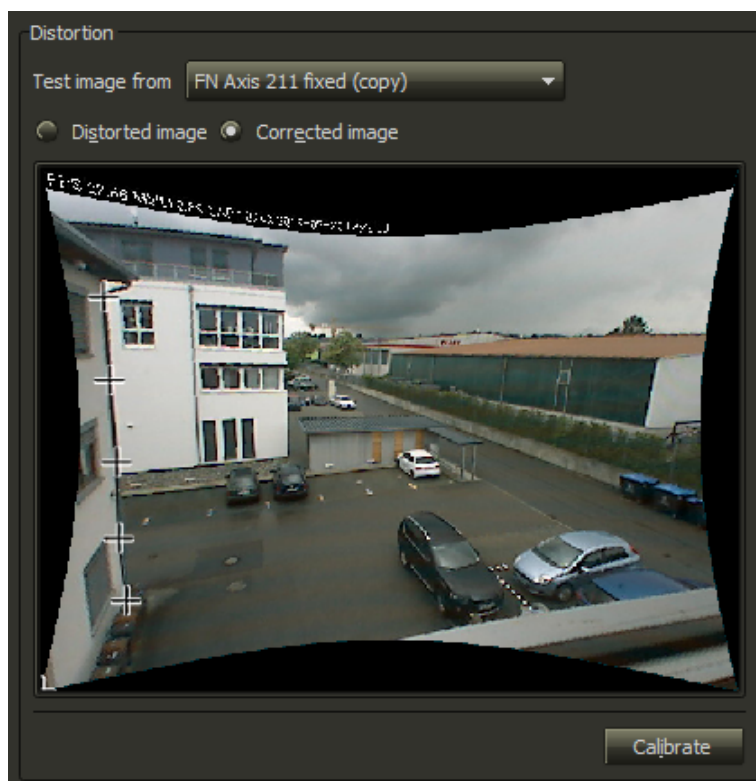
Ideally the corrected line should be perfectly straight.

Results

Name	Kind	Default Value	Comment
Radial 1	Floating-point number	0.0	First radial distortion coefficient
Radial 2	Floating-point number	0.0	Second radial distortion coefficient, use only for strong distorted lenses
Radial 3	Floating-point number	0.0	Third radial distortion coefficient, use only for very strong distorted lenses, like fish-eye
Shift X	Floating-point number	0.0	Horizontal shift of radial distortion center in pixels
Shift Y	Floating-point number	0.0	Vertical shift of radial distortion center in pixels

The results can be altered manually to enhance the calibrated distortion.

Advanced Settings

Name	Kind	Default Value	Comment
Optimize 'Radial 2'	Checkbox	Unselected	Enable this checkbox to further enhance the distortion calibration by optimizing the 'Radial 2' parameter
Optimize 'Radial 3'	Checkbox	Unselected	Enable this checkbox to further enhance the distortion calibration by optimizing the 'Radial 3' parameter

4.2.4.2 PTZ Camera Optics

A PTZ camera optic is an optic with zooming capabilities. Therefore only one distortion calibration is not sufficient as the optical lenses typically change their distortion over the focal length change. There is no exact number for telling how much different views are needed. If some positioning problems with zooming cameras are encountered, just add some views with the zoom factor where the problems appear.

Name	Kind	Default Value	Comment
Aspect Ratio	2 floating-point numbers, separated by colon	4.00 : 3.00	Describes the ratio of height and width of the camera sensor
Sensor size	Floating-point number	0.142 in	Describes the size of the sensor, important to calculate the right angle of the camera view.

4.2.4.2.1 PTZ Distortion View s

In order to create a sufficient number of calibration views for a PTZ camera optic, the zoom value of the camera should be different over all calibration views.

PTZ View

Name	Kind	Default Value	Comment
View	Drop-down list	<First calibration view>	List contains all available distortion views of this PTZ optic
+ [Add]	Button		Adds a new distortion view and selects it for editing
- [Remove]	Button		Removes currently selected distortion view
Name	Text	New calibration [<number>]	Edits name of currently selected distortion view

Distortion, Results and Advanced Settings

The single distortion view for a PTZ optic is just like a distortion view of a fixed optic.

4.2.4.2.2 PTZ Zoom/FovY Correlation

In order to get a correct PTZ Zoom to Field of view Y (FovY) correlation, a table of all calibration views of all PTZ cameras using the specific PTZ optic is shown on top of this page.

To specify the calibration views used for the correlation, simply select a to be used view in the *'Used'* column of that table. All used views a drawn in green, all unused in red.

Used	Source	Zoom	Vertical FOV	Focal Length	Magnification ▼	Horizontal FOV	Diagonal FOV
☐	HVS NE Wall (7) / New Calibration [3]	0	39.53	5.3	0.89	51.2116991825186	55.6331032593933
☑	HVS NE Wall (7) / New Calibration [1]	0	35.48	6	1.01	45.8891195913093	49.9762174726093
☐	HVS NE Wall (7) / New Calibration [4]	0	34.7	6.1	1.02	45.2130496983035	49.2548415827864
☐	HVS NE Wall (7) / New Calibration [2]	4.72973	29.36	7.3	1.23	38.3701909306406	41.9195660449221
☑	Unknown	4.72973	27.67	7.7	1.29	36.5123591727778	39.9179691674473
☑	HVS NE Wall (7) / New Calibration [6]	6.75676	25.6	8.4	1.41	33.6486343292718	36.8248351797841
☐	NDIA camera roof 01 / New Calibra...	0	20	10.8	1.81	26.4692108002613	29.0324200054192
☐	NDIA camera elevator 01 / New Cal...	0	20	10.8	1.81	26.4692108002613	29.0324200054192
☑	HVS NE Wall (7) / New Calibration [5]	18.2432	18.78	11.5	1.93	24.909864002513	27.3335146062671
☑	HVS NE Wall (7) / New Calibration [7]	39.8649	9.58	22.7	3.81	12.7690245593779	14.0453547984776
☑	HVS NE Wall (7) / New Calibration [8]	62.1622	4.54	48.1	8.08	6.04558149175503	6.65437762571278

Zoom / FovY correlation example

The chart at the bottom of this page shows all views as a square mark. All used and unused marks are stitched together to get a curve of the correlation.

Select and deselect the views to add or remove zoom / FovY value pairs to get an as smooth as possible curve.

Table Columns

Name	Kind	Default Value	Comment
Used	Checkbox	un-checked	If checked, the view is added to the correlation curve
Source	Text	[not editable]	The camera and view from where the values will be used
Zoom	Text	[not editable]	The zoom value of in [%]

Name	Kind	Default Value	Comment
Vertical FOV	Text	[not editable]	The Vertical Field of View in [degree]
Focal Length	Text	[not editable]	The focal length in [mm]
Magnification	Text	[not editable]	The magnification in [x:1]
Horizontal FOV	Text	[not editable]	The Horizontal Field of View in [degree]
Diagonal FOV	Text	[not editable]	The Diagonal Field of View in [degree]

4.2.5 Camera Sensors

Camera sensors detect objects or possible objects in video images of the camera.

Name	Kind	Default Value	Comment
Type	Drop down list	None	Select the type of the camera sensor.
Camera	Drop down list	None	The camera on which the sensor detects.
Defaults: Object avatar	Radio Buttons and Drop Down List	Default	See Tracking Devices for further explanation.
Defaults: PTZ object tracking	Drop down list	No Tracking	Defines the default setting for object tracking with cameras with *'Enable object tracking'* switched on. The tracking mode can be overruled later on the object. *No Tracking* - objects are not tracked. *Normal Priority: Nearest Camera* - objects are tracked by the nearest camera *High Priority: Nearest Camera* - objects are tracked by the nearest camera, overrides tracking of any 'Normal Priority' object *High Priority: All Cameras* - all PTZ cameras that can view the object follow it.

4.2.5.1 Camera Sensor Filter

A text filter for filtering the output of a camera sensor device. Useful if a camera sensor device generates many objects with different types and/or names.

Name	Kind	Default Value	Comment
Id filter	Text Field	[Empty]	Filters tracking device generated object property '*Name*'
Type filter	Text Field	[Empty]	Filters tracking device generated object property '*Type*'
Default object avatar	Drop down list	None	If the tracking device generates objects, they will be shown with this avatar by default. Objects of special type or id can have specific avatars, defined in filters added to the device.
Default PTZ tracking mode	Drop down list	OFF	Determines if cameras with 'Auto track objects' enabled track objects from this tracker. The tracking mode can be changed later on the object. *OFF* - objects are not tracked. *Normal Priority: Nearest Camera* - objects are tracked from the nearest camera *High Priority: Nearest Camera* - objects are tracked from the nearest camera, overrides tracking of any 'Normal Priority' object *High Priority: All Cameras* - all PTZ cameras that can view the objects follow it.
Tracked camera	Drop down list	None	if selected, the tracking device controls the movement of the camera. This is used for moving cameras, e.g. in helicopters or airplanes.
Tracked camera orientation mode	Drop down list	Azimuth	Controls which Camera parameters are changed by the tracking device. Azimuth - only camera azimuth Azimuth and elevation - camera azimuth and elevation All - camera azimuth, elevation and roll None - no camera parameters Target - tracker object is a target for the camera, PTZ camera is turned in the direction if the target Invisible Target - same as target, but no avatar is shown on the target location

Name	Kind	Default Value	Comment
Tracked Camera Platform orientation mode	Drop down list	Azimuth	some tracking devices have a 'platform' object, e.g. the airplane with an PTZ camera on board. This mode determines how the platform object is controlled by the tracker device. Azimuth - only platform azimuth Azimuth and elevation - platform azimuth and elevation All - platform azimuth, elevation and roll None - no platform parameters Target -do not use Invisible Target - do not use

4.2.5.2 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.2.5.3 Events

Add events to this device. This includes the common events described in Events.

Device specific events

Name	Comment
Alarm	Alarm has been triggered.

4.2.6 Communication Devices

A communication device is special kind of Tracking Device that tracks communication.

Name	Kind	Default Value	Comment
Avatar	Drop down list	None	Representation of the communication device in the GIS view.
Type	Drop down list	Invalid	The type of the communication device
Inactivity timeout [ms]	Number	0 ms	See Tracking Devices

Default

Name	Kind	Default Value	Comment

Object Avatar	Radio Buttons and Drop Down List	Default	See Tracking Devices for further explanation.
Communication Display	Drop down list	None	Configure the connection line between two communicating avatars. See Communication Display Types
PTZ object tracking	Drop down list	No Tracking	Defines the default setting for object tracking with cameras with *'Enable object tracking'* switched on. The tracking mode can be overruled later on the object. *No Tracking* - objects are not tracked. *Normal Priority: Nearest Camera* - objects are tracked by the nearest camera *High Priority: Nearest Camera* - objects are tracked by the nearest camera, overrides tracking of any 'Normal Priority' object *High Priority: All Cameras* - all PTZ cameras that can view the object follow it.

Height Settings

Name	Kind	Default Value	Comment
Height mode	Drop down list	Absolute	See Tracking Devices

Tracked Camera

Name	Kind	Default Value	Comment
Camera	Drop down list	None	See Tracking Devices
Orientation mode	Drop down list	Azimuth	See Tracking Devices
Platform orientation mode	Drop down list	Azimuth	See Tracking Devices

4.2.6.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.2.6.2 Events

Add events to this device. This includes the common events described in Events.

Device specific events

Name	Comment
Alarm	Alarm has been triggered.

4.2.7 Control Ports

With Control Ports external devices are connect through serial ports or over the network.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Type of the control port
Control Type	Drop down list	Pan, Tilt, Zoom	The PTZ capabilities for the port: - Pan, Tilt, Zoom - Pan, Tilt - Pan - Zoom
Tilt min	Number	-90°	Minimum possible tilt angle
Tilt max	Number	0°	Maximum possible tilt angle
Pan min	Number	-180°	Minimum possible pan angle
Pan max	Number	180°	Maximum possible pan angle

Supported Types

Name	Kind	Comment
Serial port	RS-232	Connect PTZ cameras or ADS-B.
Remote serial	RS-232 / IP	Connect PTZ cameras or ADS-B on a remote computer.
AXIS	IP	Connect PTZ IP cameras using AXIS protocol.
ONVIF	IP	Connect PTZ IP cameras using ONVIF protocol.

4.2.8 Event Handlers

Name	Kind	Default Value	Comment
Default Priority	Number	5	Priority of the event.
Alarm avatar	Radio Buttons and Drop Down List	Default	Avatar for created alarms. See Tracking Devices for further explanation.

Name	Kind	Default Value	Comment
Serverscript	Drop down list	None	Script to be executed on the server machine when the event handler is triggered.
User trigger allowed	Checkbox	Unselected	If checked a user can trigger this event handler from the context menu in the Viewer otherwise the event handler can only be used for device events.
Generate alarm	Checkbox	Unselected	If enabled the event handler automatically generates an alarm.
Incident type	Drop down list	None	Select the incident type to be used with this event handler.
Auto-open incident workflow	Checkbox	Unselected	If this checkbox is enabled and when the event handler is triggered the selected workflow is automatically opened in the Viewer. Note: As the workflow is assigned to on or more user groups, the workflow will open only for the first logged on member of these groups.

A common use case for an event handler is to allow an operator to create an alarm when he detects an unusual or suspicious event (e.g. a person climbs through a window instead of using the door). In such a situation the operator can right-click in a video or 3D view and select the event handler from the context menu.
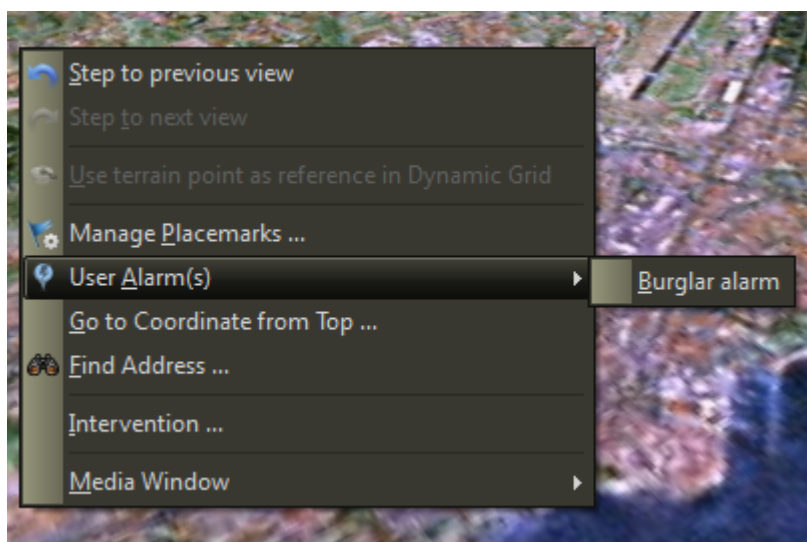
User Alarm(s) context menu in Viewer

For the event handler to appear in the context menu the checkbox *User trigger allowed* must be checked. The name of the event should be descriptive for the created alarm. To directly create an alarm the checkbox *Generate alarm* should be checked otherwise no alarm is generated and no visual feedback for the alarm is visible.

Note: The alarm does not show up in the 3D view if the event source does not provide an event position. This happens for example for events generated by a timer device.

Testing an event handler

In order to test an event handler it should be selected at a device <u>event</u> and can be executed as an test event from the corresponding <u>page</u>.

4.2.8.1 Member devices

The list contains all devices which can have event handlers and the devices which use this event handler are checked. This tree is for information only.
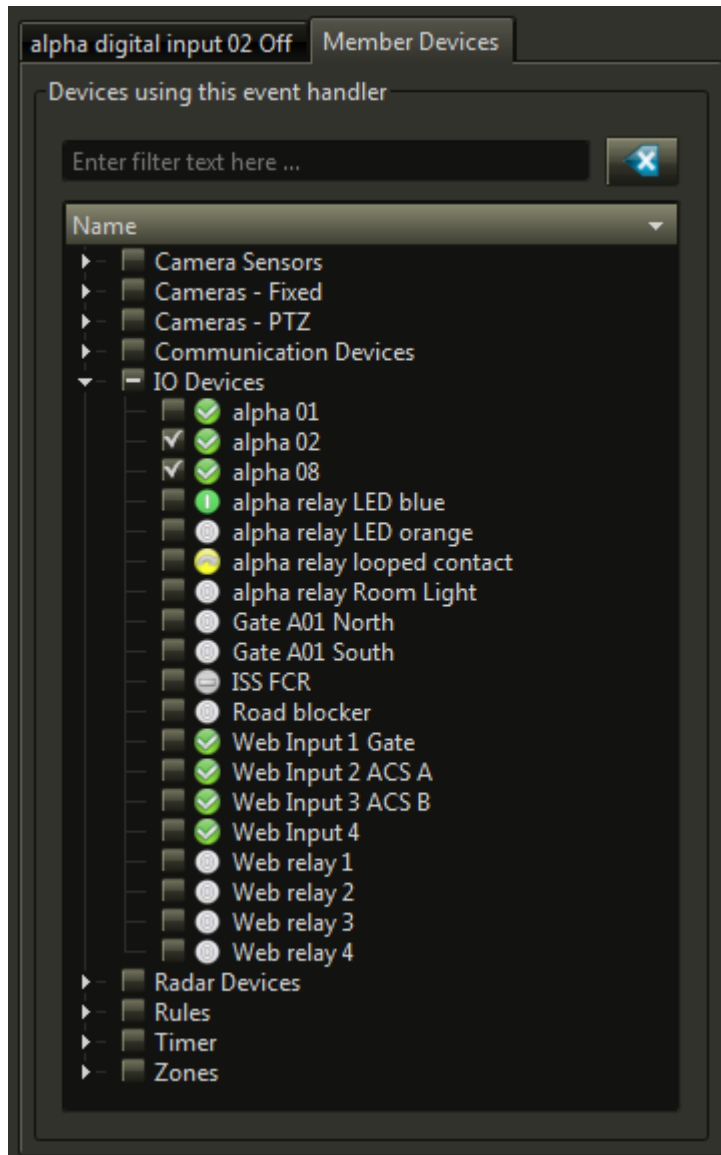
4.2.9 Incident Types

With the help of *Incident Types* it is possible to guide the operator through different incident scenarios. If configured, the operator has even the possibility to add values, positions with map images or video stills to the newly created incident.

There are three different types of *Incident Types*:

- **Simple Workflow**: A simple way to create a guideline with choices for the operator.

- **Facial Recognition**: In addition to the *Simple Workflow* it will add facial recognition controls to the workflow.

- **Interactive report**: The most flexible way to give the operator instructions for an incident. Requires an HTML based form for instructions.

Workflows are guidelines with the possibility to include choices for the operator to select and to start the necessary actions to solve the situation. An *incident* will be activated by an Event Handler where the *incident type* is configured in order to initiate a *workflow*.

A *workflow* can be interrupted by other *workflows* with higher priority; after ending the higher priority one, the previous one continues.

Workflows have the four tabs **General** (it has the same name as the *Incident Type* itself), Form Fields, **States** and **Graph**.

| Injured Person | Form Fields | States | Graph |
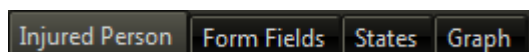
The general tab defines the properties used by the *Incident Type* start.

Name	Incident Injury
Type	Interactive report ▼
HTML directory	IncidentInjury ...
Layout	Incident report intervention ▼
Window orientation	○ Vertical ○ Horizontal
Client Script	Set alarm location - GIS - DynVideoList ▼
Server Script	None ▼
Default user groups	☑ admin ☑ default ☑ VoIP receiver ☑ Bronze ☑ Silver ☑ Gold
Icon	...
Page orientation	◉ Portrait ○ Landscape
Mail recipient(s)	john.f@fastprotect.net
Mail from	
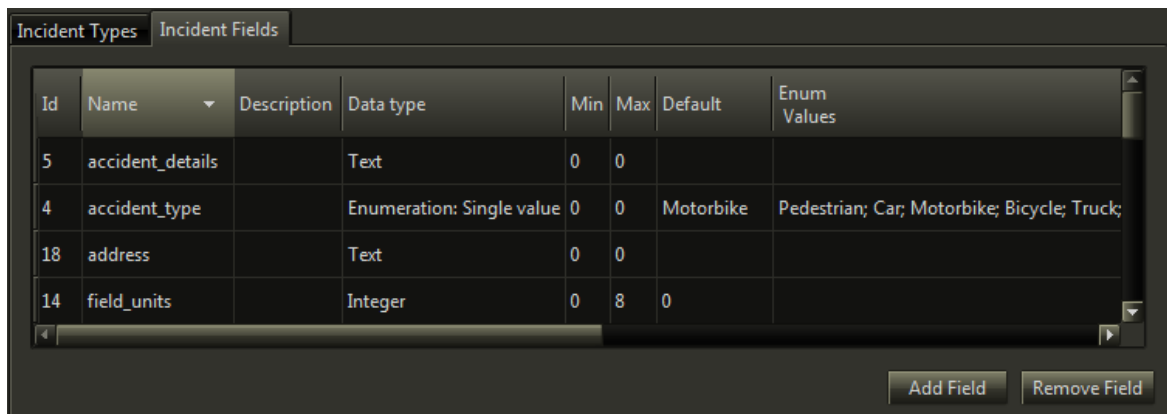
Incident Type: General tab

Name	Kind	Default Value	Comment
Type	Drop Down List	[Simple Workflow]	Select the type the incident requires.
HTML directory	Directory selector	[Empty]	The directory of the interactive HTML files. Located inside the systems *share/incident* directory *Note*: Only visible if type is *Interactive Report*
Layout	Drop Down List	None	If set, the *Incident* changes the layout of the Viewer to the specified layout. After finishing the previous layout will be restored.
Window orientation	Radio buttons	Vertical	Based on this orientation the UI elements are layed out for *Simple Workflow* and *Facial Recognition*.
Client Script	Drop Down List	None	Start the script at the client computer. Note: The script will be executed only once after an incident is opened for the first time.
Default User Group	List of Choice boxes	Selected	Define the user group(s) who should handle the *Incident*.
Icon	File	[Empty]	Select an icon file to be shown over the avatar.
Page orientation	Radio buttons	Portrait	Setup the page orientation when exporting PDFs
Mail recipient(s)	Text	[Empty]	Enter the recipients when sending by email
Mail from	Text	[Empty]	Enter the sender when sending by email. If empty then the default sender address will be used. See mail settings.

The files inside the HTML directory need to follow certain rules which are listed in a separate document.

