Veronte Ops

Release 6.8

Embention

2023-10-04

CONTENTS

Veronte Ops is the application employed to operate Veronte Autopilots.

CHAPTER

ONE

QUICK START

Veronte Ops is a **website application** for the operation and monitoring of the vehicle during the mission.

Veronte Ops includes:

- **Telecommand**: Support for all synchronous operator control commands that can be sent to the flight segment, e.g. operational mode switch, mission management, payload control.
- **Mission design**: Configuration of user-defined, pre-defined mapping and launch missions, as well as in-flight mission editing.
- **Operation parameters**: Configuration of operation parameters, such as theirs values, positions and directions, which may vary depending on the mission and during the mission.
- **Workspace**: User can get feedback on autopilot variables and status through widgets.
- **Multiple users**: One or more operators can work simultaneously.

1.1 System requirements

Before executing this software, users should check the following sections with the minimum and recommended PC hardware requirements.

1.1.1 Minimum

- **CPU**: Intel Core i5-8365UE
- **RAM**: 8 GB DDR4
- **STO**: 256 GB SSD

1.1.2 Recommended

- **CPU**: Intel Core i5-1235U (10C/DecaCore 1.3 / 4.4GHz, 10MB)
- **RAM**: 8 GB DDR4
- **STO**: 512 GB SSD M.2 NVMe PCIe

1.2 Compatible browsers

The following are the functional, optional and unsupported browsers for used with **Veronte Ops** software:

Functional

- **Google Chrome**: version 85 Q2 2020
- **Edge (Chromium)**: Q1 2020

Optional

- **Opera (Chromium)**: latest
- **Safari**: version 12

Unsupported

- **Edge not based on Chromium**
- **Firefox**

1.3 First Steps

- To access this application simply click on the following link: https://v68-vapp.embention.net/
- Users can work with it from the **browser** or **download** it to the PC.
  - **Browser**