4.2.9.1 Incident Fields

In order to use an input field in an incident report, *incident fields* have to be configured.

Id	Name	Description	Data type	Min	Max	Default	Enum Values
5	accident_details		Text	0	0		
4	accident_type		Enumeration: Single value	0	0	Motorbike	Pedestrian; Car; Motorbike; Bicycle; Truck;
18	address		Text	0	0		
14	field_units		Integer	0	8	0	

Incident Types | Incident Fields

Add Field | Remove Field

An *Incident Field* has these properties:

Name	Kind	Default Value	Comment
Description	Text	[Empty]	A short description of the fields use
Data type	Drop Down List	Invalid	The data type of the field: • **Boolean**: A checkbox will be shown to enter the value • **Integer**: A spin-box will be shown to enter the value • **Float**: A spin-box with to decimals will be shown to enter the value • **Text**: A text-edit field will be shown to enter the value • **Date/Time**: A date/time picker will be shown to enter the value • **Position**: A position field will be shown to enter the value • **Enumeration: Single value**: A combo box will be shown to pick the value • **Enumeration: Multiple values**: A list will be shown to check the value(s)
Min	Number	0	If the data type is a number like *integer* or *float*, this is the minimum value to be entered
Max	Number	0	If the data type is a number like *integer* or *float*, this is the maximum value to be entered
Default	Drop Down List	[Empty]	Depending on the data type, this default value will be used
Enum Values	Drop Down List	[Empty]	If the data type is an *enumeration*, these values will be used to fill the list or the combo box

Add Field   Add a new field

Remove Field   Remove the selected field

4.2.9.2 Form Fields

To add incident fields to a specific *incident type*, *from fields* are needed.

Add a form field and name it accordingly to the needs of the form, either in simple workflow or interactive form and add some description text to it. By default the form field will be named after the assigned incident type field.

Name	Kind	Default Value	Comment
Name	Text	Name of selected incident type field	Name for form field to identify it
Description	Text	[Empty]	For internal reverence only
Field	Drop Down List	[Empty]	List of all defined incident type fields

 Move the selected field down.

 Move the selected field up.

 Add a new field

 Remove the selected field

4.2.9.3 States

The *Workflow* itself will be defined in the *States* tab.

Every *Workflow* needs at least a Start and an End state. Between these both more states to handle the situation can be included. Every state is tied together with at least one following state, except the end state. They will be processed in the order you define, but return to previous states is also possible.
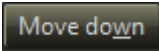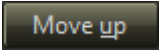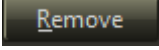
Note: Be careful to prevent endless loops, they will not be detected or stopped by the system.

In states, define the text shown to the operator and the links to other states, except of the end state. The links are defined with actions, giving the possibility to show text but also take decisions by the operator. To guarantee that critical states are handled in time, define a timeout for the current state and the default action to use if it is exceeded. At every action there is also the possibility to call a client and/or a server script to execute.

It is possible to define a state which changes the assigned user group, e.g. to escalate a problem if the default user group is not the right one to handle it. In this case the *Workflow* will disappear from the current operator and appears at an operator screen of the new user group. It is also possible to change the priority of a state, this affects the position of the *Workflow* in the list of the new user group.

Field values of this types incident fields can also be changed.

States buttons

Move down	Move the selected state down.
Move up	Move the selected state up.
Add	Add a new state, it will added at the end.
Remove	Remove the selected state.

State properties

Select a state by clicking at it and set the properties in the *Workflow State* below.

Name	Kind	Default Value	Comment
Name	Text	New *Workflow State*	Name of the state for referencing
State Finish	Drop Down List	Not Finished	A state can have different results: • Not Finished: The state should have at least one action to move on to another state • Finished: The state has no action and will be finished (closed) as a valid alarm • False Alarm: The state has no action and will be finished (closed) as an invalid (false) alarm
Linked to this state(s)	Read-only Text		Shows the linked state(s), defined at the **Actions** tab. If there is more than one state linked, they will be separated by semicolons.

The properties are split in several tabs, depending on the type of the *incident type*.

Form (if incident type is of type 'Simple workflow')

Name	Kind	Default Value	Comment
Title	Text	[Empty]	The title will be shown above the text in the Viewer
User Text Group	Checkbox	Unselected	If set, a the specified text will be shown to the operator
User Text	Text	[Empty]	Insert a helpfully text for the operator. At the starting state, this could be the explanation of the incoming event and a help for the possible decision to be done by the operator
Document Group	Checkbox	Unselected	If set, a the specified document, text or simple HTML, will be shown to the operator
Document	File name	[Empty]	Defines, if a document is linked to the state. This could be an operating guide

Fields

All fields defined are shown to select their properties for the current state.

Name	Kind	Default Value	Comment
Visible in state	Checkbox	Unselected	If set, the field is visible
Read only	Checkbox	Unselected	If set, the field is read only
Input required	Checkbox	Unselected	If set, the field input is required

Actions

All actions of a state are defined and ordered in the actions list.

Action buttons
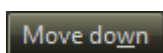
   Move the selected action down.
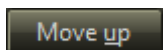
   Move the selected action up.
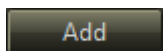
   Add a new action, it will added at the end.
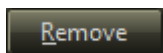
   Remove the selected action.

Action properties

The properties of an action will be set inside the **State Action** group. The properties which have to be set, like *Name* and *Next State* can be altered directly, the other ones can be edited by clicking the *'Edit Action Changes'* button to open a separate dialog.

Name	Kind	Default Value	Comment
Name	Text	New *Workflow* State Action	The name of the action
Next State	Drop Down List	None	Next state to call if this action is selected

Edit state action dialog

Name	Kind	Default Value	Comment
Change Priority Checkbox	Checkbox	Unselected	If checked the priority will change to the specified number
Change Priority	Number	1	Change the priority of the workflow if this action become active
Change Usergroups	List of choice boxes	Unselected	The user group of the *Workflow* changes and this *Workflow* appears at operators of this user group. If the current operator isn't part of it, it will disappear from his list
Change Field Values	List	Empty	Add or remove Field Value Changes with the help off the respective buttons. Select field to change and set the value.
Client Script	Drop Down List	None	Start the [script](#) at the client computer.
Server Script	Drop Down List	None	Start the [script](#) at the server.

State default action

Name	Kind	Default Value	Comment
Default action	Drop Down List	None	Which action to use after timeout
Timeout	Number	60 s	Time for the operator to select an action, if *Default Action* or Next *State* is set. To have no timeout, set to zero.

4.2.9.4 Graph

A graphical depiction of the states dependencies in the incident type (*Workflow*).

An example of a workflow
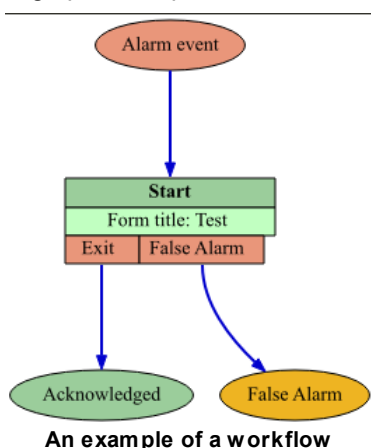
4.2.10 IO Devices

An IO device is an input and/or output hardware switch in the system. Configure what happens if the operator set a state to the device, e.g. switch light on, blink an alarm lamp and many more.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Select the type for the device. See For details about integrated subsystems see TERRA 4D document "Integrated Subsystems"
Alarm timeout	Number	0 s	The time after the alarm stops automatically.
Initial armed state	Checkbox	Selected	Armed state means, that the sensor event will be used, unarmed state, that they will be ignored. The property here defines the state at starting, in the Viewer, it is possible to change this with the context menu.
Description	Text	[Empty]	Describes the IO device.

4.2.10.1 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

Depending on the type, IO devices can have additional actions.

4.2.10.2 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.2.10.3 Events

Add events to this device. This includes the common events described in Events.

Device specific events

Name	Comment
Alarm set	Triggered if an alarm is set by the device.
Alarm reset	Triggered if an alarm is reset by the device.

4.2.11 Radar Devices

A radar device is special kind of Tracking Device and therefore shares some of its properties.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Select the type for the radar. See For details about integrated subsystems see TERRA 4D document "Integrated Subsystems"
Extrapolation interval	Number	0 ms	See Tracking Devices
Inactivity timeout	Number	0 ms	See Tracking Devices
Detection radius	Floating-point number	0.0 m	Radius around the radar device in which the radar detects objects.
Color	Color Field	None	With double click, the **Select Color** window opens.
Color alarmed	Color Field	None	With double click, the **Select Color** window opens.
Range sphere: Azimuth	Floating-point number	360.0°	Opening angle of the range sphere in horizontal direction.
Range sphere: Elevation	Floating-point number	10.0°	Opening angle of the range sphere in vertical direction.
Range sphere: Interval	Number	4000 ms	Time in for the radar animation to complete one full scan. If the interval is set to zero no animation is used.

Name	Kind	Default Value	Comment
Range sphere: Solid	Checkbox	Unselected	If not checked the range sphere uses a solid color at the center and full transparent color at the edge of the detection zone otherwise the same color for the entire range sphere is used.
Defaults: Object avatar	Radio Buttons and Drop Down List	Default	See [Tracking Devices](#) for further explanation.
Defaults: PTZ object tracking	Drop down list	No Tracking	Defines the default setting for object tracking with cameras with *'Enable object tracking'* switched on. The tracking mode can be overruled later on the object. *No Tracking* - objects are not tracked. *Normal Priority: Nearest Camera* - objects are tracked by the nearest camera *High Priority: Nearest Camera* - objects are tracked by the nearest camera, overrides tracking of any 'Normal Priority' object *High Priority: All Cameras* - all PTZ cameras that can view the object follow it.
Height settings: Heightmode	Drop down list	Absolute	See [Tracking Devices](#)
Tracked camera: Camera	Drop down list	None	See [Tracking Devices](#)
Tracked camera: Orientation mode	Drop down list	Azimuth	See [Tracking Devices](#)
Tracked camera: Platform orientation mode	Drop down list	Azimuth	See [Tracking Devices](#)

A radar device has a limited detection area, which is visualized in the software as range sphere. The range sphere properties do not have any influence in the operation/detection of radar itself. These properties are for visualization purposes only.

The state of the radar device can either be non-alarmed or alarmed. For the two different states different colors can be configured.

The radius of the range sphere is equal to the detection radius of the radar. The properties "Azimuth" and "Elevation" are used to determine the dimensions of the range sphere. E.g. a range sphere with azimuth of 360 degree (and 10 degree elevation):
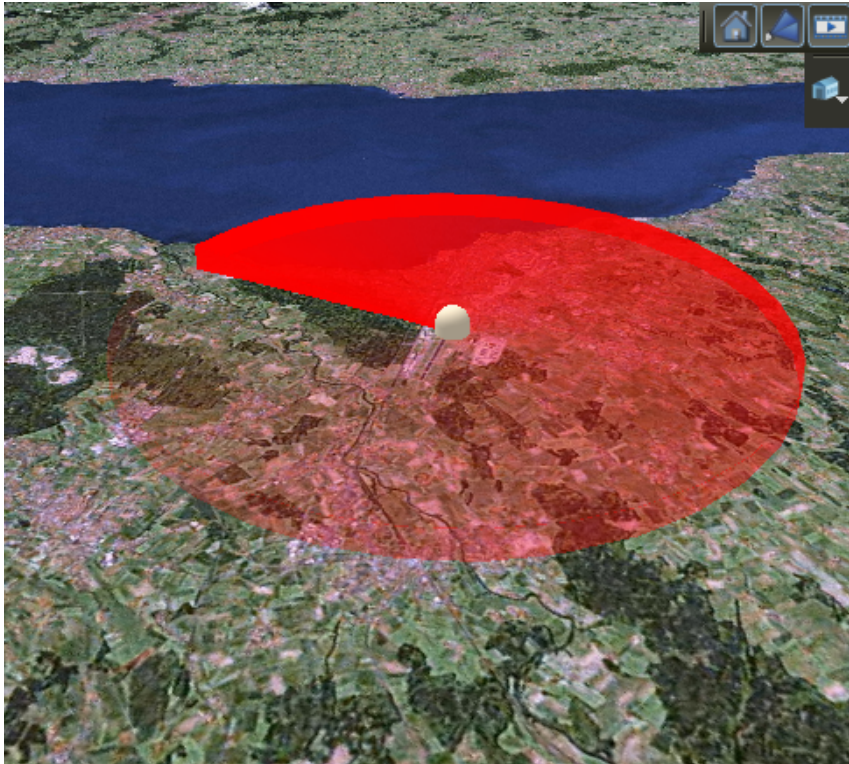
A range sphere with an azimuth of 90 degree:
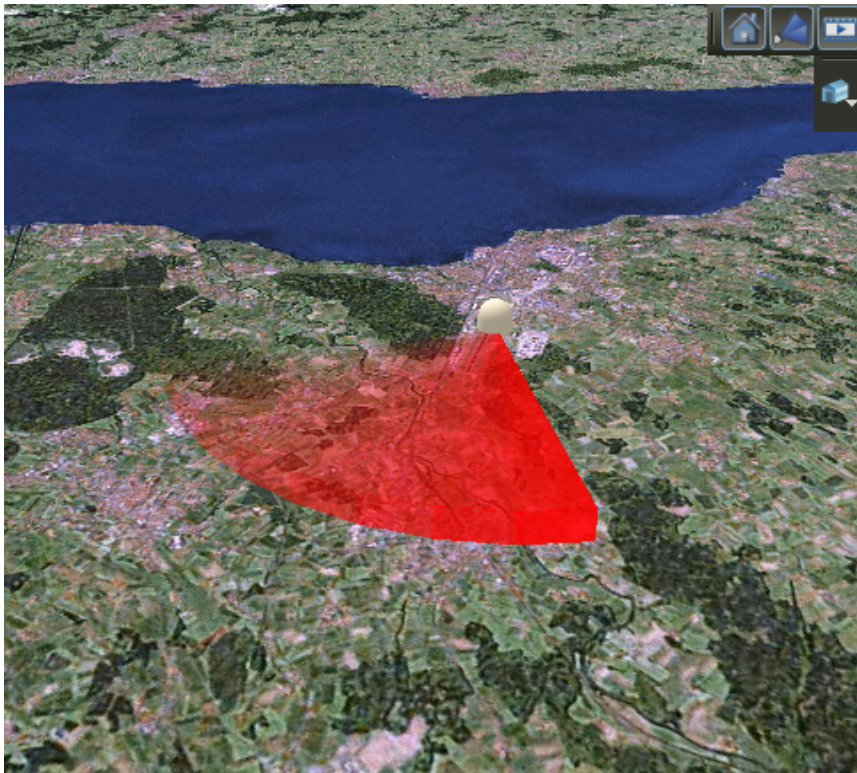
4.2.11.1 Radar Device Filter

A text filter for filtering the output of a radar device. Useful if a radar device generates many objects with different types and/or names.

See Tracking Device Filter for property details.

4.2.11.2 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.2.11.3 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

4.2.11.4 Events

Add events to this device. This includes the common events described in Events.

Device specific events

Name	Comment
Alarm	Alarm has been triggered.

4.2.12 Reports

Reports can be used to gather system information and send these information as HTML or PDF to other parties via email.

Name	Kind	Default Value	Comment
Template directory	Directory selector	[Empty]	The directory of the HTML files for generating the report. Located inside the systems *share/report_tpl* directory
Page orientation	Radio button group	Portrait	Which page format the generated report will have
Report interval	Drop down list	1 Day	Which duration the report will have
Generate PDF	Checkbox	Selected	If checked a PDF will be generated from the HTML report.
User trigger allowed	Checkbox	Selected	If checked a user can trigger this report from within the Viewer otherwise the report can only be generated automatically by timer/schedules.
Mail recipient(s)	Text	[Empty]	The recipient address(es) of the generated mail NOTE: If more than one, separate addresses with semicolon

Name	Kind	Default Value	Comment
Mail subject	Text	[Empty]	The subject of the generated mail; if the subject is empty the name of the report, the server host name and the report time is used instead
Mail from	Text	[Empty]	The sender address of the generated mail; must be a valid mail address
Save report	Checkbox	Unselected	If checked a copy of the report will be saved within the report directory.

The contents of each report can be modified via the template files. The template files need to follow certain rules which are listed in a separate document.

When a report is generated the event trigger time and the interval is used to calculate the start and end time of the report. For example if a report is configured with an interval of 1 day and the generation is triggered by a user the report starts 24 hours ago until now.

If the **"Generate PDF"** property is checked a mail is sent with the report as attachment. If a report template uses extra files like CSS style-sheets or images (e.g. company logo, etc) a PDF should be used because only the HTML report would be included in a mail but no the external files.

Test report

Name	Kind	Default Value	Comment
End time of report	Date/time selector	Now	Set the time for which the test report will be generated.
Create Test Report	Button		Creates the report immediately using the time specified in the **End time of report field** as point of reference.

4.2.13 Rules

The rules engine processes events occurring in a specified area. If the rule is successful then an alarm is generated which may be used for example to execute a script or a workflow.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Select the rule type (see below).
Duration	4 number fields	0h 0m 0s 0ms	Edit the time frame in which the objects, events and states are processed by the rule.

Enter One Zone Without Entering Other Zone

In this operation mode the rule is fired when an object enters one zone, but does not enter another zone within the given time frame.

Name	Kind	Default Value	Comment
Area that must be entered first	Drop down list	None	Select the zone that the object needs to enter.
Area that must be entered second	Drop down list	None	Select the zone that the object is not allowed to enter.

In this example the rule event is triggered when an object remains in a zone (Borders) for 8 hours and doesn't enter another zone (Headquarters) during that time.

Enter Zones In Sequence

In this operation mode the rule is fired when an object first enters one zone, then enters the other zone within the given time frame.

Name	Kind	Default Value	Comment
Area that must be entered first	Drop down list	None	Select the zone that the object needs to enter first.

Name	Kind	Default Value	Comment
Area that must be entered second	Drop down list	None	Select the zone that the object needs to enter second.
Distance between areas	Checkbox / Number	Unselected	The maximum distance between both zones (optional).

In this example the rule event is triggered when an object is first detected by a camera in one zone (Borders) and then in another one (Headquarters) within 10 minutes.

Minimum Number Of events Raised Simultaneously

In this operation mode the rule is fired when a minimum number of events is fired within the given time frame.

Name	Kind	Default Value	Comment
Count of events that raise an alarm	Number	0	The number of events that need to be fired.
Object must be inside this area	Drop down list	None	The area that an object needs to be in (optional).

Name	Kind	Default Value	Comment
Distance between events	Checkbox / Number	Unselected	The maximum distance between events (optional).

In this example the rule event is triggered when in a building an event is raised 10 times (either camera drops out or sensor device alarms).

Verify Events By Events Of Different Type

In this operation mode the rule is fired when a minimum number of events (of different types) is fired within the given time frame.

Name	Kind	Default Value	Comment
Count of events that raise an alarm	Number	0	The number of events that need to be fired.
Object must be inside this area	Drop down list	None	The area that an object needs to be in (optional).
Distance between events	Checkbox / Number	Unselected	The maximum distance between events (optional).

In this example the rule event is triggered when in a building one of the events is raised (either camera drops out or sensor device alarms).

4.2.13.1 Rule Parameters

Depending on the rule type, edit device/events and state parameters.

Devices

Name	Kind	Default Value	Comment
Type	Drop down list	[Empty]	Filter by device type.
Object	Drop down list	Selected	Filter by device object or consider all devices if not set.
Add	Button		Add a new entry into the devices list.
Remove	Button		Remove the selected entry from the devices list.

Events

Name	Kind	Default Value	Comment
Type	Drop down list	[Empty]	Filter by device type.
Object	Drop down list	Selected	Filter by device object or consider all devices if not set.
Event	Drop down list	Selected	Filter by event or consider all events if not set.
Add	Button		Add a new entry into the events list.
Remove	Button		Remove the selected entry from the events list.

States

Name	Kind	Default Value	Comment
Type	Drop down list	[Empty]	Filter by device type.
Object	Drop down list	Selected	Filter by device object or consider all devices if not set.
Edit	Button		Open a dialog to edit the list of states.
Inverse	Checkbox	Unselected	Negate the states (e.g. criteria is true when the states are not set)
Add	Button		Add a new entry into the states list.
Remove	Button		Remove the selected entry from the states list.

A list of states can be added to an entry. For more information on states see GIS / Avatar / Status.
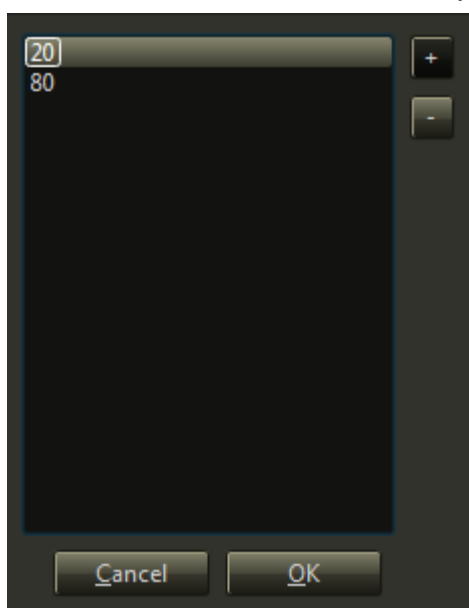
4.2.13.2 Events

Add events to this device. This includes the common events described in Events.

Device specific events

Name	Comment
RuleFired	Triggered when the rule matches the defined criteria.

4.2.14 Schedules

A schedule can be used to generate events when a time period begins or ends. For example a weekend schedule can be configured to trigger an event when the weekend starts to disable certain cameras and re-enable them when the weekend ends.

Name	Kind	Default Value	Comment
Granularity	Drop Down List	30	The resolution of a day in [min]
Daily	Checkbox	Unselected	If checked, only one day has to be configured for a whole week
Holidays	Drop Down List	Ignore holidays	Select how holidays affects this schedule: **Ignore holidays** - holidays will not affect this schedule at all **Only on holidays** - The schedule will be affective on holidays only **Not on holidays** - The schedule will be affective only outside of holidays

In this example the schedule will work every time (ignoring any holidays):

4.2.14.1 Holidays

For the schedulers a holiday list can be maintained on this tab page by adding and removing single entries or importing CSV files. A 'outlook.hol' file can also be used to import holidays.