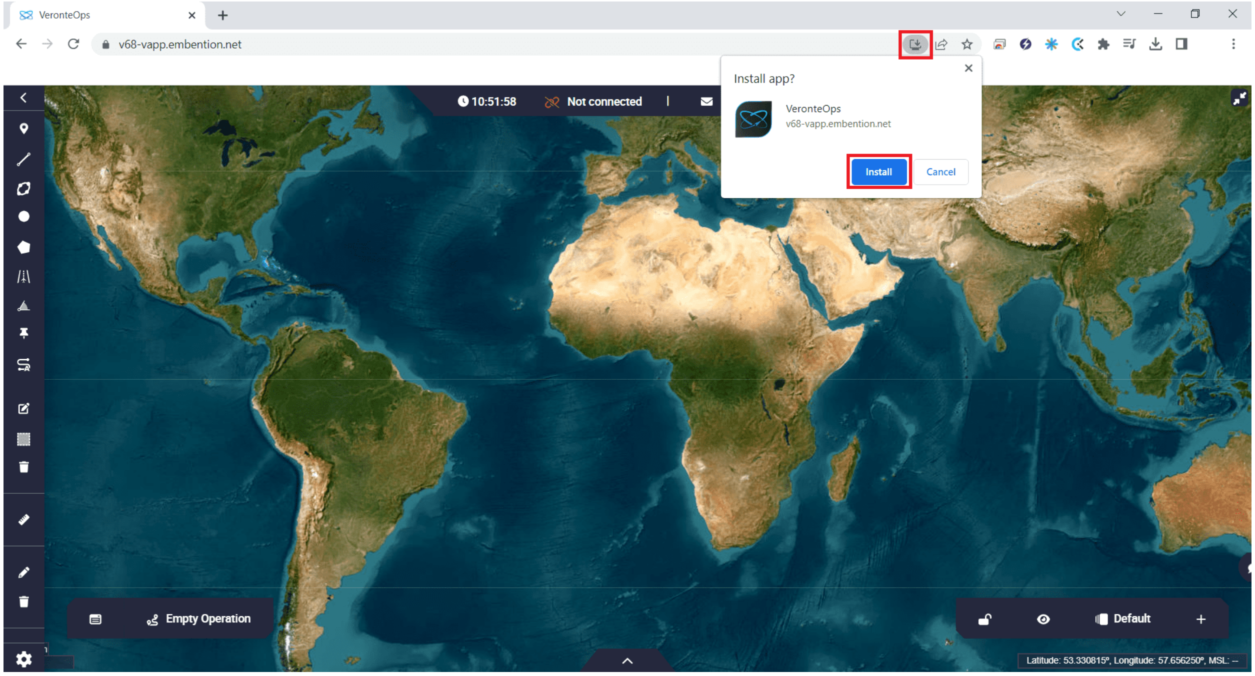


Fig. 1: **Download Veronte Ops**

  - **Installed in PC**

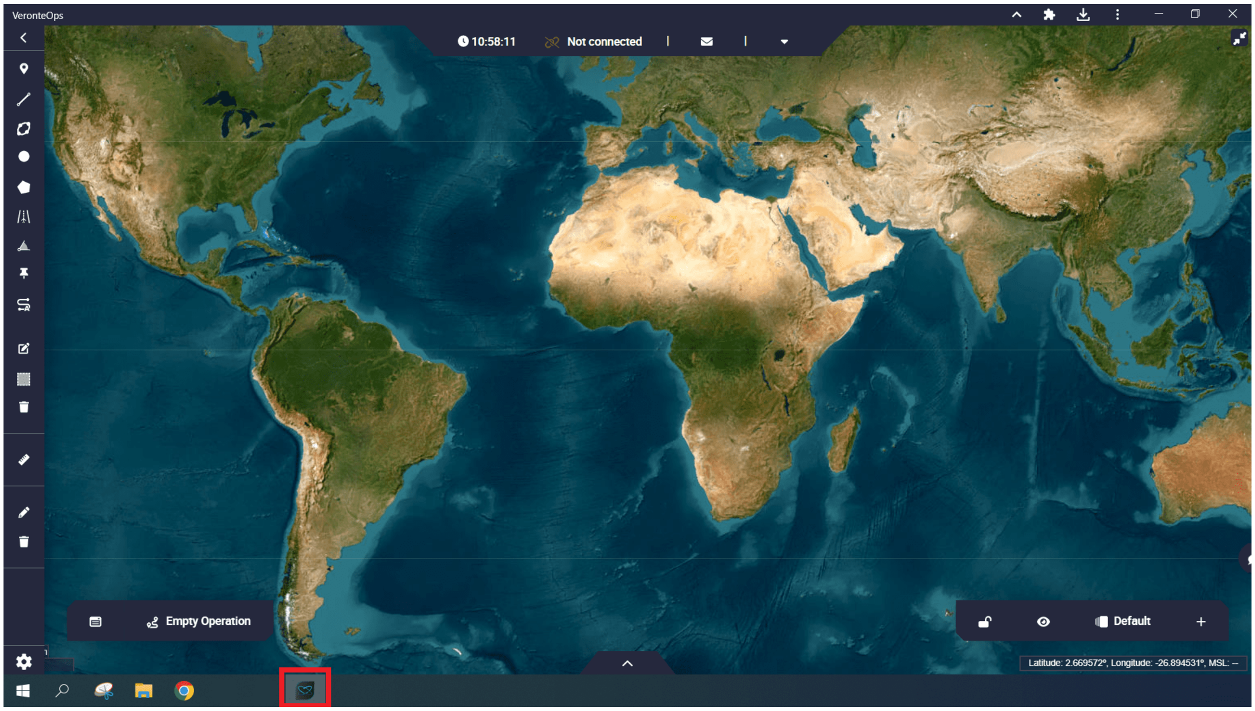


Fig. 2: **Veronte Ops in PC**

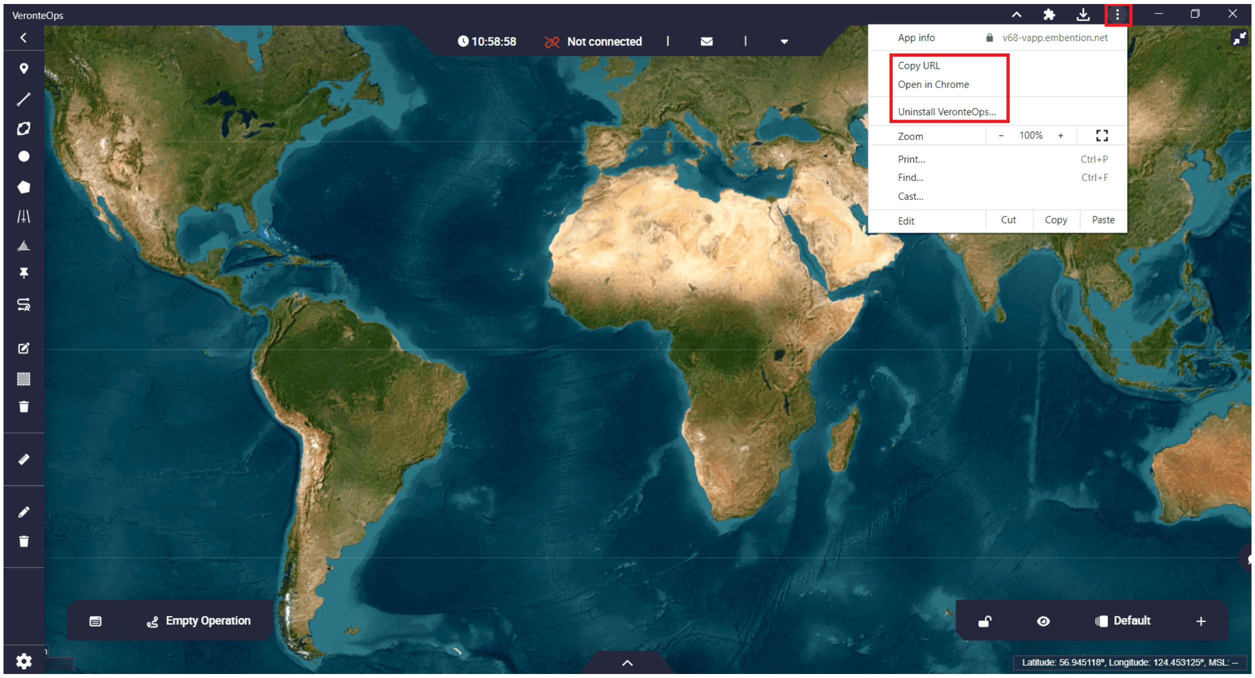


Fig. 3: **Uninstall/Open in browse Veronte Ops**

- As it is a web application, **updates** will be done on their own and will appear as a **changelog** in the application.

CHAPTER TWO

ADDITIONAL APPS

2.1 Veronte Terrain Provider

Fig. 1: **Veronte Terrain Provider**

Veronte Terrain Provider is an additional application that provides SRTM terrain data to Veronte Ops.

Thanks to this, Veronte Ops allows the user to visualize terrain heights on the created route. This makes it possible to foresee possible collisions of the aircraft with the terrain along the route.

2.1.1 Download

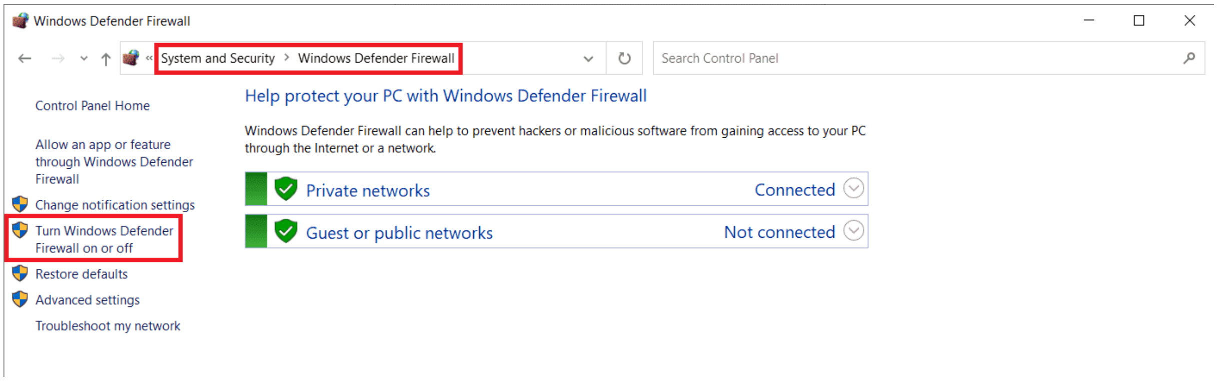
Once the **Veronte Autopilot 1x** has been purchased, a GitHub release should be created for the customer with the application.

To access to the release and download the software, read the Releases section of the **Joint Collaboration Framework** user manual.

2.1.2 Installation

To install Veronte Terrain Provider on Windows just execute “VeronteTerrainProvider.exe” and follow the indications of the setup wizard.

> **Warning:** If users have any problems with the installation, please disable the antivirus and the Windows firewall. Disabling the antivirus depends on the antivirus software.
>
> To disable the firewall, go to “Control Panel” → “System and Security” → “Windows Defender Firewall” and then, click on “Turn windows Defender Firewall on or off”.



Windows Defender Firewall

System and Security > Windows Defender Firewall

Search Control Panel

Control Panel Home

Allow an app or feature through Windows Defender Firewall

Change notification settings

Turn Windows Defender Firewall on or off

Restore defaults

Advanced settings

Troubleshoot my network

Help protect your PC with Windows Defender Firewall

Windows Defender Firewall can help to prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

Private networks	Connected
Guest or public networks	Not connected

Fig. 2: **Windows Defender Firewall**

2.1.3 Configuration

It is possible to import external hgt files, which contain terrain information, and use them for mission preparations. These files follow the SRTM (Shuttle Radar Topography Mission) standard, with 3 arc-seconds (approximately 90 meters) of resolution. To import one of them, simply copy it into the directory:

`C:\Users\` user `\AppData\Roaming\VeronteTerrainProvider\terrainprovider`

Each hgt contains terrain information about one area of the world. The following image shows how these areas are distibuted, so each cell corresponds to one hgt:

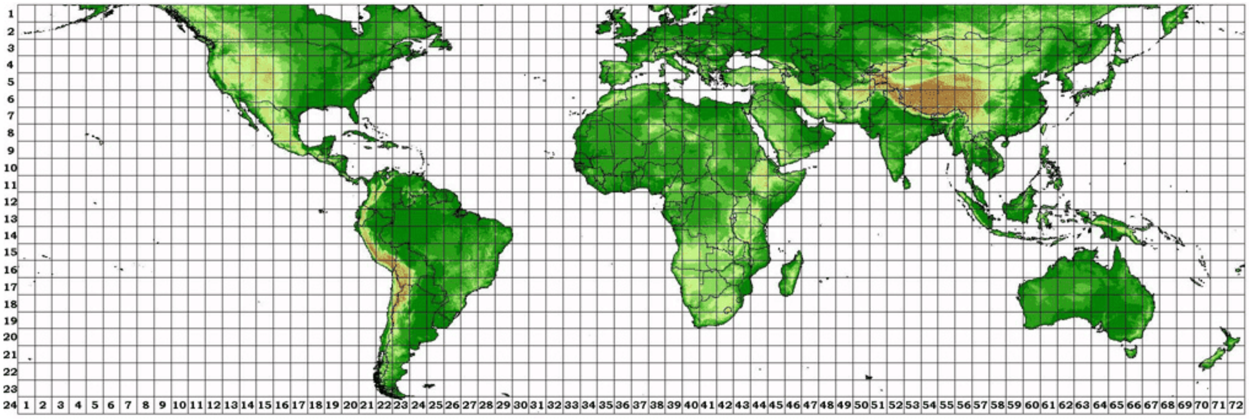


Fig. 3: **Terrain information distribution**

2.1.4 Operation

Once installed, users just need to run it. When it runs, it will always remain open in the background, which users can check in the PC's Windows taskbar.

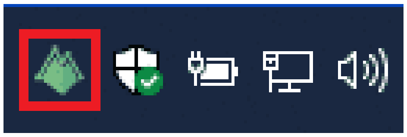


Fig. 4: **Veronte Terrain Provider in task bar**

It is **only necessary to run it the first time it is used**, then it should **always remain open** so that when the computer is switched on, it starts up as well.

Note: If users close it, i.e. remove it from the taskbar, just run it again to start it.

2.2 Web Converter

Fig. 5: **Web Converter**

Web Converter is a tool able to receive video in RTSP and serve it in webRTC and/or receive udp messages and send them via websocket.

Veronte Ops needs this application to **visualize video** and to work with **udp content** after it has been converted to websocket.

Therefore, it must be used when working with **gimbals** to visualize their video and click on them to send the **tracking command** to an object.

2.2.1 Download

Once **Veronte Autopilot 1x** has been purchased, a GitHub release should be created for the customer with the application.