Format for files is:

[Country or Description]

<Name of holiday or event>,<YYYY/MM/DD>

<Name of holiday or event>,<YYYY/MM/DD>

<Name of holiday or event>,<YYYY/MM/DD>

...

in each line.

After pressing the **Import...** button the user will be asked which country/location/description should be imported. After selected the dates to import the system entries will be created.
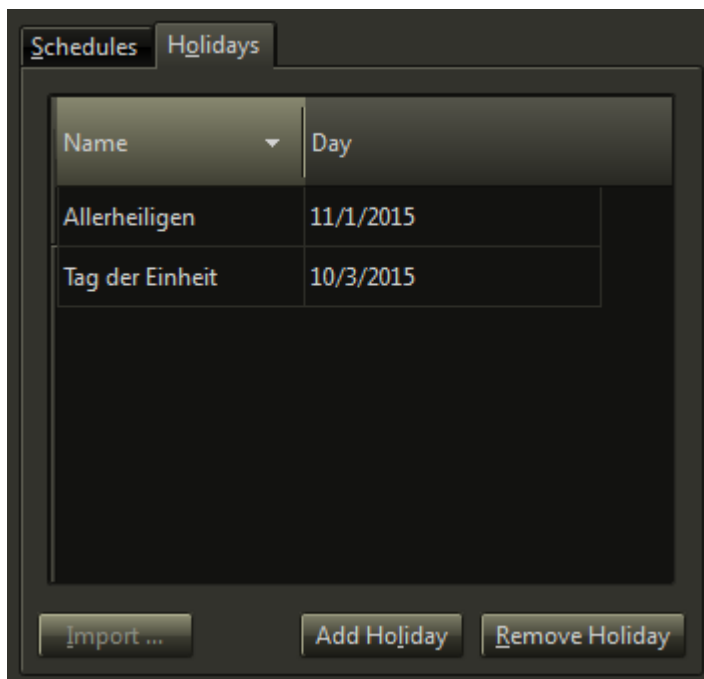
4.2.14.2 Events

Add events to this device. This includes the common events described in <u>Events</u>.

Device specific events

Name	Comment
On	Triggered when the schedule switches to the on state.
Off	Triggered when the schedule switches to the off state.

4.2.15 Script Engine

The script engine is a powerful tool to control and automate the TERRA 4D system.

It is possible to write custom scripts in Python language or put together high level scripts without any required programming skills.

General Properties

Name	Kind	Default Value	Comment
Shortcut	Drop down list	No shortcut	Keyboard button that runs the script from Viewer.
Description	Text	[Empty]	Readable description that is visible to the user.
Ignore high level script errors	Checkbox	Unselected	When a high level function fails then the script is usually terminated. If this option is set then the script will continue and ignore any errors. WARNING: use carefully because subsequent function calls might not work as expected
User execution allowed	Checkbox	Unselected	If checked this script will show up in a viewer tree showing scripts. NOTE: For client scripts only.

There are different script types:

Script Types

Name	Comment
Client scripts	Scripts that run on client machines only. Typically they are used to control the Viewer.
Server scripts	Scripts that run on the server only.
Helper scripts	Allows you to write script functions that can be used from other custom scripts.

Executing A Script From Event Handler

Every device comes with events and to handle it, attach an Event Handler. In the Event Handler select a client script that is executed when the event is fired.

For example add an Event Handler to the signal lost event of a camera and then executes a script than moves another camera on the location of the dropped out camera.

Actions

Actions can be configured to execute a client/server script and called from Viewer.

Workflows

When Workflows changes from one state to another then a script can be executed as well.

Viewer

Client scripts can be configured so the user can execute them from Viewer using keyboard short-keys or from a script list in device tree.

4.2.15.1 High Level Scripts

Script Properties

Name	Kind	Default Value	Comment
Script environment	Radio button	High level	Switch between high level and custom script.
Helper scripts	Multiple Choice Drop down list	[Empty]	Select the helper scripts that are made available in the current script.

Script Commands

Name	Kind	Default Value	Comment
Script commands	List	[Empty]	The order of commands that are called in the script.
Move down	Button		Move the selected entry down by one.
Move up	Button		Move the selected entry up by one.
Add	Button		Add a new entry at the end of the list.
Edit	Button		Edit the properties of the current command entry.
Copy	Button		Copy the selected entry into the clipboard.
Paste	Button		Paste the last entry from the clipboard.
Delete	Button		Delete the selected command entry.

All available script commands are sorted into various categories:

Communication, Live, Media, PTZ, Script, System, Tracker, Viewer and Web.

When editing an entry then first select the category and then the required command. When this is done it is necessary to setup the parameters that are attached to the command. The parameters might be different for each command.

Click here to see an examples.

4.2.15.1.1 Communication

Hint!	Currently the sipgate service is used to send FAX and SMS messages. See _sipgate_ for more information.

getMessageText

Generates a message text from given sources

Name	Kind	Default Value	Comment
Include position	Checkbox	False	If enabled then include position coordinates.
Object location type	Drop down list	None	Select the type of the location object.
Object location object	Drop down list	NoneNone	Select the required location object.

getUserList

Returns a list of users and resources

Name	Kind	Default Value	Comment
Resources	Multiple drop down list	[Empty]	Select the resources to include in the list.
Users	Multiple drop down list	[Empty]	Select the users to include in the list.

sendEmail

Name	Kind	Default Value	Comment
BCC	Text	[Empty]	"Blind Carbon Copy" - a list of receivers getting a copy but unseen by other receivers, separated by commas.
Body	Text	[Empty]	The message to send
_CC_	Text	[Empty]	"Carbon Copy" - a list of receivers getting a copy, separated by commas.
_To_	Text	[Empty]	A list of recipients, separated by commas.
From	Text	[Empty]	The sender of the EMail.
Subject	Text	[Empty]	The headline of the EMail

sendFAX

Hint!	Currently the sipgate service is used to send FAX messages. See *sipgate* for more information.

Name	Kind	Default Value	Comment
Filename	Text	[Empty]	Full path of a PDF that is being send.
Phone number	Text	[Empty]	Number to send the FAX to.

sendMessage

Sends a message to a list of users and resources using the messaging system of TERRA 4D.

Name	Kind	Default Value	Comment
Message	Text	[Empty]	The message to send to the users or the result from a previous call to getMessageText
Users list	Multiple drop down list	[Empty]	Select the users and resources or pick a result from a previous call to getUserList

sendSMS

Hint!	Currently the sipgate service is used to send SMS messages. See *sipgate* for more information.

Name	Kind	Default Value	Comment
Phone number	Text	[Empty]	Number to send the SMS to.
The text message	Text	[Empty]	Text message that is being send.

4.2.15.1.2 Live

enableDevice

Enable/disable a device

Name	Kind	Default Value	Comment
Device type	Drop down list	None	Select the device type (for example "Zone").
Device object	Drop down list	None	Select the device object (for example "Zone one").
Enable	Checkbox	Unselected	Enable or disable the object.

executeDeviceCommand

Execute a custom device command

Name	Kind	Default Value	Comment
Device action	Drop down list	None	Select the device action (for example "Open").
Device ID	Drop down list	None	Select the device object (for example "Roadblocker").
Use result	Drop down list	Manual setting	The selected device is used by default. Otherwise the result from a previous call to getEventLocation can be used there.

generateReport

Generate the given report and send to designated recipients

Name	Kind	Default Value	Comment
Report ID	Drop down list	None	Select the report you want to generate

exportIncident

Export an incident to PDF and/or send it by email

Name	Kind	Default Value	Comment
Export PDF	Checkbox	Unselected	When checked export the incident to PDF. PDFs are currently stored in the reports directory.
Send email	Checkbox	Unselected	When checked send the incident by email with the PDF as attachment.
Incident ID	Drop down list	None	Select the incident you want to export.
Use result	Drop down list	Manual setting	The incident is used by default. Otherwise the result from a previous call to getTriggeringObject can be used there.

getEvent

Retrieves an event handler from a device event

Name	Kind	Default Value	Comment
Device type	Drop down list	None	Select the type of the device object.
Device object	Drop down list	None	Select the required device object.
Event	Drop down list	None	Select the required event

getProperty

Retrieves a value from a device property

Name	Kind	Default Value	Comment
Device type	Drop down list	None	Select the type of the device object.
Object	Drop down list	None	Select the required device object.
Property	Drop down list	None	Select the required event

raiseUserAlarmFromLocation

Raise a live event on a given location

Name	Kind	Default Value	Comment
Event handler	Drop down list	None	Select the event that is fired.
Location type	Drop down list	None	Select the location type (for example "Building").
Location object	Drop down list	None	Select the location object (for example "Wynn Tower").
Event text	Text	[Empty]	The text that is shown to the user.
User	Drop down list	None	Select the user account on which the event is fired.

raiseUserAlarmFromPosition

Raise a live event on a given coordinate

Name	Kind	Default Value	Comment
Event handler	Drop down list	None	Select the event that is fired.
Position Lat/Lon	2 numbers, separated by comma	[Empty]	Enter the Latitude/longitude coordinates.
Format	Drop down list	None	Specify the coordinates format.
Sea elevation	Number	[Empty]	Enter the sea elevation in meters.
Ground elevation	Number	[Empty]	Enter the ground elevation in meters.
Event text	Text	[Empty]	The text that is shown to the user.
User	Drop down list	None	Select the user account on which the event is fired.

setEvent

Sets an event handler for a device event

Name	Kind	Default Value	Comment
Device type	Drop down list	None	Select the type of the device object.
Device object	Drop down list	None	Select the required device object.
Event	Drop down list	None	Select the required event
Use result	Drop down list	Manual setting	The selected event is used by default. Otherwise the result from a previous call to getEvent can be used there.

setProperty

Sets a value for a device property

Name	Kind	Default Value	Comment
Device type	Drop down list	None	Select the type of the device object.
Object	Drop down list	None	Select the required device object.
Property	Drop down list	None	Select the required event
Value	Text	None	Type the value for the property. Otherwise the result from a previous call to getTriggeringObject can be used there.
Use result	Drop down list	Manual setting	The selected event is used by default. Otherwise the result from a previous call to getProperty can be used there.

4.2.15.1.3 Media

playSound

Play a sound file

Name	Kind	Default Value	Comment
File name	Text	[Empty]	Name of the sound file. File needs to be located in the TERRA 4D audio directory on the server.

center

Center the PTZ camera on a location

Name	Kind	Default Value	Comment
PTZ camera	Drop down list	None	Select the required PTZ camera.
Object location type	Drop down list	None	Select the type of the location object.
Object location object	Drop down list	NoneNone	Select the required location object.
Use result	Drop down list	Manual setting	The object location is used by default. Otherwise the result from a previous call to getEventLocation can be used there.

zoom

Zoom the PTZ camera

Name	Kind	Default Value	Comment
PTZ camera	Drop down list	None	Select the required PTZ camera.
Zoom	Number	[Empty]	The zoom value (0..100).

4.2.15.1.5 Script

getEventLocation

Return the location object of the triggering event

Name	Kind	Default Value	Comment
location	Text	location	Name of the result variable.

getEventPosition

Return the GPS coordinate of the triggering event

Name	Kind	Default Value	Comment
Event position	Text	position	Name of the result variable.

getEventTime

Return the alarm time of the triggering event

Name	Kind	Default Value	Comment
Event time	Text	timestamp	Name of the result variable.

getTriggeringObject

Return the alarm time of the triggering event

Name	Kind	Default Value	Comment
Triggering object	Text	object	Name of the result variable.

importAndRun

Import and run another client script

Name	Kind	Default Value	Comment
Client Script	Drop down list	None	Select the client script to execute.

4.2.15.1.6 System

executeShellCommand

Execute a Shell command

Name	Kind	Default Value	Comment
Command	Text	[Empty]	Run a shell command as supported by the underlying operating system.

log

Add text to terra3d logger. This is handy for debugging purposes when editing scripts because the log messages are visible when running it from [Test script](#).

Name	Kind	Default Value	Comment
Level	Drop down list	Debug	Select the logging level.
Text	Text	[Empty]	Type the logging message.

runCode

Run Python code. If a special function is not covered by the high level scripts then you can add custom code easily.

Name	Kind	Default Value	Comment
Code	Text	[Empty]	Enter code in Python syntax.

wait

Pause script execution

Name	Kind	Default Value	Comment
Time	Number	[Empty]	Pause the script for a number of seconds.

4.2.15.1.7 Tracker

flashUnitsMessage

Flash a message on unit(s)

Name	Kind	Default Value	Comment
Message	Text	[Empty]	A message that is send to the unit(s).
Units	Multiple drop down list	None	Select the unit(s) to send the message to.

sendUnitsToPosition

Send unit(s) to specific position

Name	Kind	Default Value	Comment
Message	Text	[Empty]	A message that is send to the unit(s).
Position Lat/Lon	2 numbers, separated by comma	[Empty]	Enter the Latitude/longitude coordinates.
Format	Drop down list	None	Specify the coordinates format.
Sea elevation	Number	[Empty]	Enter the sea elevation in meters.
Ground elevation	Number	[Empty]	Enter the ground elevation in meters.
Units	Multiple drop down list	None	Select the unit(s) to send to the position.

buildingSelect

Select a building in 3D view

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex
Building ID	Drop down list	None	Select the Building object.

buildingSetClippingHeight

Set the clipping height for a building

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex
Clipping height	Number	0.000m	Enter the height at which the building is opened.

buildingSnapToFloor

Snap to a floor in a building

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex
Floor number	Number	0	Enter the floor number at which the building is opened.

centerPTZ CameraList

Center all specified PTZ cameras on a location

Name	Kind	Default Value	Comment
Camera list	Multiple drop down list	Manual setting	Select one or more cameras, or the result from a previous call to <u>getCameraList</u>
Object location type	Drop down list	None	Object type to center the PTZ camera to.
Object location object	Drop down list	None	Select the object to center the PTZ camera to.
Use result	Drop down list	Manual setting	The object location is used by default. Otherwise the result from a previous call to <u>getEventLocation</u> can be used there.

getAreaIndex

Returns the index of an area inside a universal widget

Name	Kind	Default Value	Comment
Media column	Number	[Empty]	The column in the media window.
Media row	Number	[Empty]	The row in the media window.
Window index	Number	[Empty]	The index of the media window.
Area index	Text	areaIndex	Name of the variable to hold the result.

getCameraList

Returns a camera list which can be used by other functions

Name	Kind	Default Value	Comment
Camera range mode	Drop down list	ClosestFirst	BestCameraList: cameras with closest view area first ClosestFirst: cameras located closest first IndoorRadius: indoor cameras within a specific radius InsideRadius: outdoor cameras within a specific radius SameIndoorEntity: cameras in the same indoor entity
Object location type	Drop down list	None	Object type to specify the location.
Object location object	Drop down list	Manual setting	The object location is used by default. Otherwise the result from a previous call to getEventLocation can be used there.
Range radius	Floating-point number	[Empty]	Radius (if needed).

getCameraListFromCategory

Returns a camera list from a given category

Name	Kind	Default Value	Comment
Category	Drop down list	None	The category

getWindowAndAreaIndex

Returns both the index of a universal widget and an area inside it

Name	Kind	Default Value	Comment
Media column	Number	[Empty]	The column in the media window.
Media row	Number	[Empty]	The row in the media window.
Window name	Text	[Empty]	Name of the media window.
Area index	Text	areaIndex	Name of the variable to hold the resulting area index.
Window index	Text	windowIndex	Name of the variable to hold the resulting window index.

getWindowIndex

Returns the index of a universal widget.

Name	Kind	Default Value	Comment
Window name	Text	[Empty]	Name of the media window.
Window index	Text	windowIndex	Name of the variable to hold the resulting window index.

gotoLocation3D

Goto 3D location in Viewer

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
GIS view mode	Drop down list	Top	View from top or behind.
Object location type	Drop down list	None	Object type to specify the location.
Object location object	Drop down list	Manual setting	The object location is used by default. Otherwise the result from a previous call to getEventLocation can be used there.
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

gotoPosition3D

Goto 3D position in Viewer

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
GIS view mode	Drop down list	Top	View from top or behind.
Position Lat/Lon	2 numbers, separated by comma	[Empty]	Enter the Latitude/longitude coordinates.
Format	Drop down list	None	Specify the coordinates format.
Sea elevation	Number	[Empty]	Enter the sea elevation in meters.
Ground elevation	Number	[Empty]	Enter the ground elevation in meters.
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

playbackFast

Fast playback of recorded data

Name	Kind	Default Value	Comment
Playback direction	Drop down list	Forward	Forward or backwards

playbackPause

Pause playback of recorded data

Name	Kind	Default Value	Comment
No parameter			

playbackRealtime

Playback of recorded data in realtime speed

Name	Kind	Default Value	Comment
Playback direction	Drop down list	Forward	Forward or backwards

playbackSetTime

Apply the playback time from an object

Name	Kind	Default Value	Comment
Set playback time	Date/Time picker	Manual setting	Pick a playback time or use an result from a previous call to getEventTime

playbackStep

Move stepwise in recorded data

Name	Kind	Default Value	Comment
Playback direction	Drop down list	Forward	Forward or backwards

playbackStop

Stop playback mode

Name	Kind	Default Value	Comment
No parameter			

playTour

Assign a tour to a universal widget

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex
Tour	Drop down list	[Empty]	Select the tour to play.

restartFiles

Restart all file playback in live module

Name	Kind	Default Value	Comment
No parameter			

setDynVideoCameraList

Specify camera assignment for a dynamic video grid

Name	Kind	Default Value	Comment
Camera list	Multiple drop down list	Manual setting	Select one or more cameras, or the result from a previous call to getCameraList
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

setDynVideoReferenceLocation

Apply a video reference to a dynamic grid by applying a location object

Name	Kind	Default Value	Comment
Object location type	Drop down list	None	Object type to specify the location.
Object location object	Drop down list	Manual setting	The object location is used by default. Otherwise the result from a previous call to getEventLocation can be used there.
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

setDynVideoReferencePosition

Apply a video reference to a dynamic grid by applying a GPS coordinate

Name	Kind	Default Value	Comment
Position Lat/Lon	2 numbers, separated by comma	[Empty]	Enter the Latitude/longitude coordinates.
Format	Drop down list	None	Specify the coordinates format.
Sea elevation	Number	[Empty]	Enter the sea elevation in meters.
Ground elevation	Number	[Empty]	Enter the ground elevation in meters.
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

setLayerVisibility

Show or hide a layer in the terrain

Name	Kind	Default Value	Comment
Layer	Drop down list	[Empty]	The layer to show or hide
Visible	Checkbox	Unselected	Show or hide the layer

setLayerGroupVisibility

Show or hide a layer group in the terrain

Name	Kind	Default Value	Comment
LayerGroup	Drop down list	[Empty]	The layer group to show or hide
Visible	Checkbox	Unselected	Show or hide the layer group

setLayout

Switch to a new layout in Viewer

Name	Kind	Default Value	Comment
Layout	Drop down list	[Empty]	Select a Viewer layout.
Revert on status change	Checkbox	Unselected	Revert to previous layout when status changes.
Revert time	Number	0s	Time to automatically revert to previous layout
Set only if priority is higher	Checkbox	Unselected	Only apply the layout when priority is higher than the previous layout.

setStatusText

Set the status text for the current Viewer step. The counter will be increased automatically.

Name	Kind	Default Value	Comment
Text	Text	[Empty]	Status message for the user.

setVideo

Assign a camera to an universal widget

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
Camera	Drop down list	None	The camera to assign to the universal widget.
View mode	Drop down list	Hotspot	Hotspot: playback with GPS hotspot functionality Measure: paused image with measuring PTZ: playback with PTZ controlling functionality
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

stopTour

Stop a tour previously assigned to a universal widget

Name	Kind	Default Value	Comment
Area index	Number	Manual setting	Value for area index or use an result from a previous call to getAreaIndex or getWindowAndAreaIndex
Window index	Number	Manual setting	Value for window index or use an result from a previous call to getWindowIndex or getWindowAndAreaIndex

toggleLayerVisibility

Toggle visibility of a layer in the terrain

Name	Kind	Default Value	Comment
Layer	Drop down list	[Empty]	The layer to toggle visibility.

toggleLayerGroupVisibility

Toggle visibility of a layer group in the terrain

Name	Kind	Default Value	Comment
LayerGroup	Drop down list	[Empty]	The layer to toggle group visibility.

zoomPTZCameraList

Center all specified PTZ cameras on a location

Name	Kind	Default Value	Comment
Camera list	Multiple drop down list	Manual setting	Select one or more cameras, or the result from a previous call to getCameraList
Zoom	Number	[Empty]	Zoom value (0..100)

4.2.15.1.9 Web

getRelayOutput

Retrieve the state of a relay output (webIO)

Name	Kind	Default Value	Comment
Output	Number	0	The index of the webIO output.
Alarmed	Text	alarmed	Name of the variable to retrieve the result.

toggleAlarmInput

Toggle an alarm input (webIO)

Name	Kind	Default Value	Comment
Input	Number	0	The index of the webIO input.

4.2.15.1.10 Examples

In the following example a small tour is created. A reference location is set in the video view and in 3D view the placemark is shown. After few seconds the next placemark is activated.

There's what happens in the script:

- getWindowIndex / getWindowIndexAndAreaIndex: first off we need to have the window and area Ids of the Video and GIS views. For the video view we only need the windowIndex, which is stored in the result: windowIndexVideo. For the GIS window the results are stored in windowIndexGIS and areaIndexGIS respectively.

- setStatusText: The text "View: Friedrichshafen" or "View: Rome" is shown in the status bar on the bottom. There's also an indication in status bar that this is going to be the first step in the script (automatically determined by the script engine)

- setDynVideoReferenceLocation: An object is selected that is used as reference location for the video view. In this case we have selected a PTZ camera (see screenshot)

- gotoLocation3D: jumps to the location of an object. The windowIndex of the GIS view is used as parameter.