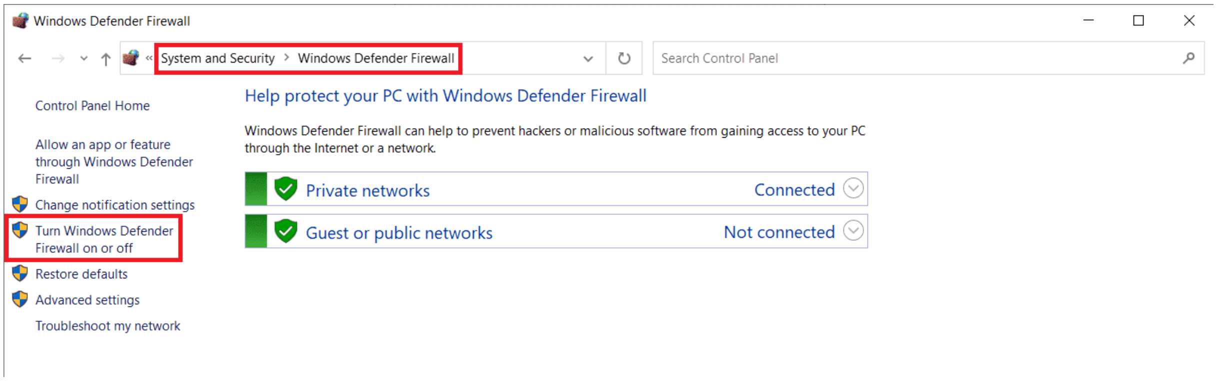
To access to the release and download the software, read the Releases section of the **Joint Collaboration Framework** user manual.

2.2.2 Installation

To install **Web Converter** on Windows just execute "WebConverter.msi" and follow the indications of the setup wizard.

Warning: If users have any problems with the installation, please disable the antivirus and the Windows firewall. Disabling the antivirus depends on the antivirus software.

To disable the firewall, go to "Control Panel" → "System and Security" → "Windows Defender Firewall" and then, click on "Turn windows Defender Firewall on or off".



Windows Defender Firewall

System and Security > Windows Defender Firewall

Search Control Panel

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Restore defaults

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Help protect your PC with Windows Defender Firewall

Windows Defender Firewall can help to prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

Private networks Connected

Guest or public networks Not connected

Fig. 6: **Windows Defender Firewall**

2.2.3 Configuration

Once the **Web Converter** software is downloaded and installed, configure it.

The configuration of this application is simply a `config.json` file with parameters for video display and command that need to be modified:

```
{
  "server": {
    "http_port": ":8083",
    "ice_servers": ["stun:stun.l.google.com:19302"]
  },
  "streams": {
    "veronte_Gimbal_Camera": {
      "on_demand": false,
      "url": "rtsp://192.168.8.94/net0"
    }
  },
  "udp_config": {
    "ip": "192.168.8.94",
    "port": 14003,
    "websocket_url": "localhost",
    "websocket_port": "1997"
  }
}
```

- `server` Users can modified the localhost port (*http_port*).

  The generated URL will look like this: `http://localhost"http_port"`

- `streams` Parameters to modify to **view the video recording** of the desired camera in **Veronte Ops**
  - `"camera name"`: Is to identify the gimbal camera. By default *veronte_Gimbal_Camera* is set.

    As the user can enter as many cameras to display the video as desired, each gimbal camera is configured here:

    - **url**: URL of the gimbal video. This is just an example, the URL (rtsp) depends on the user's gimbal.

- `udp_config` To **command** from **Veronte Ops** to the gimbal. Set the following parameters:
  - **ip**: **IP address** configured as the udp connection of the camera.
  - **port**: **Port** configured as the udp connection of the camera.
  - **websocket_url**: Websocket URL to which users want to send the converted udp messages.
  - **websocket_port**: Websocket port to which users want to send the converted udp messages.

Note: Even if users only want to view the video recording in **Veronte Ops**, they can leave the default configuration parameters of **upd_config**, as they do not affect the video configuration.

However, they can also remove these lines from the configuration if they wish.

2.2.4 Operation

Once the **Web Converter** application has been configured according to the user's needs, follow the steps below to work with:

1. Just run the application and **always keep it open**.
2. Copy the link generated by the tool into the corresponding **Veronte Ops** configuration:
   - For **video recording**, copy the URL generated into the *Iframe widget*.

     For example, with the default **http_port**, the URL generated will be: `http://localhost:8083`.
   - For **command**, the user must copy the **websocket_url** and **websocket_port** previously configured into the **URL** and **Port** fields, respectively, of the **WebSocket** connection configuration of the *Gimbal panel*.

CHAPTER
THREE

PANELS

Panels on Veronte Ops are distributed as shown in the following figure:

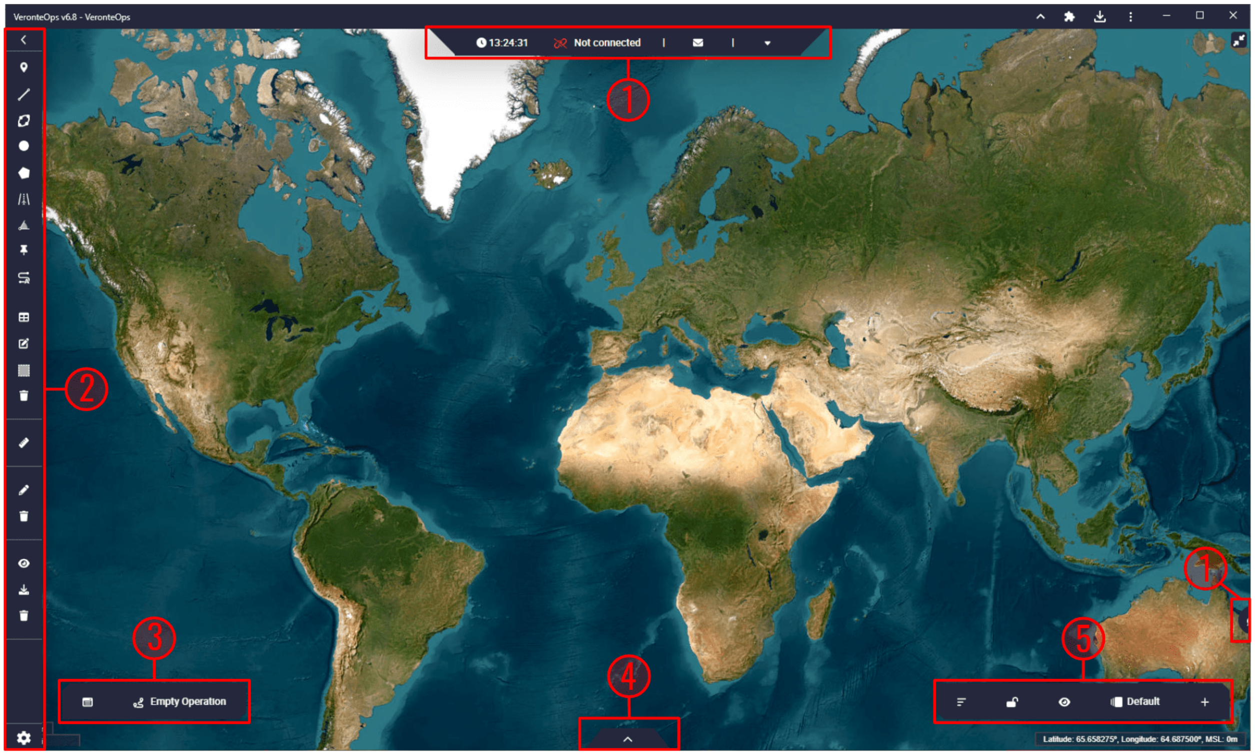

VeronteOps v6.8 - VeronteOps
13:24:31
Not connected
1
2
3
4
5
1
Empty Operation
Default
Latitude: 65.658275°, Longitude: 64.687500°, MSL: 0m

Fig. 1: **Veronte Ops panels**

1. *Veronte Ops configuration*: Edit Veronte Ops settings.
2. *Mission*: Create and edit **missions**.
3. *Operation*: Edit **operations** defined in 1x PDI Builder and perform **calibrations**.
4. *Platform*: Veronte Autopilot information.
5. *Workspace*: Customize everything related to the Veronte Ops workspace, such as telemetry (widgets), map and workspace settings.

These panels are described in detail in the following sections.

3.1 Veronte Ops configuration

This section describes all the menus, options and actions that allow the user to **modify the configuration and appearance** of this application. These are:

- *Status bar*
- *Feedback menu*
- *Background configuration*
- *Platform icon*

3.1.1 Status bar

In the status bar, the user can view mission and operation relevant information, as well as modify general Veronte Ops settings.

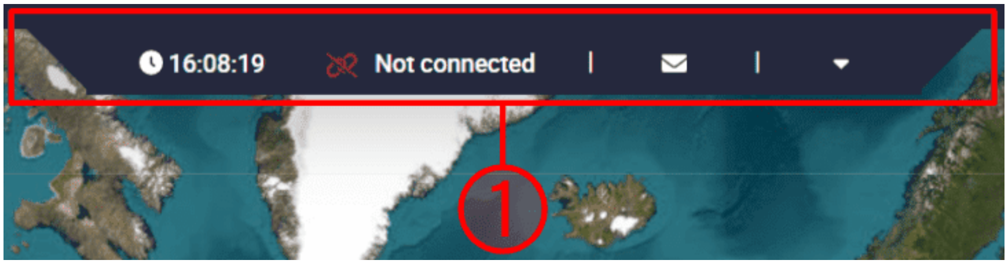


Fig. 2: **Status bar**

This bar is divided into 3 'parts':

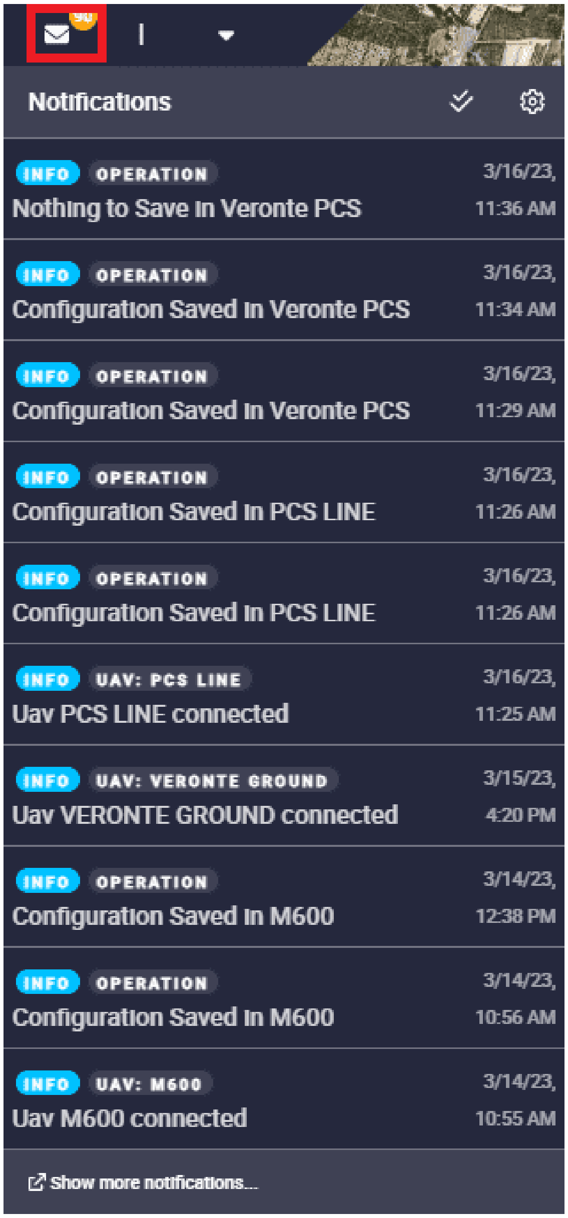
- Status bar items: **Clock**, **Weather** and **Platform selected** information items are grouped here.

  The user can choose to show/hide each of these elements from the *Status bar settings*.

  By default, the clock and the selected platform are shown, as can be seen in the image above.
- *Notifications*: Veronte Ops notifications for users. This is always displayed in the status bar.
- *More options*: By clicking on this drop-down menu, users will find options for configuring this application and its appearance.

3.1.1.1 Notifications

Veronte Ops will notify the user of any changes made with notifications (visual and audible, the latter is optional), as shown in the figure below:



INFO OPERATION Nothing to Save in Veronte PCS 3/16/23, 11:36 AM

INFO OPERATION Configuration Saved in Veronte PCS 3/16/23, 11:34 AM

INFO OPERATION Configuration Saved in Veronte PCS 3/16/23, 11:29 AM

INFO OPERATION Configuration Saved in PCS LINE 3/16/23, 11:26 AM

INFO OPERATION Configuration Saved in PCS LINE 3/16/23, 11:26 AM

INFO UAV: PCS LINE Uav PCS LINE connected 3/16/23, 11:25 AM

INFO UAV: VERONTE GROUND Uav VERONTE GROUND connected 3/15/23, 4:20 PM

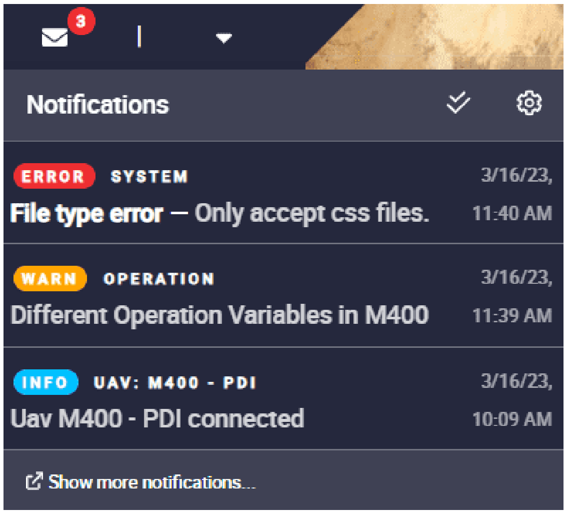
INFO OPERATION Configuration Saved in M600 3/14/23, 12:38 PM

INFO OPERATION Configuration Saved in M600 3/14/23, 10:56 AM

INFO UAV: M600 Uav M600 connected 3/14/23, 10:55 AM

Fig. 3: **Notifications menu**

In addition, notifications are classified into 3 groups (**Information**, **Warning** and **Error**) with a colour code (**blue**, **orange** and **red** respectively):



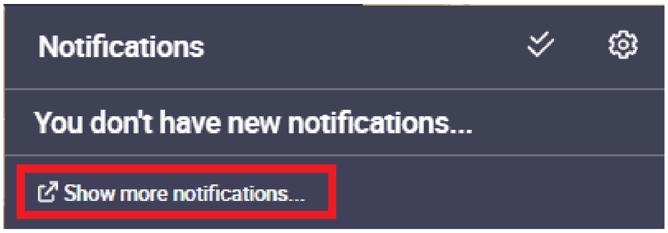
ERROR SYSTEM 3/16/23, 11:40 AM
File type error — Only accept css files.

WARN OPERATION 3/16/23, 11:39 AM
Different Operation Variables in M400

INFO UAV: M400 - PDI 3/16/23, 10:09 AM
Uav M400 - PDI connected

Fig. 4: **Notifications menu - Classification**

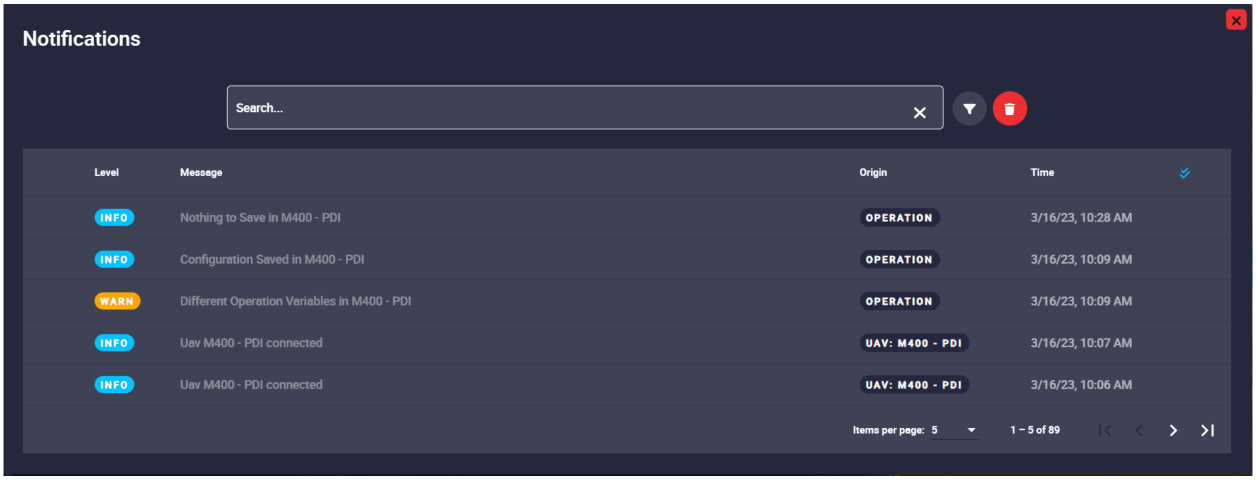
These notifications can be **marked as read** by clicking on the ✓ icon at the top of this menu. So, they will no longer be displayed in this menu.