- wait: Pauses the script for 5 seconds

- repeats the steps above with a different location.
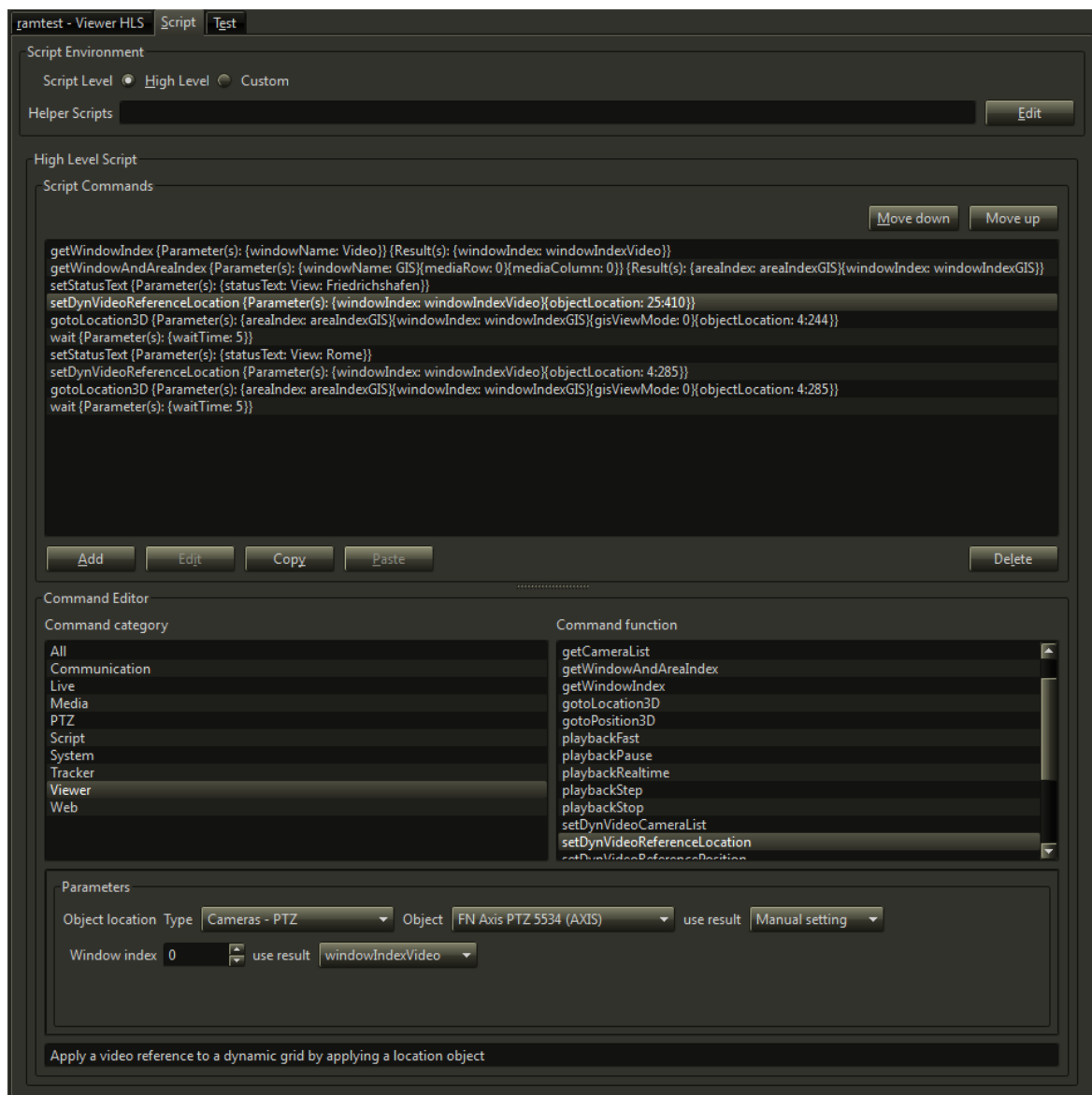
4.2.15.2 Custom Scripts

When the high level commands don't provide the functionality it is possible to write a specific script for this case. Scripts are written in standard Python language.

```
def script_main(self):
    do_something_here()
```

4.2.15.2.1 Helper Scripts

When some custom methods are needed in multiple scripts then they can be added as helper scripts. All functions from a helper script can be accessed from a client/server script.

Name	Kind	Default Value	Comment
Description	Text	[Empty]	Describe the function of the helper script.
Script	Text	[Empty]	The script code consisting of classes or methods that are accessed from other scripts.
Export	Button		Save the script into a file.
Import	Button		Load a script from a file.

4.2.15.3 Test Script

When a script has been edited it is possible to test if it works as intended. Error or log messages from the script are shown in a list in real time.

Name	Kind	Default Value	Comment
Use trigger parameter	Checkbox	Unselected	Enabled when a trigger parameter is forwarded into the script.
Trigger parameter Device type	ComboBox	[Empty]	Device type of the trigger parameter (Alarm or location).
Trigger parameter Device	ComboBox	[Empty]	The selected device that is forwarded as trigger parameter.
Run	Button		Run the current script.
Stop	Button		Stop the currently running script.

	Elapsed Time [ms]	Level	Message
1	1	Debug	HighLevelCommands: Found triggering object: <terra3d.ModelObject object at 0x04FF9140>, Id: 1, Name: ram
2	1	Debug	HighLevelCommands: Found parameters: []
3	1	Debug	HighLevelCommands: request_events False
4	1	Debug	HighLevelCommands: getWindowIndex windowName: Video
5	1	Debug	HighLevelCommands: loading dbus module succeeded
6	21	Debug	HighLevelCommands: getWindowAndAreaIndex windowName: GIS, mediaRow: 0, mediaColumn: 0
7	23	Debug	HighLevelCommands: setStatusText statusText: View: Friedrichshafen
8	0	Debug	HighLevelCommands: setDynVideoReferenceLocation windowIndex: 0, objectLocation: 25:410
9	0	Debug	HighLevelCommands: gotoLocation3D windowIndex: 1, areaIndex: 0, gisViewMode: 0, objectLocation: 4:244
10	6101	Debug	HighLevelCommands: setStatusText statusText: View: Rome
11	0	Debug	HighLevelCommands: setDynVideoReferenceLocation windowIndex: 0, objectLocation: 4:285
12	0	Debug	HighLevelCommands: gotoLocation3D windowIndex: 1, areaIndex: 0, gisViewMode: 0, objectLocation: 4:285
13	12054	Info	HighLevelCommands: Script finished

Script errors are ignored.

Careful! When this warning is shown then script errors will likely not be visible in the log.

4.2.16 Third Party Settings

If third party systems are integrated within the TERRA 4D system, some properties like IP addresses or credentials have to be configured. These settings will be used system wide for e.g. accessing third camera devices.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Type of the third party plugin
Protocol	Drop down list	Native	Which protocol is used to communicate with the plugin: - Native - XML
Is default	Checkbox	Unselected	Check if this is the default *Third Party Setting*. Useful if more than one *Third Party Setting* of the same type is defined,
No auto start	Checkbox	Unselected	Check to start plugin automatically

4.2.17 Timer

The *Timer* device starts after the system (specifically the server) has started. After the defined time an event, defined at *Events* property **Elapsed,** will be created. For example, for checking if an operator is on duty, define an event connected with a workflow which appears every hour and needs to be confirmed.

Name	Kind	Default Value	Comment
Time	Number	0d 0h 0min 0s 0ms	Defines the expiring time
Singleshot	Checkbox	Unselected	If set the timer runs only once, otherwise it starts over again

4.2.17.1 Events

Add events to this device. This includes the common events described in Events.

Device specific events

Name	Comment
Elapsed	Timer has elapsed.

4.2.18 Tracking Devices

Tracking devices track single or multiple objects, e.g. ships, planes or people. Some types of tracking devices may generate alarms or allow send messages to the tracked people.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Select the tracking device type

Name	Kind	Default Value	Comment
Extrapolation interval	Number	0 ms	if not 0, positions will be extrapolated in this interval (milliseconds). Extrapolated objects move smoother, but the shown position may not be accurate and it costs performance especially for small extrapolation intervals.
Inactivity timeout	Number	0 ms	If objects do not change or move for this time, they are considered inactive and will be removed. This avoids showing too many objects on some trackers. The default value 0 means objects will never time out because of inactivity.
Use default accuracy	Checkbox	Unselected	If the tracking device could not report his accuracy, you can set a default value here. Select it and fill field *Default accuracy*.
Default accuracy	Number	0.000m	Default accuracy for the tracking device.
Default: Object avatar	Radio Buttons and Drop Down List	Default	If the tracking device generates objects, they will be shown with this avatar by default. Objects of special type or id can have specific avatars, defined in filters added to the device. Note: By default a default avatar is selected by a radio button. By selecting the custom radio option, a specific avatar can be selected.
Default: PTZ object tracking	Drop down list	No Tracking	Defines the default setting for object tracking with cameras with *'Enable object tracking'* switched on. The tracking mode can be overruled later on the object. *No Tracking* - objects are not tracked. *Normal Priority: Nearest Camera* - objects are tracked by the nearest camera *High Priority: Nearest Camera* - objects are tracked by the nearest camera, overrides tracking of any 'Normal Priority' object *High Priority: All Cameras* - all PTZ cameras that can view the object follow it.

Name	Kind	Default Value	Comment
Height mode	Drop down list	Absolute	Determines how the height from the tracking device is interpreted. *Absolute* - absolute height from sea level *Always on ground* - height from device is ignored, objects are always placed on ground; calculation is based on the elevation map layer *Relative to ground* - same as *"Always on ground"* but an offset is added. *Fixed* - object height is always the same and fixed to a value above sea level *Absolute above ground* - same as *"Absolute"*, but values are adjusted to a minimum height so objects do not fall below ground level
Relative height	Floating point number	0.0 m	For some height modes this gives a relative height in meter that the height from the device is adjusted.
Tracked camera	Drop down list	None	if selected, the tracking device controls the movement of the camera. This is used for moving cameras, e.g. in helicopters or airplanes.
Tracked camera Orientation mode	Drop down list	Azimuth	Controls which Camera parameters are changed by the tracking device. *Azimuth* - only camera azimuth *Azimuth and elevation* - camera azimuth and elevation *All* - camera azimuth, elevation and roll *None* - no camera parameters *Target* - tracker object is a target for the camera, PTZ camera is turned in the direction if the target *Invisible Target* - same as target, but no avatar is shown on the target location
Tracked Camera Platform orientation mode	Drop down list	Azimuth	some tracking devices have a 'platform' object, e.g. the airplane with an PTZ camera on board. This mode determines how the platform object is controlled by the tracker device. *Azimuth* - only platform azimuth *Azimuth and elevation* - platform azimuth and elevation

Name	Kind	Default Value	Comment
			All - platform azimuth, elevation and roll *None* - no platform parameters *Target* - do not use (for testing only) *Invisible Target* - do not use (for testing only)
Device avatar	Drop down list	None	If the tracking device has a position (e.g. ADSB antenna), it will be shown with this avatar. NOTE: Only used if the device has a valid position

4.2.18.1 WebTracker

This is a special tracking device that allows interaction with Android and iOS devices.

Type specific settings:

Name	Kind	Default Value	Comment
WebTracker Url	Text Field	https://track01.fastprotect.net:443/webtracker	*URL of the Webserver that acts as middle-man between the mobile apps and Terra4D.*
User name	Text Field	terra	*Default username for Terra4D Webserver.*
Password	Text Field	6yuxJr2mBa$W	Default password for Terra4D Webserver.
Installation ID	Text Field		Name to identify the WebTracker installation
WebTracker token	Text Field	Auto-generated unique value	Unique token automatically generated by the Terra4D server
Alarm text 1	Text Field	None	Name of the first action visible in the mobile apps.
Alarm text 2	Text Field	None	Name of the second action visible in the mobile apps.
Alarm text 3	Text Field	None	Name of the third action visible in the mobile apps.
Update interval	Drop down list	2sec	Interval for polling the WebServer
HTTP timeout	Drop down list	30sec	HTTP timeout for WebServer connection
Maximum alarm age	Drop down list	15min	Alarms reported from mobile devices are ignored in Terra4D if

Name	Kind	Default Value	Comment
			they are older than the maximum alarm age.
Maximum position age	Drop down list	60min	Position updates from mobile devices are ignored in Terra4D if they are older than the maximum position age.
Minimum position accuracy	Drop down list	100,000m	Position updates from mobile devices with worse accuracy then the minimum position accuracy will be ignored.
Connection timeout	Drop down list	2sec	Connection timeout until a device (or the server) is considered offline
Maximum message age	Drop down list	7days	Determine when old messages are deleted from mobile devices

WebTracker token

The WebTracker token is automatically generated by the Terra4D server. Every Terra4D server needs its own unique token, otherwise the WebServer conflicts with data from different installations. When the Terra4D configuration files are copied between different machines then WebTracker automatically is disabled to avoid conflicts. The user has to solve this conflict in Configurator manually by either generating a new token, or otherwise keep the previous token but ensure that no other installation is using the same token.
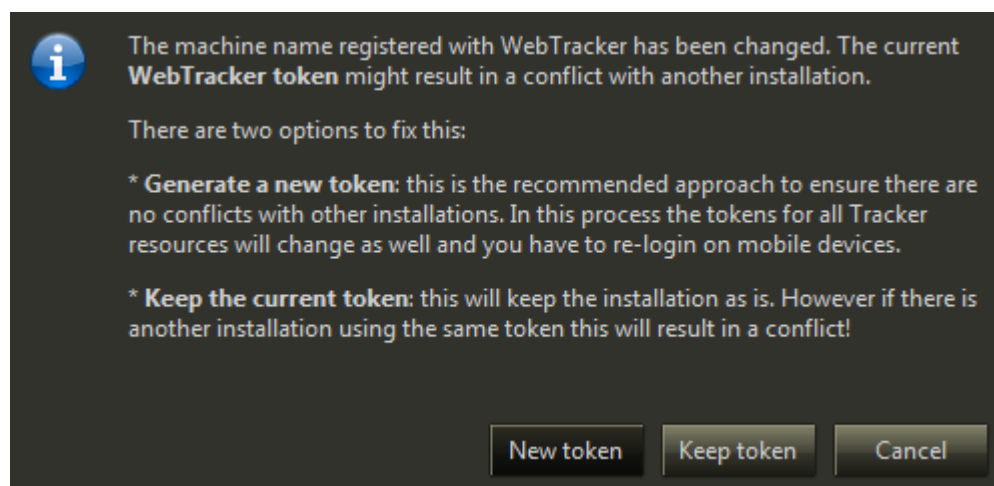
Device specific events

Name	Comment
Alarm button 1 pressed	Alarm button 1 has been pressed on a mobile
Alarm button 2 pressed	Alarm button 2 has been pressed on a mobile
Alarm button 3 pressed	Alarm button 3 has been pressed on a mobile

4.2.18.2 Tracking Device Filter

A text filter for filtering the output of a tracking device. Useful if a tracking device generates many objects with different types and/or names.

Name	Kind	Default Value	Comment
Id filter	Text Field	[Empty]	Filters tracking device generated object property '*Name'*
Type filter	Text Field	[Empty]	Filters tracking device generated object property '*Type'*
Default object avatar	Drop down list	None	If the tracking device generates objects, they will be shown with this avatar by default. Objects of special type or id can have specific avatars, defined in filters added to the device.
Default PTZ tracking mode	Drop down list	OFF	Determines if cameras with 'Auto track objects' enabled track objects from this tracker. The tracking mode can be changed later on the object. *OFF* - objects are not tracked. *Normal Priority: Nearest Camera* - objects are tracked from the nearest camera *High Priority: Nearest Camera* - objects are tracked from the nearest camera, overrides tracking of any 'Normal Priority' object *High Priority: All Cameras* - all PTZ cameras that can view the objects follow it.
Tracked camera	Drop down list	None	If selected, the tracking device controls the movement of the camera. This is used for moving cameras, e.g. in helicopters or airplanes.
Tracked camera orientation mode	Drop down list	Azimuth	Controls which Camera parameters are changed by the tracking device. Azimuth - only camera azimuth

Name	Kind	Default Value	Comment
			Azimuth and elevation - camera azimuth and elevation
			All - camera azimuth, elevation and roll
			None - no camera parameters
			Target - tracker object is a target for the camera, PTZ camera is turned in the direction if the target
			Invisible Target - same as target, but no avatar is shown on the target location
Tracked Camera Platform orientation mode	Drop down list	Azimuth	Some tracking devices have a 'platform' object, e.g. the airplane with an PTZ camera on board. This mode determines how the platform object is controlled by the tracker device.
			Azimuth - only platform azimuth
			Azimuth and elevation - platform azimuth and elevation
			All - platform azimuth, elevation and roll
			None - no platform parameters
			Target -do not use
			Invisible Target - do not use

4.2.18.3 Categories

Define one or more categories for this device.

For further information, see the common topic [Categories](#).

4.2.18.4 Events

Device specific events

Name	Comment
Alarm	The tracking device raised an alarm.

4.2.18.5 Tracked Resources

The list contains all resources. Resources being tracked by the selected tracking device are checked. To set the tracking device for a resource mark the checkbox or uncheck it to remove the tracking device from that resource.
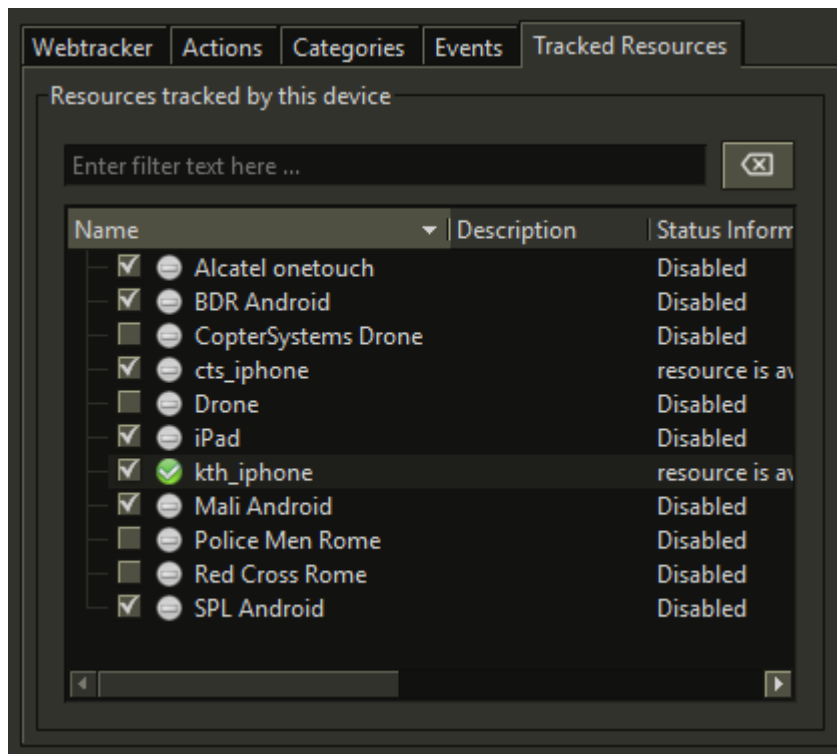
4.3   GIS Properties

This topic describes the static properties available at the different GIS objects. All have automatically the common properties *Id* and *Name*.

The properties are listed in the order of the tree view list.

4.3.1   Avatars

An avatar is used as a visual representation of an object and its current status within the system. The same avatar can be used by multiple devices. E.g. the same avatar can be used for an alarm and a placemark.

If an avatar is selected a temporary placemark is created to visualize the configuration of the avatar inside the 3D GIS view.

Symbol

The symbol properties define the appearance of an avatar in a 3D GIS view. A symbol can either be a 3D symbol or an image (icon).

These properties can be configured for different device states. See the Status tab for details.

Label

A text label above the symbol can be configured to show several status fields of an object and might also contain an additional status icon.

The properties of the text label can be configured for different device states. See the Status tab for details.

Accuracy Disc

If the avatar is used at a tracking device that supports accuracy, these settings are used to display it.

Name	Kind	Default Value	Comment
Accuracy Disk	Checkbox	Selected	Enable or disable the feature.
Enable user color	Checkbox	Unselected	If selected, the user can define an own color. If unselected, the system will choose one automatically.
Color	Text	#ff000000	Custom color to use.

Video Overlay

In a video view objects are marked as icons and the exact appearance can be configured in the Avatar.

The video overlay icon properties can be configured for different device states. See the Status tab for details.

4.3.1.1 Show/Follow

The following properties are used when an object is either shown from top or behind in a 3D view.

Name	Kind	Default Value	Comment
From behind: Distance	Floating-point number	10.0 m	Distance of the camera behind the object.
From behind: Pan offset	Floating-point number	0.0°	Pan offset in [degree] • < 0: show the object from left • = 0: use the same heading as the object • > 0: show the object from right
From behind: Tilt	Floating-point number	-45.0°	Tilt offset in [degree]. • < 0: show the object from above; use for objects on the ground. • = 0: show the object directly from behind; use for objects • > 0: show object from below; use for airborne objects.
From top: Distance	Floating-point number	100.0 m	Distance of the camera above the object

4.3.1.2 Status Visualization

The appearance of an avatar can be specific to a certain status. E.g. if a connection to a camera is interrupted a different symbol can be used or the colorizing effect can be used to change the overall color of the symbol.

Status description format

For the different status description needs a number of different formats can be pre-configured and than selected to show up at various places.

Name	Kind	Default Value	Comment
Status description format: Default	Text	[Empty]	Enter a format string to generate a detailed status string for devices (see description of format here). This can be used in Avatar labels. This description format is used as a fallback if non of the other formats is configured.
Status description format: Short	Text	[Empty]	Enter a format string to display the device status for lists and other GUI elements (see description of format here).
Status description format: HTML	Text	[Empty]	Enter a format string to display the device status for tool tips in device trees (see description of format here, only simple HTML is supported). This format can also be used for reports.
Status description format: Error	Text	[Empty]	Enter a format string to generate a detailed status string for devices (see description of format here). This can be used in Avatar labels.
Status description format: Custom 1	Text	[Empty]	Enter a format string to generate a detailed status string for devices (see description of format here). This can be used in Avatar labels.
Status description format: Custom 2	Text	[Empty]	Enter a format string to generate a detailed status string for devices (see description of format here). This can be used in Avatar labels.
Status description format: Example 1	Text	{?Name}Name:{Name} {?end Name} {?Number}Number:{Number} {?end Number} {?LastUpdate}Last Update:{LastUpdate} {?end LastUpdate}	This read only example can be used to copy and paste some of the more common status properties to be shown inside of a status description. The {?<Property>} and {?end <Property>} is there to test the property value. If the value is empty, than the

Name	Kind	Default Value	Comment
		Results in e.g. Fixed Camera status OK: Name:FN Jct Bnkh Number:111	whole line will not be shown inside the resulting status description.
Status description format: Example 2	Text	{?StatusName}Status Name: {StatusName} {?end StatusName} {?ErrorDescription}Error Description: {ErrorDescription} {?end ErrorDescription} {?StatusValues}Status Values: {StatusValues} {?end StatusValues} Results in e.g. Fixed Camera status video lost: Status Name:Default Error Error description:Video lost	This read only example can be used to copy and paste some of the more common status properties to be shown inside of a status description.