You don't have new notifications...

Fig. 5: **Notifications readed**

However, if the user wishes to consult them, simply clik on '**Show more notification…**' and a new window will appear with the entire history of notifications. Here the user can search for notifications or delete them:



Level	Message	Origin	Time
INFO	Nothing to Save in M400 - PDI	OPERATION	3/16/23, 10:28 AM
INFO	Configuration Saved in M400 - PDI	OPERATION	3/16/23, 10:09 AM
WARN	Different Operation Variables in M400 - PDI	OPERATION	3/16/23, 10:09 AM
INFO	Uav M400 - PDI connected	UAV: M400 - PDI	3/16/23, 10:07 AM
INFO	Uav M400 - PDI connected	UAV: M400 - PDI	3/16/23, 10:06 AM

Fig. 6: **History of notifications**

Besides, in the notification configuration users can choose, to some degree, which groups of notifications are shown or not. This is to a certain degree because, as the classification described above has been defined according to importance, **error notifications will always be shown** (as they are the most important ones) but warning and information notifications can be chosen to be seen/heard or not.

To access it, simply click on the ⚙ icon at the top of this menu:

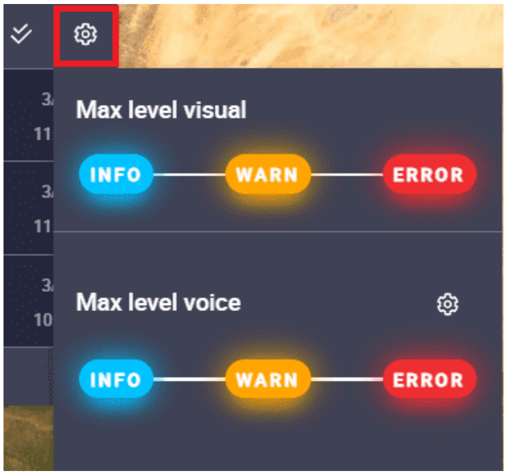
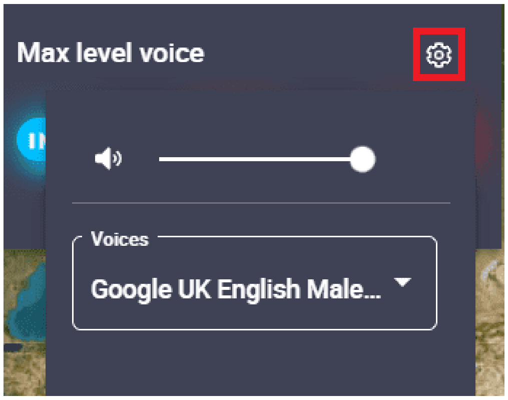


Fig. 7: **Notifications menu - Configuration**

Besides, the user can also choose the language of the sound notifications by clicking on the settings icon:



Voices: Google UK English Male...

Fig. 8: **Sound notifications language**

Below is an example of how to customize the notification settings:

Fig. 9: **Modified notifications**

3.1.1.2 More options

Moreover, by clicking on the drop-down menu on the right, users will find more options, such as:

- *Changelog*
- *Light/Dark mode*
- *Status bar settings*
- *Setup*
- *Terms and Conditions*

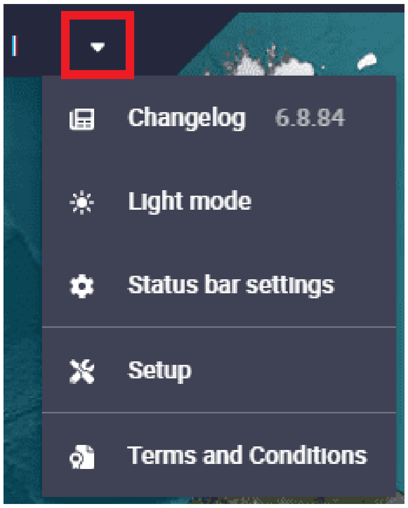
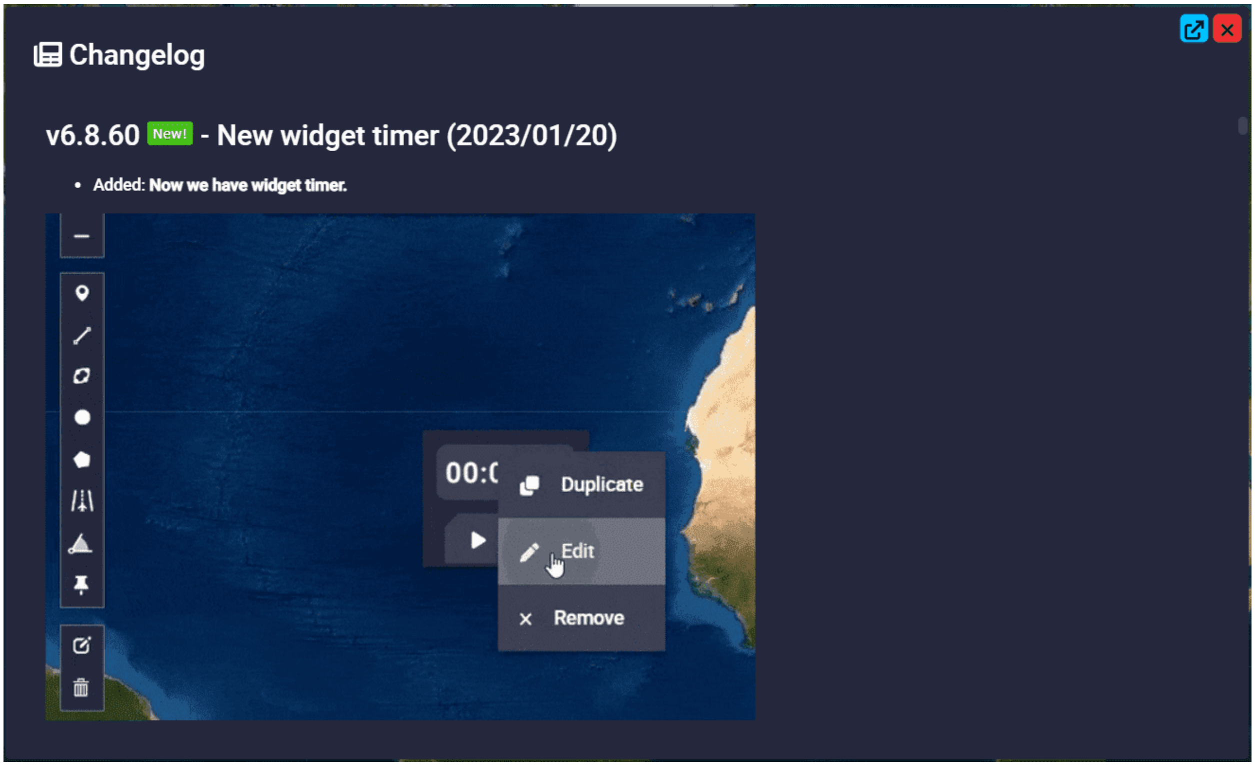