Status displays

There are two default status displays for status OK and status Error. The default error status code numbered '1' is used for all error codes identified by the system as 'NOT OK' and are not individually modified. Normal status OK (status code '0') represents the device if not in error status. These two default status displays can be edited but not be removed.

To individually modify certain status property values, add a new status display with the desired status code and overwrite the property value you need. All other property values are taken from either the OK status display or the Error status display depending of the error status of the status code.

Example of Status displays

Create one entry for each status code. The status code number is device specific. For details about integrated subsystems see TERRA 4D document "Integrated Subsystems". Add or remove a status display by pressing the 'Add' or 'Remove' button respectively.

To edit a status display simply double click the specific list entry or select an entry and press the 'Edit' button in order to show the dedicated edit dialog.

Every new status display inherits its property values from either the OK status display or the Error status display. From which status display the custom status display inherits will be shown inside the edit dialog. In order to overwrite inherited property values, check the corresponding group check box to enable the group and edit the desired property value.
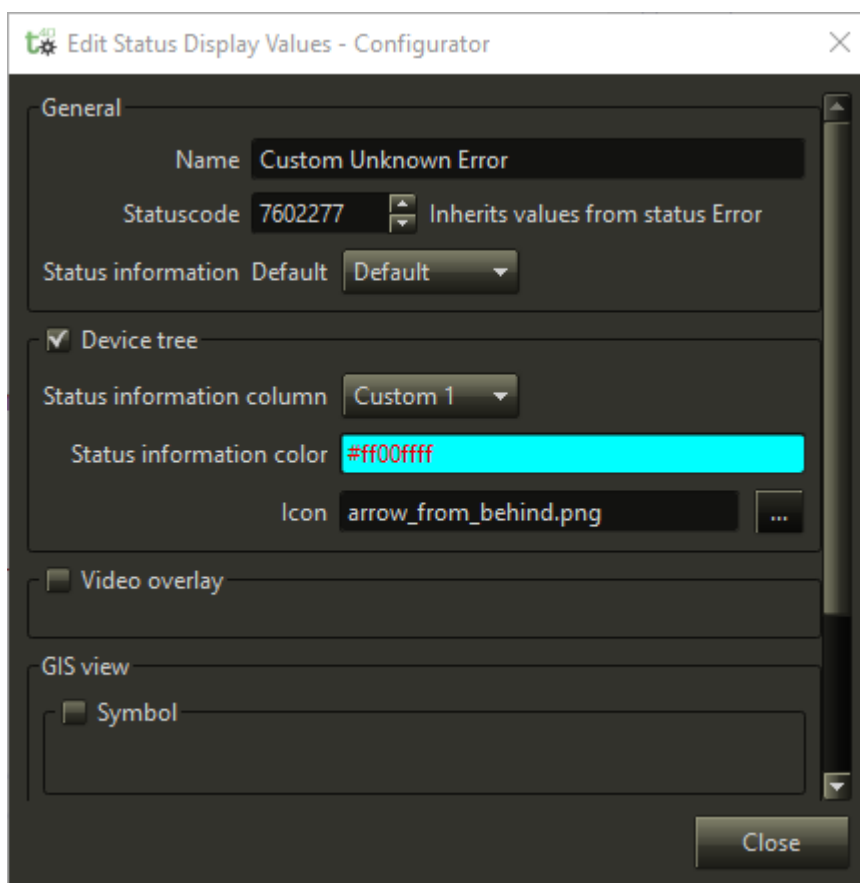
Example of overwritten status property

Name	Kind	Default Value	Comment
Name	Text	[Empty]	Name of the status code
Status code	Number	2	Status code number (device specific). For details about integrated subsystems see TERRA 4D document "Integrated Subsystems" Note: Status code '0' belongs to the status OK and status code '1' belongs to the default Error status code.
Status information format: Default	Drop down list	Default	Selects the description format used as default description
Device tree: Status information column	Drop down list	Short	Selects the description format used in the information column of a device tree
Device tree: Status information color	Color Field	yellow	Color for the status description column of device trees
Device tree: Icon	Text	[Empty]	Icon file used for the tree view entry
Video overlay: Enable video overlay	Checkbox	Unselected	Check for showing either the selected icon or a generic square box inside any

Name	Kind	Default Value	Comment
			video view showing the location to which the edited avatar is located.
Video overlay: Icon	File	[Empty]	Select an icon file to be visible in a video view. If no icon is configured a rectangle appears in the video view.
Video overlay: Fixed Pixel size	Number	10 px	Size of the icon on the video view in pixels.
Video overlay: Use Fixed pixel size	Checkbox	Selected	If enabled the specified icon is re-sized otherwise the icon is drawn using its original size.
GIS view symbol: Symbol/Icon	File	[Empty]	Symbol or icon file for the 3D view
GIS view symbol: Visible Distance	Floating-point number	2000.00 m	Farthest distance to show the avatar.
GIS view symbol: Unlimited	Checkbox	Unselected	If checked the avatar is always visible.
GIS view symbol: Auto rotate	Checkbox	Unselected	Always rotate the symbol to face the screen.
GIS view symbol: Scaling minimal	Ratio	1.0:1	Set the minimum scale factor of the symbol. If the minimal size is less than 1.0 the symbol can appear smaller than is original size.
GIS view symbol: Scaling Maximal	Ratio	10000000:1	Maximum scale factor of the symbol. If set to 1.0 the symbol always appears in its original size.
GIS view symbol: Use Fixed Pixel Size	Checkbox	Unselected	If enable the symbols appears on screen with the specifies number of pixels.
GIS view symbol: Fixed Pixel Size	Number	150 px	Specifies the size of the symbol on screen in pixels.
GIS view symbol fade: Enabled	Checkbox	Unselected	If enabled the symbol uses a fade animation.
GIS view symbol fade: Interval	Number	1000 ms	Length of the fade interval in [ms]
GIS view symbol colorizing: Enabled	Checkbox	Unselected	If enabled the a color animation is used for the symbol
GIS view symbol colorizing: Interval	Number	1000 ms	Length of the colorizing interval in [ms]. Note: If zero the animation is disabled and a fixed amount is used.

Name	Kind	Default Value	Comment
GIS view symbol colorizing: Color	Color Field	red	Color to be used to colorize the avatar
GIS view symbol colorizing: Amount	Floating-point number	0.50	Amount of color applied to the symbol. If amount is zero the original symbol coloring is used. If amount is 1.0 the symbol is drawn with the specified color only. Note: This value is only effective if interval time is zero.
GIS view label format: Always	Drop down list	None	Selects the description format for the label shown on objects in GIS view
GIS view label format: Mouse over	Drop down list	Default	Selects the description format for the label shown on objects in GIS view on mouse over
GIS view label: Icon	Text	[Empty]	Icon file for the label
GIS view label: Fixed Pixel size	Number	64 px	Size of the icon in pixels.
GIS view label: Use Fixed Pixel size	Checkbox	Selected	If enabled the icon is re-sized to the specified size. Otherwise the icon is drawn in its original size.
GIS view label: Use icon provided by device	Checkbox	Unselected	If enabled any icon provided by the device will be shown e.g. Marine Traffic Tracker. Note: Will be ignored if an icon is set manually.
GIS view label: Icon show	Drop down list	Always	Setup whether the label icon is always visible, never visible, or only visible on mouse over
GIS view track markers: Enable track markers	Checkbox	Unselected	Enables track way point markers
GIS view track markers: Symbol/ Icon	File	[Empty]	3D symbol file or image file
GIS view track markers: Fixed Pixel Size	Number	32 px	Specifies the size of the symbol on screen in pixels.
GIS view track markers label format: Always	Drop down list	None	Selects the description format for the label shown on track markers in GIS view

Name	Kind	Default Value	Comment
GIS view track markers label format: Mouse over	Drop down list	Default	Selects the description format for the label shown on track markers in GIS view on mouse over
GIS view track markers: *Label Icon*	File	[Empty]	Select an icon file to be shown over the avatar. For the icon to be visible the Icon must be selected in the "Text fields to show on label" list.
GIS view track markers: *Label Icon Fixed Size*	Number	32 px	Specifies the size of the symbol on screen in pixels.
GIS view track markers: *Use Fixed Pixel Size (Label Icon)*	Checkbox	Unselected	If enabled the icon is re-sized to the specified size. Otherwise the icon is drawn in its original size.

Status Description Format Strings

The format string provides the ability to do device/object properties and status value substitutions and formatting these values. If the format string is empty all status values are returned as formatted list.

Format strings may contain "replacement fields" surrounded by curly braces {}. Anything that is not contained in braces is considered literal text, which is copied unchanged to the output. To include a brace character in the literal text the character need to be escaped by another brace character. E.g. "My status {text}" becomes "My status {{text}}".

The replacement field must start with an identifier that specifies the object whose value is to be formatted and inserted into the output instead of the replacement field. The identifier is optionally followed by a format_spec, which is preceded by a colon ':'. These specify a non-default format for the replacement value, the default format is plain text. Identifier must be a either a device property or a status value. If neither of these is defined, the result of replacement will be an empty string. For example to include the Number field in the string write "{Number}", which results in the text "12" for a device with the Number property set to 12.

Format_spec depends from type of the formatted value. In current implementation it can contain any characters except right curly brace '}'. The following format specifiers are available:

Field type	Specifier	Description
String	None	
Integer/ Unsigned	%i %u %x %08x	format the signed number in base 10 format the unsigned number in base 10 format the number in base 16
Float/ Double	%f %0.2f	format a floating point number with the maximum available precision format using only 2 decimal places
Date/time	None	Use default system localized date/time format.

Field type	Specifier	Description
	date time expression	See below

Date/time expression

Expression	Output
d	the day as number without a leading zero (1 to 31)
dd	the day as number with a leading zero (01 to 31)
ddd	the abbreviated localized day name (e.g. 'Mon' to 'Sun'). Uses the system locale to localize the name.
dddd	the long localized day name (e.g. 'Monday' to 'Sunday'). Uses the system locale to localize the name.
M	the month as number without a leading zero (1-12)
MM	the month as number with a leading zero (01-12)
MMM	the abbreviated localized month name (e.g. 'Jan' to 'Dec'). Uses the system locale to localize the name.
MMMM	the long localized month name (e.g. 'January' to 'December'). Uses the system locale to localize the name.
yy	the year as two digit number (00-99)
yyyy	the year as four digit number
h	the hour without a leading zero (0 to 23 or 1 to 12 if AM/PM display)
hh	the hour with a leading zero (00 to 23 or 01 to 12 if AM/PM display)
H	the hour without a leading zero (0 to 23, even with AM/PM display)
HH	the hour with a leading zero (00 to 23, even with AM/PM display)
m	the minute without a leading zero (0 to 59)
mm	the minute with a leading zero (00 to 59)
s	the whole second without a leading zero (0 to 59)
ss	the whole second with a leading zero where applicable (00 to 59)
z	the fractional part of the second, to go after a decimal point, without trailing zeroes (0 to 999). Thus "s.z" reports the seconds to full available (millisecond) precision without trailing zeroes.
zzz	the fractional part of the second, to millisecond precision, including trailing zeroes where applicable (000 to 999).
AP or A	use AM/PM display. A/AP will be replaced by either "AM" or "PM".
ap or a	use am/pm display. a/ap will be replaced by either "am" or "pm".
t	the timezone (for example "CEST")

4.3.1.3   Status Codes

This is the list of device status codes

Device	Type	StatusCode	Description
Common Devices	Various	0	ok
Common Devices	Various	1	loading
Common Devices	Various	2	unknown error
Common Devices	Various	3	disabled
Common Devices	Various	4	invalid type
Common Devices	Various	5	status plugin disabled
Common Devices	Various	6	status plugin not found
Common Devices	Various	7	not yet created
Common Devices	Various	8	finished
Common Devices	Various	19	disarmed
Common Devices	Various	400	ok
Common Devices	Various	401	file not found
AcquisitionServer	Various	600	ok
AcquisitionServer	Various	601	server not found
AcquisitionServer	Various	800	ok
AcquisitionServer	Various	810	file not found
AcquisitionServer	Various	820	usb camera not found
AcquisitionServer	Various	830	no connection
Alarm Device	Various	9	alarm raised
Alarm Device	Various	10	alarm finished
Alarm Device	Various	11	alarm pending
Alarm Device	Various	12	alarm
Alarm Device	Various	402	alarmed
Camera	Alpha Technology	300	ok
Camera	Alpha Technology	301	invalid property in ALPHA
Camera	Alpha Technology	302	no ALPHA license
Camera	Alpha Technology	303	ALPHA hardware error
Camera	Alpha Technology	304	disabled in ALPHA
Camera	Alpha Technology	305	ALPHA loading

Device	Type	StatusCode	Description
Camera	Alpha Technology	306	ALPHA failure
Camera	Alpha Technology	307	invalid system number
Camera	Alpha Technology	308	no connection
Camera	Alpha Technology	309	Bitfilter alarmed
Camera	Alpha Technology	310	Bitfilter invalid state
Camera	Axis	200	ok
Camera	Axis	201	no connection
Camera	Axis	202	not a known AXIS device
Camera	Axis	203	wrong AXIS api version
Camera	Axis	204	wrong AXIS device type
Camera	Axis	205	unauthorized
Camera	MaxPro	1000	ok
Camera	MaxPro	1001	alarmed
Camera	MaxPro	1002	no connection
Camera	MaxPro	1003	wrong api version
Camera	MaxPro	1004	unauthorized
Camera	MaxPro	1005	not available
Camera	MaxPro	1006	disabled
Camera	Various	500	ok
Camera	Various	501	file not found
Communication	Various	20	outgoing call
Communication	Various	21	incoming call
Communication	Various	22	outgoing SMS
Communication	Various	23	incoming SMS
Communication	Various	24	position
Relay Device	Various	13	state unknown
Relay Device	Various	14	off
Relay Device	Various	15	on
Relay Device	Various	16	switching on
Relay Device	Various	17	switching off
Relay Device	Various	18	switching stopped

Device	Type	StatusCode	Description
Serial Devices	Various	250	ok
Serial Devices	Various	251	no connection to remote host
Serial Devices	Various	252	could not open serial port
Video Management System	ISS	1100	armed
Video Management System	ISS	1101	disarmed
Video Management System	ISS	1102	alarmed
Video Management System	ISS	1103	detached
Video Management System	ISS	1104	disarm_detached
Video Management System	Various	100	VM active
Video Management System	Various	101	VM alarm
Video Management System	Various	102	VM revision
Video Management System	Various	103	VM technical failure
Video Management System	Various	104	VM video failure
Video Management System	Various	105	VM inactive timer
Video Management System	Various	106	VM inactive
Video Management System	Various	107	VM control display
Video Management System	Various	700	ok
Video Management System	Various	701	recording volume invalid
Video Management System	Various	702	recording volume full

4.3.1.4 Track

Object Track

An object track visualizes the past and future positions of an object. Only detected objects which moved since their creation have a track. The future track is only visible when playback mode is active and an object moved in the time after the current playback time.

Track markers can be configured to represent the various track points. The track marker properties can be configured for different device states. See the [Status](#) tab for details.

Name	Kind	Default Value	Comment
Track: Width	Number	4 px	Width of the object track in pixels.
Track: Ground clearance	Floating-point number	0.0 m	Offset to draw the object track above the original position. This can be used if the original position is likely to be below the terrain surface.
Track: Interconnection type	Drop down list	Direct	Selects how two adjacent points of an object track are connected: • Direct: straight line • Half Sine Air Wave: use an arc line which raises above the ground.
Track: Enable user color	Checkbox	Unselected	If checked a user defined color for the object track is used. Otherwise a random color is used.
Track: Color	Color Field	None	If the "Enable user color" is checked a custom color for the object track can be selected. With double click, the **Select Color** window opens.
Track: Highlight color	Color Field	None	If the "Enable user color" is checked a custom highlight color for the object track can be selected. With double click, the **Select Color** window opens.

4.3.1.5 Camera Visualization

For visualizing of viewing angles and direction (*'Frustum'*) and the actual video stream of a camera (*'Videowall'*) inside the GIS view, several properties can be edited. If a single camera needs special settings, these properties can be overwritten by [camera properties](#).

Name	Kind	Default Value	Comment
Videowall: enabled	Checkbox	Selected	Enables/disables the videowall shown in GIS view at the camera
Videowall: Distance	Floating-point number	5.00 m	Defines the distance of the videowall from the camera

| Name	Kind	Default Value	Comment
Videowall: Elevation	Floating-point number	0.00 m	Defines the height difference from the axes of the camera view
Videowall: Size	Floating-point number	2,00 m	Defines how big the wall is displayed
Videowall: as billboard	Checkbox	Unselected	If yes, the videowall is oriented to you to show always the video. If no, the videowall is only be visible from the line of sight of the camera.
Frustrum: enabled	Checkbox	Selected	Enables/Disables the representation of the camera covered area in the GIS view
Frustum: Distance	Floating-point number	5.00 m	How long, starting from the camera position, the frustum is drawn
Frustum: Color	Color Field	Blue	With double click, the **Select Color** window opens.

4.3.1.6 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

4.3.1.7 Avatar Devices

Locations Showing This Avatar

The list contains all locations and the locations which use this avatar are checked. To use the avatar for a location in the list mark the checkbox or uncheck it to remove the avatar from the location. When an avatar is removed from a location the avatar for this location is set to 'None'.
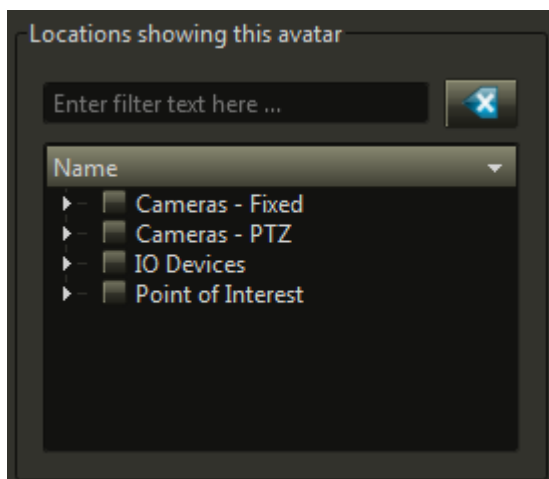
Objects Showing This Avatar

The list contains all devices which can create objects and devices which uses this avatar as default for newly created objects.If the checkbox is checked the devices uses the avatar as 'Default avatar' for new objects. When the checkbox is changed from checked to unchecked the 'Default avatar' is set to None.
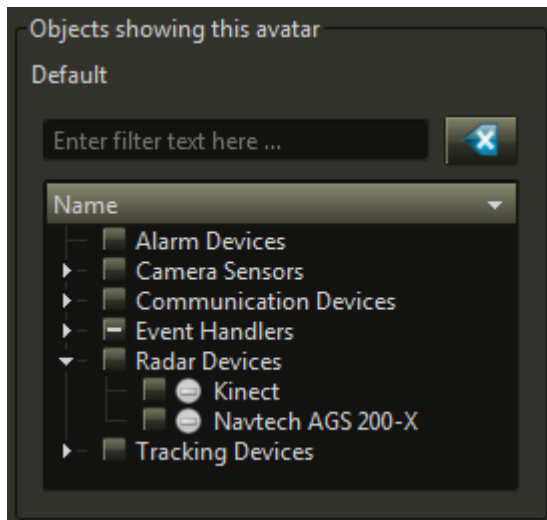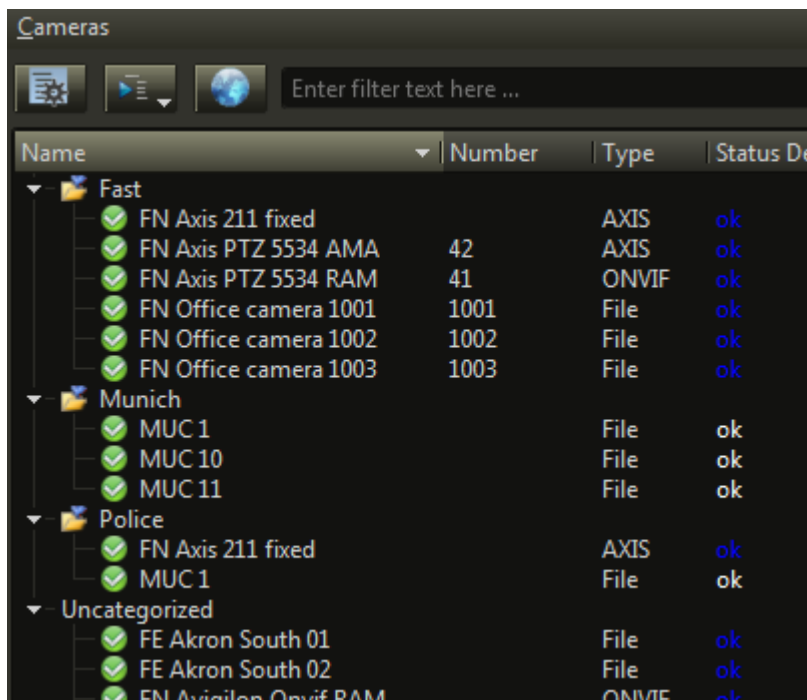

4.3.2   Categories

A category can be used for filtering devices in viewer.

Grouping devices

If the tree filter is changed to *'Categories'* all devices are sorted into their respective categories. If a device is a member of more than one category it will appear in every category. Devices not member of any category will be listed in the *'Uncategorized'* section.

Viewer device tree example: Sorted by categories

4.3.2.1   Member devices

The list contains all devices which can have categories and the devices which use this category are checked. To set the category for a device in the list mark the checkbox or uncheck it to remove the category from the device.

4.3.3   Communication Display Types

Communication Display Types adjusts the appearance and visibility of Communication Devices depending on the distance.

Name	Kind	Default Value	Comment
Visible Distance: Minimum	Floating-point number	0.0 m	Setup the minimum / maximum range for this entry
Visible Distance: Maximum	Floating-point number	2.0 km	
Color: Line	Color Field	White	The color of the connection line With double click, the **Select Color** window opens.
Color: Highlight	Color Field	None	The highlight color for the connection line. With double click, the **Select Color** window opens.
Line: Width	Number	4	Width of the connection line in pixel.
Line: Ground clearance	Floating-point number	0.0 m	Offset to draw the connection line above the original position. This can be used if the original position is likely to be below the terrain surface.
Line: Interconnection type	Drop down list	Direct	Selects how two adjacent points of an communication device are connected: • Direct: straight line • Half Sine Air Wave: use an arc line which raises above the ground.
Label: Show	Drop down list	Always	Setup whether the label is always visible, never visible, or only visible on mouse over.
Label: Min height	Floating-point number	1.0 m	Setup the minimum / maximum height for the label.
Label: Max height	Floating-point number	100.0 m	
Add	Button		Add a new entry into the grid.
Remove	Button		Remove the current entry from the grid.

4.3.3.1   Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

4.3.4   Indoor Entities

Indoor entities need to be configured for indoor operations.


Building FAST

When a indoor entity is selected the coordinate axis become visible. The coordinate axis marks the position of the indoor entity and is used as point of origin for child entities.

Common Indoor Entity Properties

| Name	Kind	Default Value	Comment
3D Model Of Entity: *3D model file*	Filename	[Empty]	Select the 3D model file to show in 3D GIS view.
3D Model Of Entity: *Parent is origin of 3D model*	Checkbox	Unselected	If checked the position of the parent entity is used as point of origin for the 3D model otherwise the position of the entity itself is used. *Note*: Positioning of devices inside an indoor entity will be in any case only to the entity which was selected as parent of the to be positioned device.
Extents: Shape Edit	Button		Switches to editing mode to configure the extents for the entity.
Extents: Shape Delete	Button		Deletes the extents of the entity.

Name	Kind	Default Value	Comment
Extents: Height	Floating-point number	2.5 m	Height of the vicinity above the point of origin.
Extents: Basement height	Floating-point number	0.0 m	Height of the basement below the point of origin. This property is only available in vicinities and buildings.

**Height in an indoor entity**
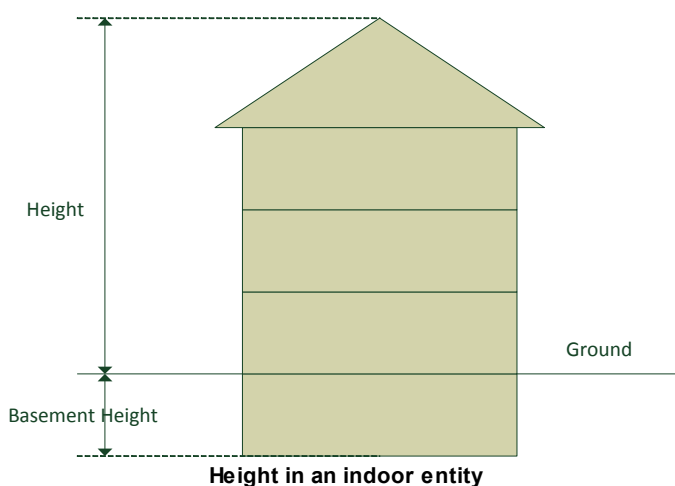
Coordinate System

Each indoor entity (and zone) creates its own (right hand) coordinate system. The X and Y axis specifies the position on the ground while the Z axis specifies the height. The pan orientation angle rotates the coordinate system around the Z axis. For vicinities and global zones the pan orientation is the same as the heading (azimuth) on a compass.

Within a indoor entity or a zone the coordinate axis are straight lines and do not take the earth curvature into account.


Coordinate system and earth curvature
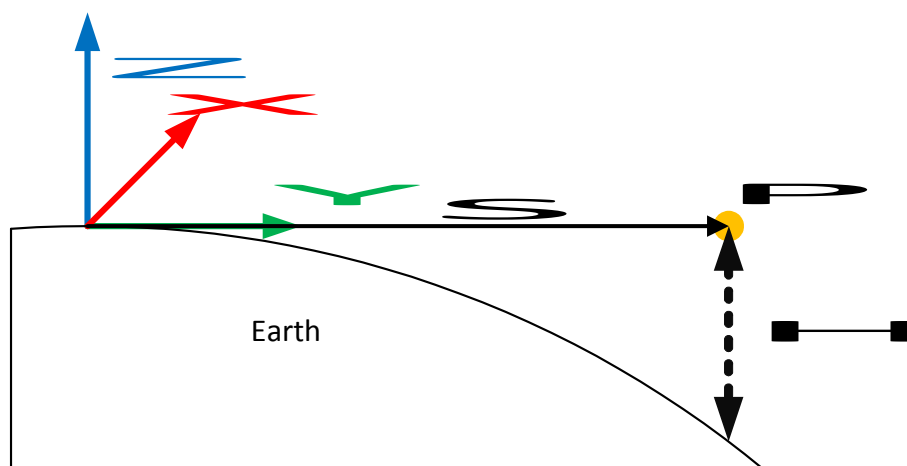
The diagram shows the coordinate axis X,Y and Z. When the distance S (along the Y axis) gets bigger the difference H between the earth curvature and the Y axis increases. As long as S is reasonable small the difference H can be ignored, which is usually the case in indoor entities or zones. This becomes an issue when an indoor entity or zone expands over a vast area for example when a zone is used to cover an entire country.

All positions and orientations of the child entities are relative to the coordinate system of the parent entity. For example the position of a room is relative to the position of the floor it belongs to. When the position of the floor is changed all rooms change the position (relative to the earth) as well.
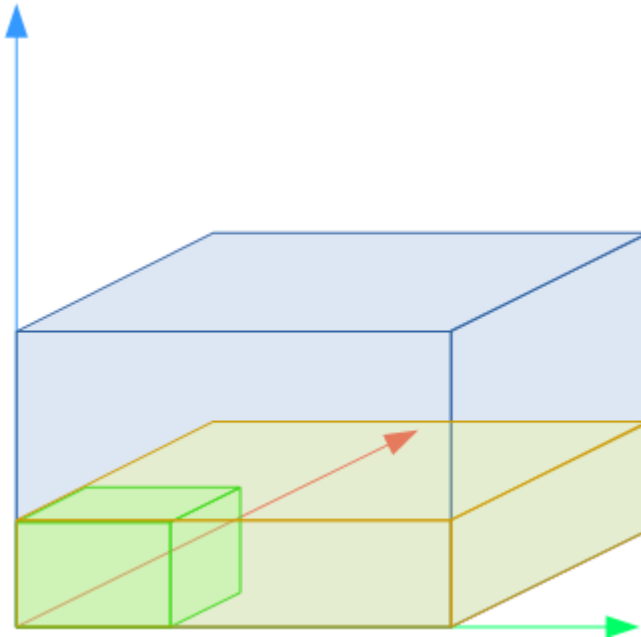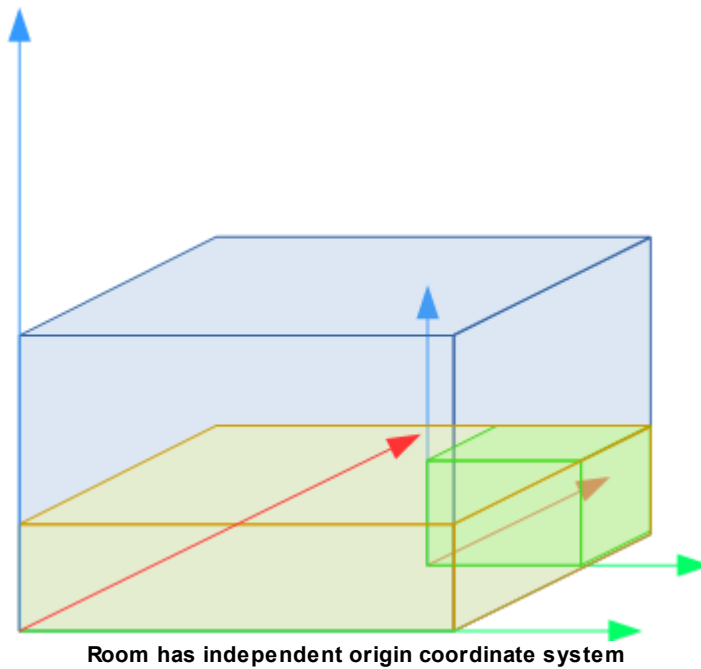

3D Model Coordinate System

A building, floor and room offers the flag **Parent is origin of 3D model** which impacts the positioning of the 3D model of these entities. If the checkbox is checked the 3D model uses the same position as the parent entity as point of origin. This is usually necessary when the 3D model was created as single 3D model and cut into separate pieces afterward. In this case all the sub-models use the same point of origin and therefore the flag must be set.
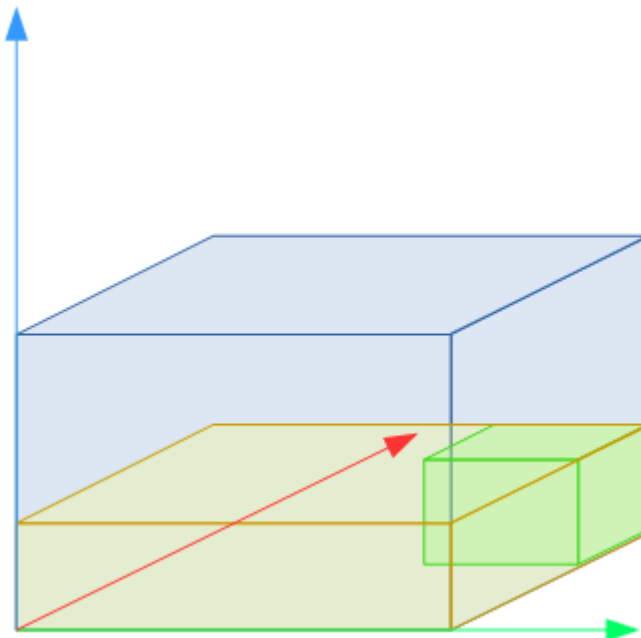
Room has origin coordinate system at the same spot as parent

If the sub-models (e.g. floors) were modeled as separate pieces and each uses its own coordinate system as point of origin, the checkbox for **Parent is origin of 3D model** should be unchecked in order to position the 3D model independent from parent origin.

Room has independent origin coordinate system

Extents

The extents is a polygon which marks the bounds of an entity. The extents are required to determine is a 3D position is inside or outside of an entity. The extents of an indoor entity can be configure by pressing the **Edit** button (within the Extents group box). To remove the existing extents simply press **Delete**.

When starting to edit the extents and no extents are defined yet a default rectangle around the point of origin of the indoor entity is created. To add a new point hold **Ctrl-key** and **left-click** on the terrain. A point is inserted between the two closest points. To delete a point select it and press **'Del-key'**.
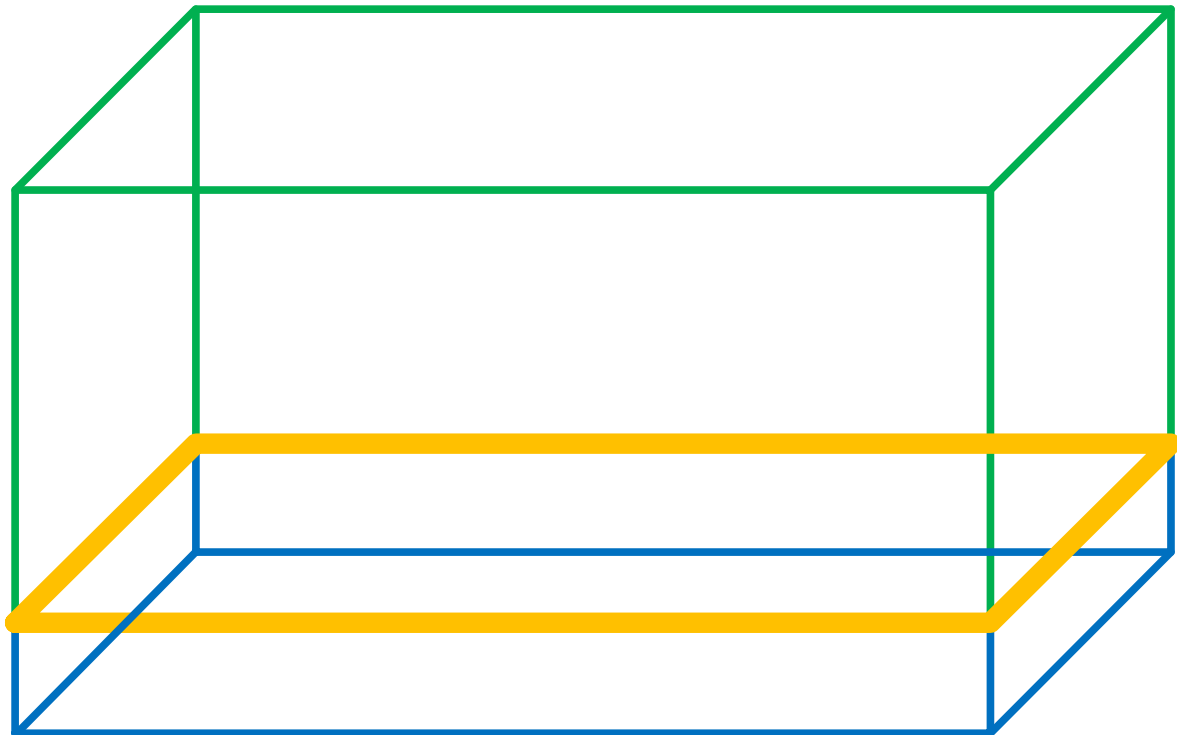
3D Extents of an indoor entity

The 2D extent polygon (orange) combined with the extent height (green) and the basement height (blue; only for buildings and vicinities) form a three dimensional extent (union of the green and blue cube). The three-dimensional extents of two adjacent entities (e.g. two floors or rooms) must not overlap. When two (or more) extents overlap the system cannot determine correctly a single entity from a 3D or 2D coordinate and results in wrong information passed to event handler or scripts.

4.3.4.1 DXF-File Import

The DXF-File import allows importing and updating 3D indoor entities based on 2D AutoCAD drawings. The DXF-file format is the Drawing Interchange File Format specified by Autodesk and designed to exchange data between CAD software programs.

DXF-Files can be imported at vicinity, building and floor entities.

Following devices including their relevant properties can be imported utilizing DXF-Files:

- Building
- Floor
- Room
- Camera (fixed and PTZ)
- Digital Sensor Device
- Point of Interest

The DXF-files need to fulfill some requirements which are listed in a separate document. Also as separate item an AutoCAD template file can be provided.

4.3.4.2   Camera Placement

The camera placement provides a tool to calculate positions for cameras inside a building or surrounding a building.

Algorithm

Name	Kind	Default Value	Comment
Type	Drop Down List	Indoor	Selects the placement algorithm
Recursive	Checkbox	Selected	If checked the algorithm also places cameras inside child entities otherwise only the selected entity will be processed.
Fixed camera	Drop Down List	[Empty]	Choose a fixed camera as template to copy generic camera properties to newly added cameras.
Ignore existing camera	Checkbox	Selected	If checked all existing cameras within a building, floor or room are ignored. *Note*: Disabled, as this is for information only for now.

The following placement algorithms are available:

- Indoor
  Places cameras inside a building

- Outdoor (close)
  Places cameras to cover the near-by area of the building. Only available if a building or vicinity is selected.

- Outdoor (far)
  Places cameras to cover the surrounding area of the building. Only available if a building or vicinity is selected.

The selected fixed camera is used as template to copy the following properties for newly added cameras:

- Type

- Avatar

- Optic

- Videowall settings

- Frustum settings

- Statusbar settings

Mounting

Name	Kind	Default Value	Comment
Interval	Floating-point number	0m	Distance between cameras. If automatic is checked the distance between two cameras is computed automatically otherwise the specified interval is used.
Mounting height	Floating-point number	80%	The mounting height can either be specified by a percentage of the room height or as an absolute number above entity ground.
Tilt angle	Floating-point number	-15 degree	The tilting angle of the camera
Maximum view distance	Floating-point number	0m	If automatic is checked the algorithm computes the maximum view distance automatically otherwise the specified view distance is used.

The calculation can be started by pressing the **Calculate** button. After the process has been started a progress dialog appears which can abort the calculation at any point by pressing **Cancel**. Be aware if the calculation is canceled some buildings, floors or room might have already completed the camera placement and some others might not.

The calculation can be repeated multiple times with the same or different parameters. During the calculation all previously placed cameras are removed and replaced by a new set of cameras.

The camera placement function has some limitations:

- The camera placement provides a simple tool to calculate the camera positions and therefore should only be used in combination with human supervision

- Existing cameras are not taken into account

- Only fixed cameras are used. At the moment PTZ cameras must be placed manually.

- Cameras are placed along the bounding polygon; no cameras are placed for example in the center of a room.

4.3.4.3   Vicinity

A vicinity represents the surrounding area of one or more buildings. For example a building complex with a main building and an auxiliary building use one vicinity as common ground.

Name	Kind	Default Value	Comment
Polygon Type	Drop down list	None	Select Polygon Type to visualize the extents of the vicinity.
DXF-File Import / Update	File	[Empty]	DXF-File for import or update of the 3D model. See DXF-File Import

Buildings property grid

Additionally to the pages regarding the configuration of the vicinity, a grid to see all buildings which have the selected vicinity as parent are listed on the '***Buildings'*** property grid page.

4.3.4.4   Building

Name	Kind	Default Value	Comment
3D Model Of Entity: *Re-Position Model*	Button		Opens an extra dialog to adjust the position of the 3D model relative to the configured position. **Will be enabled only if a model file is defined.** A label beside the button shows the adjusted position of the 3D model.
3D Model Of Entity: *Always show building model*	Checkbox	Unselected	If checked the 3D building model remains visible even when the building is opened in Viewer. The 3D building model will be sliced on the opened floor level.
DXF-File Import / Update	File	[Empty]	DXF-File for import or update of the 3D model. See DXF-File Import

The reposition of the 3D model can be used to do minor position adjustments to the model. This can be helpful in case the 3D model uses a different point of origin than the building.
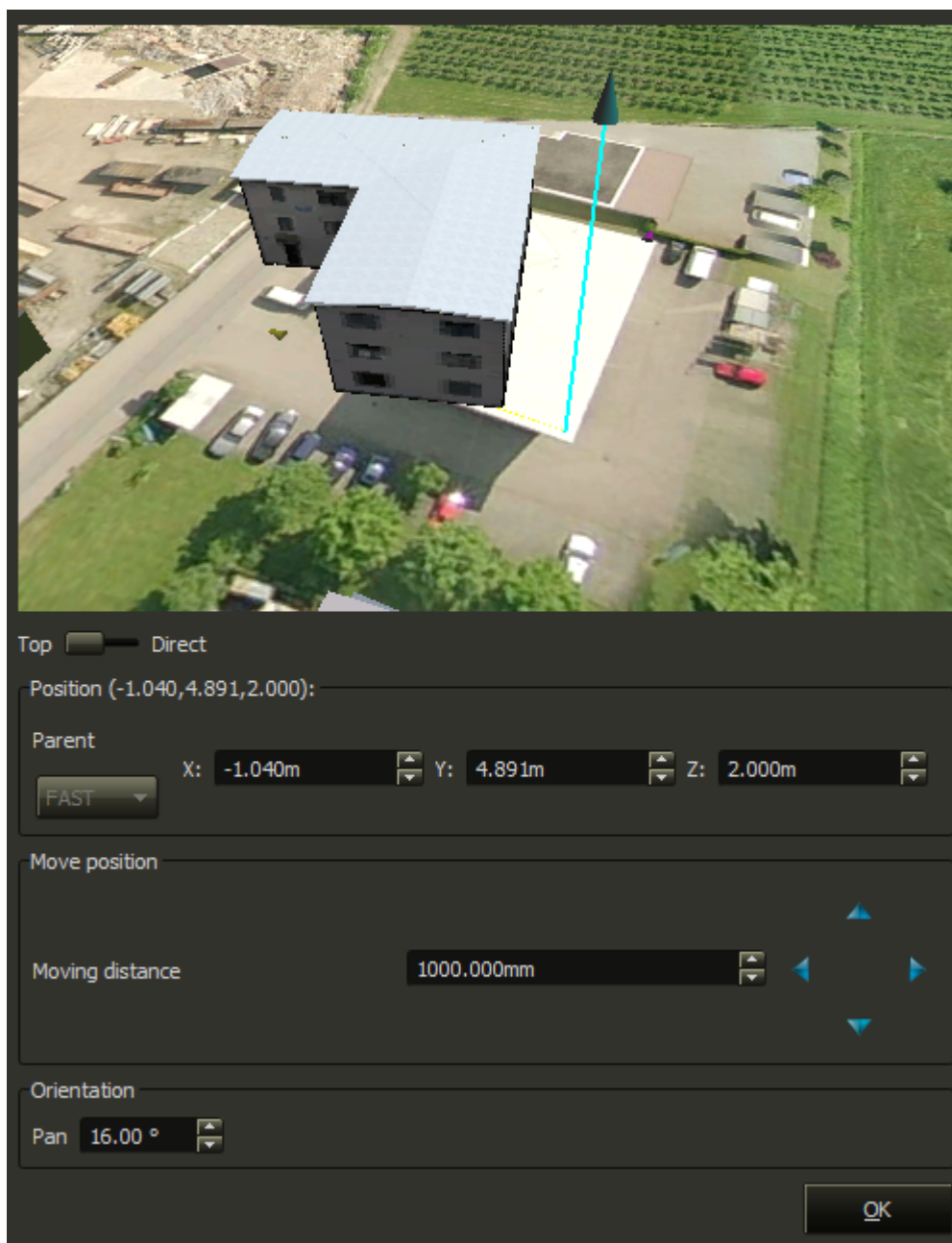
Within the dialog the building can be moved and adjusted to match the ortho imagery or to correct a model offset in a existing 3D building model. The point of origin is marked by the coordinate axis (in cyan). Only the position of the 3D model is changed the actual position of the building entity is unaffected. The position of all child entities (floors and rooms) and all location inside a building are not affected as well.

The position configuration is similar to a position set up of regular location. See 3D View Section.

The position can be either entered into the number fields manually or by using the move position buttons below. The orientation must be entered manually. The positions of the building are relative to the position of the parent vicinity.

Floors property grid

Additionally to the pages regarding the configuration of the building, a grid to see all floors which have the selected building as parent are listed on the '*Floors*' property grid page.

4.3.4.5   Floor

Name	Kind	Default Value	Comment
Floor order number	Number	0	Number of the floor
Extents: Plate height	Floating-point number	0.0 m	Height of the floor plate below the point of origin.
Extents: Absolute height	Floating-point number		The sum of Height and Plate height. *For information only.*
DXF-File Import / Update	File	[Empty]	DXF-File for import or update of the 3D model. See DXF-File Import

The floor order number is used to identify a floor by number and therefore it should be unique for each building. The lowest floor (by position) in a building must have the lowest floor order number and the highest floor must have the highest number. For example the basement is the lowest floor and gets the floor order number -1, the ground floor gets the number 0, the first floor gets 1 and so on.

It is possible to leave out certain floors which are not relevant for operation but it's not recommended. For example a tower with a total of ten floors only the first three floors can be configured if the other floors are not used.

Rooms property grid

Additionally to the pages regarding the configuration of the floor, a grid to see all rooms which have the selected floor as parent are listed on the '*Rooms*' property grid page.

4.3.4.6   Room

A floor can contain any number of rooms.

Name	Kind	Default Value	Comment
Transparent	Checkbox	Unselected	If check the room 3D model is excluded from camera hit tests.

The extents of two rooms should not overlap to avoid trouble of ambiguous locations.

4.3.4.7   Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

4.3.4.8 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.5 Layer Groups

Layer groups are organizing helpers for handling different [*Layers*](Layers) in order to get groups of layers or groups of sub groups of layers to organize any used layers. A layer group can have sub layer groups, but sub layer groups cannot have additional layer groups (sub-sub-layer groups); i.e. the "Global Imagery" layer group can have one sub layer group "Maps". No sub layer groups are allowed for "Maps".

The children of a *Layer group* can either be exclusive or inclusive. If the exclusive flag is set only one of the child layers can be visible at a given time. If the flag is off multiple child layers can be active.

If a parent layer is invisible all children are automatically hidden as well.

The order of the layers is defined by layer classes: e.g. satellite, elevation, map, traffic, poi, weather. The user can customize the layer classes to define the order of the layers.

Name	Kind	Default Value	Comment
Default visibility	Checkbox	Unselected	Whether the layer is visible in the 3D GIS view on start. Note: If the parent of the *(Sub-)Layer Group* is set to exclusive, setting this property to Selected will automatically switch all other children of the parent to Unselected
Children	Radio button group	Inclusive	Whether the children of the group can be selected one by one (exclusive) or if they can be selected accumulated (inclusive)

Note: **'Global Elevation'** and **'Global Imagery'** layer groups properties can not be edited because of their status in the system. They have always default visibility in order to always have a global elevation layer and a global image layer. As it is not possible to add up global image layers, the imagery group is always exclusive. For the elevation group it is just the other way around, they always should be summoned up.

The user can switch layers on or off by using the 'Layer Tree' from inside the GIS view toolbar:
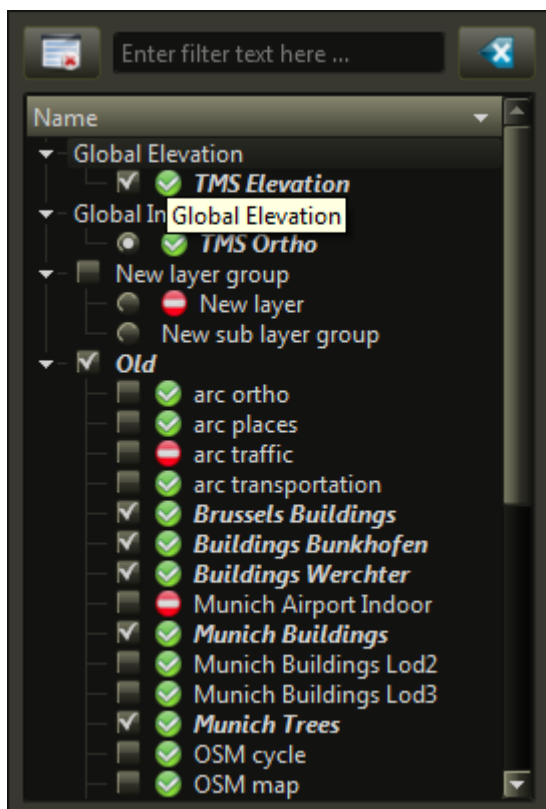
Example of the 'Layer Tree' from GIS view toolbar

4.3.5.1 Layer Classes

A *Layer Class* is used to define the order of the layers. The topmost layer class appear on top and the lowest layer class at the bottom. The layer order is only important to for layers which contain imagery data (like *Ortho*, *Oblique* or *OpenStreetMap*) or elevation data. If a layer is ordered above another it is rendered after the second one. A wrong layer order results in "invisible" imagery or wrong elevation because of covered by another layer.

As a rule of thumb image or elevation layers which cover only smaller areas should be on top of layers which cover the larger areas (or the entire globe).

To change the position of a layer class within the list select a layer class and use the buttons **Move down** and **Move up** to re-order it or use drag and drop in the list.

Default layer classes

A *Layer Class* has these properties:

Name	Kind	Default Value	Comment
Name	Text	[Empty]	Name of the layer class
Description	Text	[Empty]	A short description of the class use
User hidden	Checkbox	Unselected	A layer of a class marked as *User hidden* will not be shown in the selector tree

Move down   Moves a class down in order

Move up   Moves a class up in order

Add Layer Class   Add a new class

Remove Layer Class Remove the selected class

4.3.5.2 Layers

Multiple layers of the same layer class can be ordered specifically by setting the order number of each layer. The actual layer order is defined by layer class and order number within each layer. Each *Layer* can have a center point and radius. This information is used to calculate if a layer is currently visible or not. If the information is missing or invalid it is assumed that the *Layer* is visible.

An additional view point (like a layer placemark) can be configured for each layer. This viewpoint is use to jump directly to layer e.g. via drag and drop.

Name	Kind	Default Value	Comment
Type	Drop down list	Invalid	Defines the behavior of the *Layer* • Elevation • Ortho • Building • Model • Mask
Layer Class	Drop down list	Invalid	Defines the general order of the *Layer*
File	File	[Empty]	File or URL to load the *Layer* from
Opacity	Number	100	Opacity factor of the *Layer*; 0 for fully transparent, 100 for opaque
Default Visibility	Checkbox	Unselected	If checked, the *Layer* will be visible on system start Note: If the parent of the *Layer* is set to exclusive, setting this property to Selected will automatically switch all other children of the parent to Unselected
User Hidden	Checkbox	Unselected	If checked, the *Layer* will not show up in the Viewer *Layer* tree
Order Number	Number	0	If there are two or more layers using the same *Layer class*, this property can be used to define the actual render order of the layers.
Viewpoint		Invalid	This point is used by any action involving the *Layer* and the GIS view
Radius	Number	0 m	Used for calculations involving the *Layer visibility*

Take view from map   Apply the current view from 3D view.

Reset   Reset the viewpoint back to *invalid*

4.3.6   Places Global

Global Places are defined for every client of the system. In opposite to a Point Of Interest the view onto this place is configurable. Define the view to recall that same view inside the Viewer. **Set User View to current view** in context menu.

Name	Kind	Default Value	Comment
Level: Level of use	Drop down list	Global Placemark	There are three levels of use: • Global Placemark: A placemark that can be selected by everyone • Group Placemark: Only members of the corresponding user group can select this placemark • User Placemark: Only the corresponding user can select this placemark
Level: User group	Drop down list	None	The user group to which this placemark belongs to
Level: User	Drop down list	None	The user to which this placemark belongs to
Level: Apply	Button		Applies current placemark changes to level of use / user group / user properties
View: Take from map	Button		Updates current placemark view to the view seen in GIS view
View: Set to map	Button		Sets current placemark view to the GIS view

4.3.6.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.7 Places Group

Group Places can be defined for every user group of the system.

Name	Kind	Default Value	Comment
Level: Level of use	Drop down list	Group Placemark	There are three levels of use: • Global Placemark: A placemark that can be selected by everyone • Group Placemark: Only members of the corresponding user group can select this placemark • User Placemark: Only the corresponding user can select this placemark
Level: User group	Drop down list	The current user group to whom the placemark belongs to	The user group to which this placemark belongs to

Name	Kind	Default Value	Comment
Level: User	Drop down list	None	The user to which this placemark belongs to
Level: Apply	Button		Applies current placemark changes to level of use / user group / user properties
View: Take from map	Button		Updates current placemark view to the view seen in GIS view
View: Set to map	Button		Sets current placemark view to the GIS view

4.3.7.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.8 Places User

User Places can be defined for every user of the system.

Name	Kind	Default Value	Comment
Level: Level of use	Drop down list	User Placemark	There are three levels of use: • Global Placemark: A placemark that can be selected by everyone • Group Placemark: Only members of the corresponding user group can select this placemark • User Placemark: Only the corresponding user can select this placemark
Level: User group	Drop down list	None	The user group to which this placemark belongs to
Level: User	Drop down list	The current user to whom the placemark belongs to	The user to which this placemark belongs to
Level: Apply	Button		Applies current placemark changes to level of use / user group / user properties
View: Take from map	Button		Updates current placemark view to the view seen in GIS view
View: Set to map	Button		Sets current placemark view to the GIS view

4.3.8.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.9 Points Of Interest

Point of Interest is a point with the capability to call actions and could be represented by an avatar, in opposite to Places Global

Name	Kind	Default Value	Comment
Size	Floating-point number	0,00	Describes the dimension of the *Avatar*. Used for video overlays and internal calculations.
Description	Text	[Empty]	Describes the *Point of Interest*

4.3.9.1 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

4.3.9.2 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.10 Polygon Types

With Polygon Types you can adjust the appearance and visibility of polygons depending on the distance. Polygon types are used by vicinities or by zones.

Name	Kind	Default Value	Comment
Visible Distance: Minimum	Floating-point number	0.0 m	Setup the minimum / maximum range for this entry
Visible Distance: Maximum	Floating-point number	2.0 km	
Colors: Show	Drop down list	Line only	None: don't show a polygon Line only: show the polygon contour only Fill only: only show a filled polygon Line and fill: show a filled polygon with contours
Color: Line	Color Field	White	The color of the contour lines With double click, the **Select Color** window opens.
Color: Fill	Color Field	Gray	The color of the polygon fill.

Name	Kind	Default Value	Comment
			With double click, the **Select Color** window opens.
Line: Width	Number	4	Width of the contour lines in pixel.
Line: Ground clearance	Floating-point number	0.0 m	Offset in meters to draw the polygon above the original position. This can be used if the original position is likely to be below the terrain surface.
Symbol	File		3D symbol file or image file
Symbol: Fixed screen size pixel	Number	150	Configure the size of the symbol in pixel.
Label: Show	Drop down list	Always	Setup whether the label is always visible, never visible, or only visible on mouse over.
Label: Min height	Floating-point number	1.0 m	Setup the minimum / maximum height for the label.
Label: Max height	Floating-point number	100.0 m	
Add	Button		Add a new entry into the grid.
Remove	Button		Remove the current entry from the grid.

Preview Entity

Name	Kind	Default Value	Comment
Preview entity	Drop down list		Shows all entities that are using this polygon type.
Show Entity	Button		Shows the selected entity in 3D view.

4.3.10.1 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions..

4.3.11 Sensor Platforms

A Sensor Platform is used to combine several sensors (e.g. cameras, radar devices, IO devices, ...) to one location in order to move that location around. To do this, set the sensor platform as *Parent* in the device *3D View* configuration.

Name	Kind	Default Value	Comment
Fixed	Checkbox	Unselected	If checked, sensor platform is not moved by tracking device, but stationary with own avatar.

Name	Kind	Default Value	Comment
Avatar	Drop down list	Unavailable	Used if *Fixed* is set.
Tracking device	Drop down list	None	The device which tracks the position of the platform. Not available if *Fixed* is set.
Unique identifier	Text	[Empty]	Defines which filter device is in use. Not available if *Fixed* is set.

4.3.11.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.11.2 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic Actions.

4.3.11.3 Events

Add events to this device. This includes the common events described in Events.

4.3.12   Tours

Tours allow you to configure a number of locations that are shown in a batch.

Name	Kind	Default Value	Comment
Overall Speed factor	Floating-point number	1.00	Set the relative speed of the tour to play. A value over 1 increase, between 0 and 1 decrease it.
Play	Button		Play the configured tour.
Stop	Button		Stop a running tour.
Loop play: Type	Drop down list	No loop	No loop: play the tour only once From start: continuously play the tour and repeat from start Forth and back: continuously play the tour forward and back
Loop play: Delay	Number	0 ms	The delay between two repeating tours.
Tour points: Add	Button		Add a new point into the tour.
Tour points: Remove	Button		Remove the current point from the tour.
Tour point: Name	Text	[Empty]	Name of the tour point.

Name	Kind	Default Value	Comment
Tour point: Duration	Number	2000 ms	Duration in milliseconds until the tour moves to the next point.
Tour point: Delay	Number	0 ms	Delay that is used to fly from one point to the next.
Tour point: Take view from map	Button		Apply the current position in 3D view for this point point.

4.3.12.1 Categories

Define one or more categories for this device.

For further information, see the common topic Categories.

4.3.13 Zones

A zone are used to create special area for detection purposes. For example create a zone on a parking lot where parking is reserved for fire emergency vehicles. A alarm can be triggered when an unauthorized vehicle is detected by the system.

A zone can be either defined globally or defined within a indoor entity.

Name	Kind	Default Value	Comment
3D Model	Filename	[Empty]	Select the model to show in 3D GIS view.
Parent is origin of model	Checkbox	Unselected	If checked the position of the parent entity is used as point of origin for the 3D model otherwise the position of the entity itself is used.
Transparent	Checkbox	Selected	If check the zone 3D model is excluded from camera hit tests.
Polygon type	Drop down list	None	Select Polygon Type to visualize the extents of the zone.
Polygon type Alarmed	Drop down list	None	Select Polygon Type to visualize the extents of the zone when in alarmed state.
Polygon type Disarmed	Drop down list	None	Select Polygon Type to visualize the extents of the zone when in disarmed state.
Initial Armed State	Checkbox	Selected	Whether the zone is in armed state on start-up.
Alert Objects	Checkbox	Unselected	If set, all objects alarming the zone will be set into alerted state as well.
Extents: Shape Edit	Button		Switches to editing mode to configure the extents for the zone.

Name	Kind	Default Value	Comment
Extents: Shape Delete	Button		Deletes the extents of the zone. **Will be visible only if a shape is defined.**
Extents: Shape From Radius	Button		Will define a shape from the radius by asking the user how many corners the new shape should have. **Will be visible only if no shape is defined.**
Extents: Shape To Radius	Button		Will convert a defined shape into a circle zone with the radius of the largest extent from the center of the old shape. **Will be visible only if a shape is defined.**
Extents: Radius	Floating-point number	0.0 m	If no shape is defined, the radius for a circle zone can be defined here. **Will be visible only if no shape is defined.**
Extents: Height	Floating-point number	2.5 m	Height of the zone above the point of origin.
Extents: Depth	Floating-point number	0.0 m	Height of the zone below the point of origin.

Extents

By default the extents of a zone is a circle with a given radius. The radius can be changed either by setting it directly, or by pressing the **Edit** button (within the Extents group box) and alter the radius in the circle selection tool shown in the 3D control.

The extents can also be a polygon which marks the bounds of a zone. The extents are required to determine is a 3D position is inside or outside of a zone. The extents of an indoor entity can be configured by pressing the **Edit** button. To remove an existing extents shape simply press **Delete**.

When starting to edit the extents and no extents are defined yet a default rectangle around the point of origin of the zone will be created if the radius is also zero. To add a new point hold `Ctrl-key` and left-click on the terrain. A point is inserted between the two closest points. To delete a point select it and press `Del-key`.

4.3.13.1 Categories

Define one or more categories for this device.

For further information, see the common topic [Categories](#).

4.3.13.2 Actions

Define the action to view at Viewer context menu for this device.

For further information see the common topic [Actions](#).

4.3.13.3 Events

Add events to this device. This includes the common events described in [Events](#).

Zone specific events are listed here:

Name	Comment
ObjectEntered	triggered when an object has entered the zone
ObjectLeft	triggered when an object has left the zone

4.4 User Properties

This capital describes the static properties available at the users. All have automatically the <u>common properties</u> *Id* and *Name*.

The properties are listed in the order of the tree view list.

4.4.1 Resources

A *Resource* is a tracked mobile entity which can send or receive messages e.g. a security guard with the TERRA 4D Mobile Apps. Resources are used in the system for e.g. interventions.

Name	Kind	Default Value	Comment
Description	Text	[Empty]	A description of the resource used for information only
Tracking Device	Drop down list	None	Which <u>tracking device</u> tracks the resource
Token	Text	[Empty]	Unique identifier for the object. Automatically created by the system.
Unique Identifier	Text	[Empty]	Unique ID for the tracking device, e.g. the telephone number
Avatar Type	Text	[Empty]	The graphical representation for the filtered being which represents the resource in any GIS view
Capabilities	Multiline Text	[Empty]	A list of tags to describes the resources capabilities used for information only
Schedule	Drop down list	None	The selected <u>schedule</u> will enable/ disable the resource to indicate its availability

4.4.1.1 Resource States

With the help of Resource States it is possible to define on and of duty states. These states are easily set within the Viewer.

Example of three resource states

Name	Kind	Default Value	Comment
Name	Text	[Empty]	Name of the state. This will be the caption of the menu entry shown in the Viewer
Description	Text	[Empty]	A description of the resource used for information only
Availability	Drop down list	Use Schedule of Resource	Actual state of resource: *Available, ignore Schedule* - The resource will show up in the intervention dialog *Not available, ignore Schedule* - The resource will don't show up in the intervention dialog *Use Schedule of Resource* - The resource will show up in the intervention dialog depending on the schedule

4.4.2   User Groups

User groups are collection of users with the same rights and priorities. This allows for fast management of user rights without changing each single user.

Name	Kind	Default Value	Comment
PTZ priority	Number	1	PTZ priority of the users of this group. Users with higher PTZ priority can take over control of PTZ cameras from users with lower priority. *Note*: The system has its own PTZ priority of *10* for locking cameras while e.g. in auto tracking mode. Thus in order for a user to override the system moved cameras this PTZ priority needs to be *11* or *higher*.
Minimum event priority	Number	1	Events with this or higher priority will show up in the Viewer and brought to attention immediately. Events of lower priority will be shown, but will not disrupt the current work.
Do not auto-open incident workflows	Checkbox	Unselected	If checked, incident workflows which are marked to auto-open will not auto-open for any member of this group
Viewer startup layout	List	None	If set, that layout will be loaded every time the user is logging in. Can be overwritten by equal property of Users. If no layout is defined, the last used layout will be loaded.

Name	Kind	Default Value	Comment
Dashboard: Selected Dashboard	Drop down list	None	The combo box shows all available dashboards. The dashboard for this user group can be selected here. The plus and minus buttons add or remove dashboards. See also Dashboard.
Dashboard: Name	Text	[Empty]	Assigns a dashboard to the user. Can be overwritten by equal property of Users.
Dashboard: URL	Link	unknown	A click- or selectable link to the dashboard. This will open the default browser application.
Rights	Checkbox	Unselected	Check for areas that users of this group should be able to access: • Live - see live cameras and device status within the Viewer • Playback - see playback from cameras and devices within the Viewer • Messenger - send or receive messages to or from other users within the Viewer • Reporting - access to reports within the Viewer • Manage incidents - re-assign and force finish incidents within the Viewer • Manage layouts - configure layouts within the Viewer • Manage placemarks - configure placemarks within the Viewer • Manage users - configure users and groups within the Configurator • Manage devices - configure devices within the Configurator
Access to Devices	List	None	Group users can have access or the access can be denied for devices within these lists.
Group Places	List	None	Placemarks that are accessible to all group users

Access to Devices

The access of these device types can be granted or denied by using white or black list features for each device type separately:

• Cameras

• Scripts

• IO devices

• Tracking devices

• POIs (Point Of Interests)

- Tours

- Actions

By selecting the type of the list, the marked device is either accessible or not. If the list is a white list, all devices marked are accessible and all unmarked devices are *not* accessible. If the list is a black list, all devices marked are *not* accessible and all other devices are accessible.
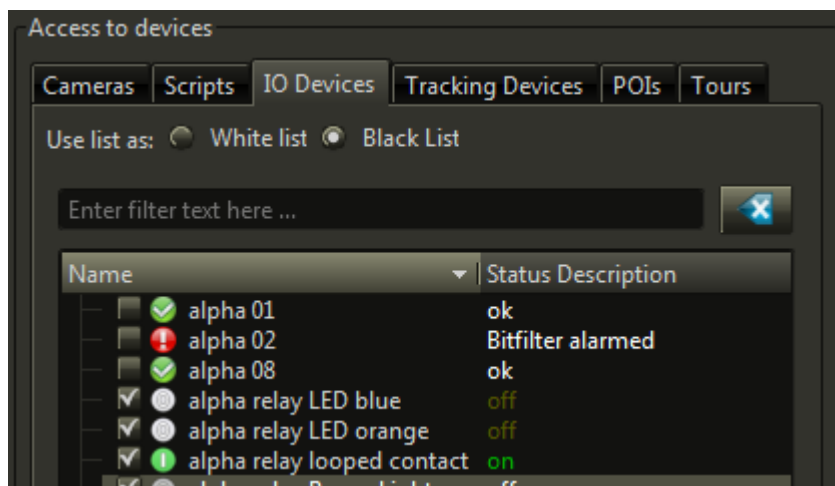
Device access list example

If a user is member of more than one user group, the list are added: If one user group denies the access to a device, the user cannot access this device even if another group grants access to this device.

Note: Changes in these lists will only have effect after restarting the Viewer application.

Contextual Menu

   Edit
   Objec Opens the selected object for setting it up
   t

4.4.2.1 Group Places

Configure places that are only visible to the user group.

New user group	User Group Places

Places

Global

Interception
Interception near east
Jeddah Airport to SE
Kuwait overview
Kuwait Sabriyah South
Las Vegas Convention Center
Las Vegas Drone
Las Vegas Honeywell East view
Las Vegas Honeywell Top view
Las Vegas Overview
Las Vegas Sands Expo
Las Vegas SE
Las Vegas Strip North view
Las Vegas Strip South view
Las Vegas Transformer
Munich Airport to NE

> >

< <

Group

Brussels Downtown
Doha Airport Concourse D-E
Earth
Friedrichshafen Office
Munich Center

4.4.3   Users

Configure the user accounts available in the system and assign them to user groups.

Name	Kind	Default Value	Comment
Password	Text	[Empty]	Login password for the user.
Authentication Code	Text	[Empty]	A one off code for identifying this user.
Reference Id	Text	[Empty]	Id if user references an external authentication server
Expires	Date/Time	01.01.2000 00:00:00	When the expire date is passed then the user account is blocked, except it is the default value, then the account never expires.
Viewer startup layout	List	None	If set, that layout will be loaded every time the user is logging in. Overwrites equal property of User Groups. If no layout is defined, the last used layout will be loaded.
Dashboard: Selected Dashboard	Drop down list	None	The combo box shows all available dashboards. The dashboard for this user can be selected here. The plus and minus buttons add or remove dashboards. See also Dashboard.
Dashboard: Name	Text	None	Assigns a dashboard to the user. Overwrites equal property of User Groups.
Dashboard: URL	Link	None	A click- or selectable link to the dashboard. This will open the default browser application.
Administrator	Checkbox	Unselected	Setup if the user will be an administrator. *Be careful:* An administrator has the right to access everything.
Groups: Member of	List of checkboxes	Unselected	Check the groups that the user will be a member of.

Home

Name	Kind	Default Value	Comment
Take view from map	Button		Updates current user home view to the view seen in GIS view
Set to map	Button		Sets current user home view to the GIS view

Name	Kind	Default Value	Comment
Reset	Button		Invalidates the current user home position

Tracking

Name	Kind	Default Value	Comment
Device	Drop down list	None	Select a device for tracking the user.
Filter	Drop down list	None	Select the filter of the tracking device. Some tracking devices need to have a filter.

If the current logged in user is the only user that has administrator rights, he cannot remove this right from his configuration. Also it is not possible to delete the last user with administration rights. If a setup gets corrupt and all users are gone, the system will create an user with administration rights with the user name 'Admin' and password 'Terra3D' automatically.

4.4.3.1 User Places

Configure places that are only visible to the current user.
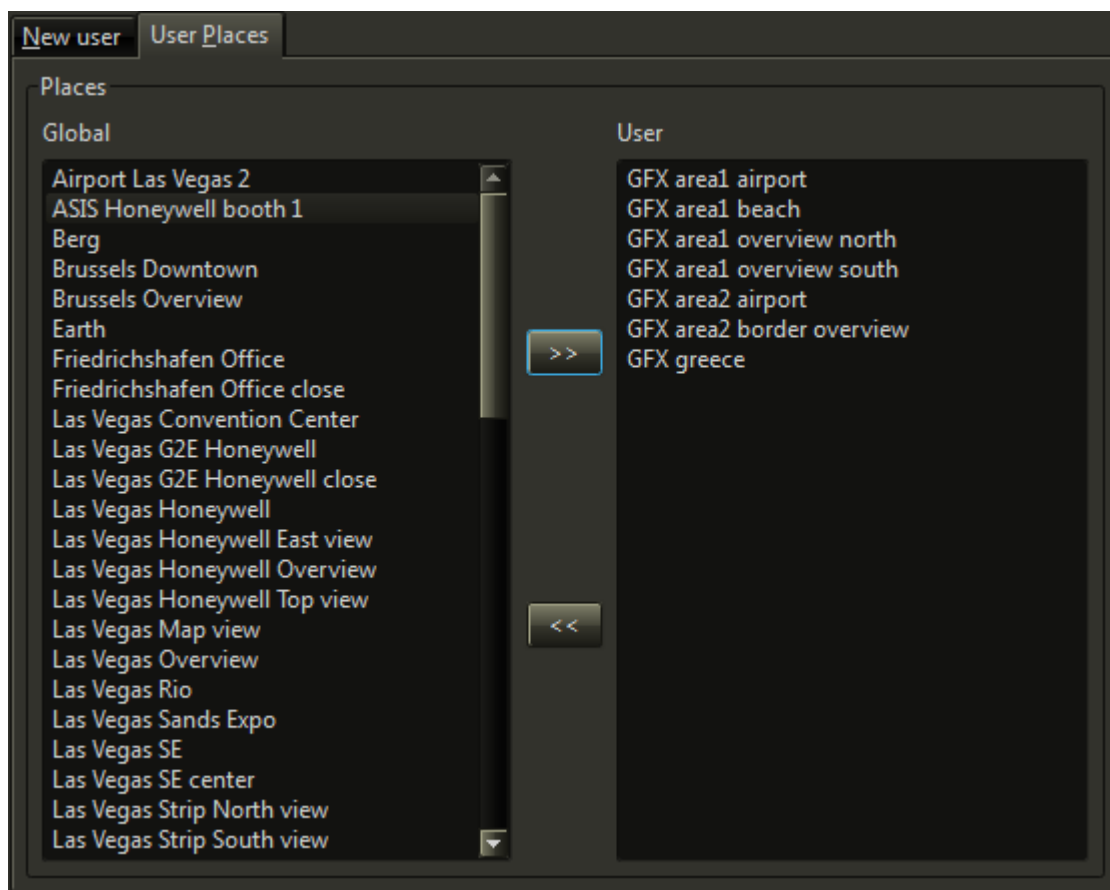
4.5   Site Properties

In TERRA 4D a site consists of <u>server</u> and <u>client</u> machines. Inside the Setup application it is defined what the specific machine will do. In this section all known machines are listed for a better overview of the site. Additionally some site specific <u>settings</u> can be changed.

4.5.1   Settings

Global

Name	Kind	Default Value	Comment
Number of incidents	Number	100	Number of latest (modification time) incidents fetched from the database into the live system on server startup.

Recording

TERRA 4D will record several system changes.

Name	Kind	Default Value	Comment
Do not overwrite old recordings	Checkbox	Unselected	If selected, the recording will be stopped if *'Free disk space'* is zero, or *'Used disk space'* is equal or greater than *'Reserved disk space'.*
Reserved disk space	Number	0 MB	Disk space reserved for recording. Old data will be overwritten if used space reaches this. *NOTE:* If set to zero [0 MB], all available space will be used.
Used disk space	Number	0 MB	The disk space used for recording. *NOTE: For information only*
Free disk space	Number	0 MB	The free disk space as reported from the operating system. *NOTE: For information only*

Database

Name	Kind	Default Value	Comment
Driver	Drop down list	SQLite	Select a database driver for the used database.
Name	Text	Terra3d	The database name.
Username	Text	[Empty]	User credentials for database.
Password	Text	[Empty]	User password for database.
Hostname	Text	[Empty]	Hostname of database server.

Name	Kind	Default Value	Comment
Port	Number	0	Port on which to connect to the database server.
Connection options	Text	[Empty]	Connection options to connect to the database.
Time to live	Number	30 days	Number of days the database entries will be kept.

Mail server

Name	Kind	Default Value	Comment
Address	Text	[Empty]	Hostname or IP address of the mail server.
Port	Text	25	Port number; The default port number for SMTP (unencrypted) is 25; SSL uses port 465, TLS uses port 587 as default.
Use TLS	Check box	Unselected	If checked a encrypted connection using TLS is used to send mails. Either TLS or SSL can be used.
Use SSL	Check box	Unselected	If checked a encrypted connection using SSL is used to send mails. Either TLS or SSL can be used.
Username	Text	[Empty]	Username to access the mail server. Can be empty if the mail server does not require any authentication.
Password	Text	[Empty]	Password for mail server access
Default sender address	Text	[Empty]	Uses the mail address as sender when no other sender address is configured.

4.5.1.1 Licenses

On this page all licenses are listed in three lists:
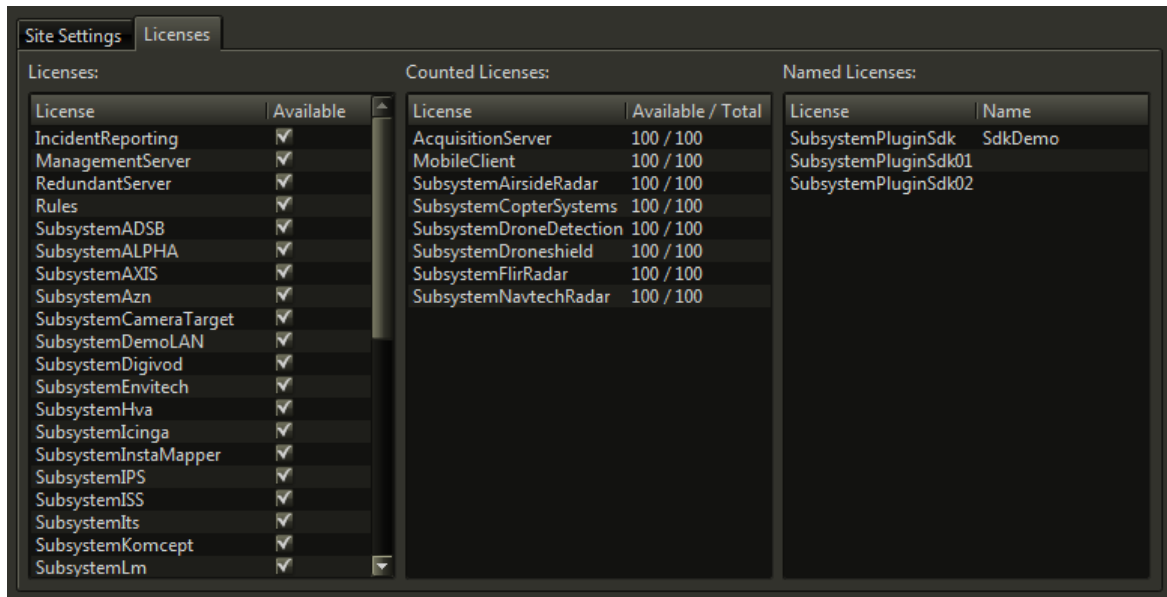
Licenses page

Licenses	Contains all non countable licenses which are just present or not, indicated by a check mark
Counted Licenses	Contains all counted licenses, indicated by a available / total license counter
Named Licenses	Contains all named licenses

NOTE: These list are for information only.

4.5.2 Clients

Name	Kind	Default Value	Comment
Hostname	Text	Information only	The hostname of the client machine as reported from the machine.

4.5.3 Servers

Name	Kind	Default Value	Comment
Hostname	Text	Information only	The hostname of the server machine as reported from the machine.
Type	Text	Information only	The type of server: • Master Server • Backup Server

Name	Kind	Default Value	Comment
			• Acquisition Server • Backup Acquisition Server
Server id	Text	Information only	The automatically given id of the server machine.
List of takeover devices	Text	Information only	On backup acquisition servers the takeover devices are listed here.
Last active	Text	Information only	The time of last activity of the server machine.

4.6   Third Party Settings

Here the properties for the third party settings are described.

4.6.1   Events

Add events to this device. This includes the common events described in <u>Events</u>.

4.6.2   Alpha

Alpha technology systems are Video Management Systems.

Following devices of alpha technology can be controlled from TERRA 4D:

- Cameras (live video and play back)
- Relay outputs
- Digital inputs

Name	Kind	Comment
Site IP Address	TCP IP Address	The IP Address of the Alpha server.
Site Id	Number	Site id of the Alpha site to be used. Only Objects from a single Alpha site can be used in TERRA 4D
Default ALPHA User name	Text	User name to access the alpha device
Default ALPHA Password 1-3	Text	For higher security it is possible to define up to 3 passwords at the Alpha system. You have to set so much passwords as required.
Playback time sync interval	Time	Interval to synchronize playback time between Terra4D and ALPHA

4.6.3   Axis

Axis is a company which builds cameras with an IO-Interface, for example

Name	Kind	Comment
User Name	Text	User name to access the device.
Password	Text	Password to access the device.
Server request interval	Time	Frequency of getting pictures from the camera.
Video request interval	Time	Interval to check video status.
Input poll interval	Time	Interval to check state of input device.
Output poll interval	Time	Interval to check state of output device.
Ptz poll interval	Time	Interval to get the actual position of the camera if not moved from this operator.
VlcBufferTime	Time	Buffer time setting for VLC.

4.6.4   HVA

Honeywell Video Analytics (HVA) is suite of a video analytics.

Name	Kind	Comment
Host name or IP address	Text	Name or IP address of the HVA host.
IP port	Number	Port of the device.
HVA user name	Text	User name to access the system.
HVA password	Text	Password to access the system.
HVA tcp log file	Text	Log all TCP communication from HVA to this log file.
FpsLimitSensor	Number	
FpsLimitVideo	Number	

4.6.5   ISS

A Video Management System with a facial recognition capability.

Name	Kind	Comment
Host name	Text	The name of the ISS host
Iidk port	Number	Port of the VMS
Iidk id	Number	Id of the VMS
Iidk receiver id	Number	Id of the VMS receiver
Facial recognition path	File path	If a person is recognized the picture will copied to the path.
VlcBufferTime	Time	Buffer time setting for VLC.

4.6.6   Komcept

Komcept offers a service to locate and record phone calls.

Name	Kind	Comment
IP Address	TCP IP Address	The IP Adress of the Komcept device.
Port	Number	The Port to access the device.
LogFile	Text	
LookupUser	Text	
LookupPassword	Text	
LookupUrl	Text	

4.6.7   Honeywell MaxPro

MaxPro offers video camera systems.

Name	Kind	Comment
HostName	Text	The name of the MaxPro host
Port	Number	The port of the MaxPro service, default 26026
MaxProStationId	Number	The identifier with which Terra4D is registered within the MaxPro server
MAXPRO user name	Text	Username to connect with MaxPro server
MAXPRO password	Text	Password to connect with MaxPro server

4.6.8 SipGate

SipGate is a company which offers a web service, besides many others, to send SMS. This could be used in scripts and if you assign them to actions, the operator can create this from his desktop. The device has these properties:

Name	Kind	Comment
User name	Text	The user name to login at the sipgate server
Password	Text	The password to login at the sipgate server

4.7 Dashboard

The dashboard provides a high-level overview of the overall system state, e.g. device status, incident statistics. The dashboard can be opened by using a URL in a web browser:

- Dashboard called on the same system as server: http://localhost:18304/dashboard/index.htm

- Dashboard using a remote server: http://<server address>:18304/dashboard/index.htm

After calling the URL the user needs to log on to the dashboard. The same user credentials are valid here as for the stadard client application log in.

The configuration of the dashboard content is also done in the web browser. Only the user specific dashboards need to be set in Configurator, see also User Groups and Users.

4.7.1 Layout

This section describes the configuration of the general layout of the dashboard using tabs and panes. On first start there's an empty "Default" dashboard. More tabs can be added by clicking "+ ADD TAB".

A click on tool button opens the configuration pane which enables editing of tabs and panes. At every item is another tool button to edit the name of tabs and the title and size of panes. After modifications the changes need to be saved manually by clicking on "SAVE CHANGES".

4.7.2 Pane Content

This section explains how to modify widgets. The widgets represent the pane content.

Before creating any widgets data sources need to be set up. Currently data sources have to be selected for each tab page separately. A click on "ADD" in the data sources section start the creation of new data source. Following types are available:

Name	Parameters	Description	Supported widgets
Histogram	• Refresh time (seconds) • Duration of a single interval (1h, 1d, 10d) • Number of intervals • Queries (optional parameters)	Histogram over the configured time interval.	• Bars • Line graph • Donut • Stacked bars • Table
List	• Refresh time (seconds) • Maximum list length	List of objects. Currently provides the following data:	• Bars • Donut

Name	Parameters	Description	Supported widgets
	• Queries (optional parameters)	• Incident types • Incidents • Objects • Resources • Incident status	• Table
Status	• Refresh time (seconds) • Maximum item count • Queries (optional parameters)	Status of objects. Currently supports the following types: • Cameras • Objects • IO devices • Resources	• Bars • Donut • Table • Gauge

A click on the button ➕ opens a dialog with a selection box for different types of dashboard widgets: bars, gauge, linegraph, pie/donut, stacked bar, table.

After selecting one of those widgets the dialog will display the relevant widget settings including the data source.

The tool button 🔧 which appears when moving the mouse over the widget can be used to edit the widget settings.

The following table shows the widget types and data sources and how these can be combined.

Widget Description	Datasource type (configured at DATASOURCES)	Name of ... (configured at DATASOURCES, overwritten by widget value)	Type (configured at WIDGET)	Value (configured at WIDGET)
Table of Incidents	Terra4D List	incidents	Terra4D Table	datasources["<datasource name>"]["Incidents"]
Bar graph of number of incident types	Terra4D List	incidents	Terra4D Bars	datasources["<datasource name>"]["IncidentTypes"]
Bar graph of incidents per interval	Terra4D Histogram	alarms	Terra4D Bars	datasources["<datasource name>"]["Created"]
Line graph of created and finished incidents per interval	Terra4D Histogram	alarms	Terra4D LineGraph	datasources["<datasource name>"]
Donut of number of incidents types	Terra4D List	incidents	Terra4D Pie/Donut	datasources["<datasource name>"]["IncidentTypes"]
Donut of camera status	Terra4D Status	cameras	Terra4D Pie/	datasources["<datasource name>"]["cameras"]

Widget Description	Datasource type (configured at DATASOURCES)	Name of ... (configured at DATASOURCES, overwritten by widget value)	Type (configured at WIDGET)	Value (configured at WIDGET)
			Donut	
Donut of resource status	Terra4D Status	cameras	Terra4D Pie/ Donut	datasources["<datasource name>"] ["resources"]
Table of objects	Terra4D List	objects	Terra4D Table	datasources["<datasource name>"] ["Objects"]

After modifications the changes need to be saved manually by clicking on "SAVE CHANGES".

5 Procedures

This section describes how to configure specific scenarios. It can be used as a guide line to configure the devices in the right order.

Camera

5.1 General Configuration Order

This section provides a general guideline in which order the TERRA 4D system should be configured to avoid inefficiencies caused by device and setting dependencies.

Step A - Basic settings (GIS, Avatars, Subsystem interfacing)

1. Layer Groups
   This is the basic 3D GIS model configuration. The GIS is needed to place newly created devices at the right location.

2. Indoor Entities
   If the project includes indoor areas the configuration of 3D GIS model will be continued by setting up the vicinities, buildings, floors and rooms.
   Configuration of Polygon Types might be required for visualization of vicinities.

3. Avatars
   There are default avatar devices which can be used but if specific avatars are required it makes sense to define these in this early stage.

4. Third Party Settings
   These settings define basic parameters of the subsystems connected to TERRA 4D.

Step B - Device settings

1. Cameras
   The camera set up involves a couple of other device types. Some of the listed device types are optional dependent on the current configuration, e.g. control ports, actions, categories.

   Configuration order (fixed camera): Fixed Cameras ⟷ Camera Optics → Actions →

   Categories → Fixed Cameras → Camera Sensors

   Configuration order (PTZ camera): Control Ports → PTZ Cameras ⟷ PTZ Camera Optics →

   Actions → Categories → PTZ Cameras → Camera Sensors

2. IO Devices
   IO devices are used for many types of subsystems, like digital alarm inputs of cameras, relay outputs, access control and building management data points.

   Configuration order: IO Devices ⟷ Actions → Event Handlers → Status Visualization

3. Tracking Devices
   Tracking devices generate tracked objects which appear as objects in Viewer application. Different types of technologies are used to get object positions, like GPS tracker, AIS (ships) and ADS-B (aircrafts) transponder signals.

4. Radar Devices
   Radar devices detect objects which appear in Viewer application. The radar configuration allows settings to visualize the field of view and type of radar (fix/rotating).

5. Communication devices
   Communication Devices are used to show position of and to listen to communications.

   Configuration order: Communication Display Types → Communication Devices

6. Zones
   Geofencing can be realized using virtual zones. Zones can trigger events when an object enters

or leaves the zone. In addition zones and objects in zones can be combined using rules.

Configuration order: <u>Polygon Types</u> → <u>Zones</u>

7. Timer, Schedules
Timers and schedules are typically used to trigger actions. Utilizing schedules for example a day/ night or weekday/weekend operation can be realized by arming/disarming sensors and zones.

Configuration order: <u>Timer</u> → <u>Schedules</u> → <u>Event Handlers</u>

Step C - Event and alarm handling

1. Users
User Management is not only important for alarm handling but also for log on into applications and rights in applications (user roles).

Configuration order: <u>User Groups</u> → <u>Users</u>

2. Alarm processing
Alarm processing normally involves also switching to alarm layouts in the Viewer application. Please prepare the alarm layouts there before configuring the alarm processing.

Configuration order: <u>Script Engine</u> → <u>Incident Types</u> → <u>Event Handlers</u>

If rules are used add: <u>Rules</u> → <u>Event Handlers</u>

Step D - Miscellaneous

1. <u>Categories</u>
Configure categories to create logical groups to order devices e.g. in tree views. Every device can be assigned to one or many categories.

2. <u>Points Of Interest</u>
Configure points of interest to fly to the location in the 3D GIS view, to show an overlay icon on top of an video image or to attach documents and other actions to specific locations.

3. <u>Places Global</u>
Configure placemarks to fly to important locations in the 3D GIS view.

4. <u>Tours</u>
Configure tours to fly around the building or perimeter in the 3D GIS view (virtual guard tour).

5.2   Specific Configuration Scenarios

This section lists a couple of procedures for device configuration. If the requested device type is not listed the procedure of a similar type can be used.

Specific examples

- access control door (3rd party system, io device, camera)
- perimeter (3rd party, io device, camera, camera sensor, ptz camera, zone)
- alarm management (event handler, incident type, script, …)
- schedule day/night operation
- camera tracking

Cameras - Fixed

Camera Fixed ↔ Camera Optic → Action → Category → Camera Fixed → Camera Sensor

Device	Property	Comment
Create new "Camera - Fixed"	Tab General, Tab Visualisation	
Create new "Camera Optics - Fixed"	Tab General Tab Distortion	
"Camera - Fixed"	Tab General / Optics	
"Camera - Fixed"	Tab Calibration	

Cameras - PTZ

6 Appendix

The appendix contains some additional information.

6.1 Imprint and Addresses

Imprint

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6.2   Glossary

DEM	Digital elevation model. Elevation data without buildings and vegetation.
Device	All kinds of security-relevant items, configured and operating in the system
DSM	Digital surface model. Contains elevation data including buildings and vegetation.
GIS	Geographic Information System. The GIS view displays information in an exact geographical position.
GPS	Global Positioning System. Its coordinates are used to locate an item and navigate to it.
PTZ	Pan Tilt Zoom. A set of camera moving options.

7   default empty

[Empty]

Index

3

A

B

C

D