Fig. 10: **Drop-down menu**

3.1.1.2.1 Changelog

Users can consult the changelog, which shows all updates made to the application.



Changelog

v6.8.60 New! - New widget timer (2023/01/20)

- Added: Now we have widget timer.

Fig. 11: **Changelog**

3.1.1.2.2 Light/Dark mode

Change the interface display mode: Light/Dark mode.

Fig. 12: **Light/Dark mode**

3.1.1.2.3 Status bar settings

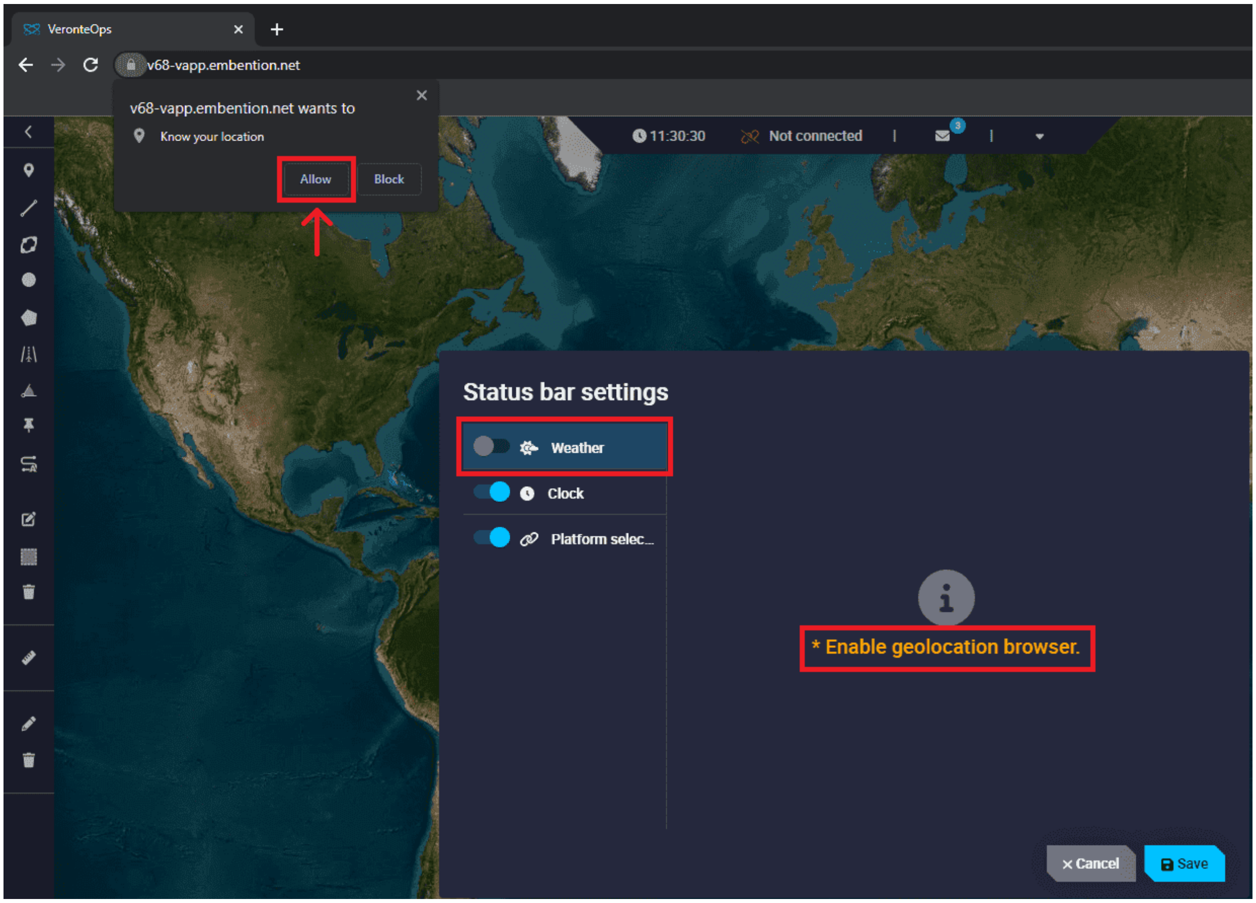
This menu allows the user to **enable/disable** the information items in the status bar.

Note: To save any changes, click the "Save" button in the bottom right corner of the menu.

- **Weather**

  This option will only be **available** if the user has **geolocation enabled**, i.e. the browser has permissions to use the user's geolocation.

  In order to do this:



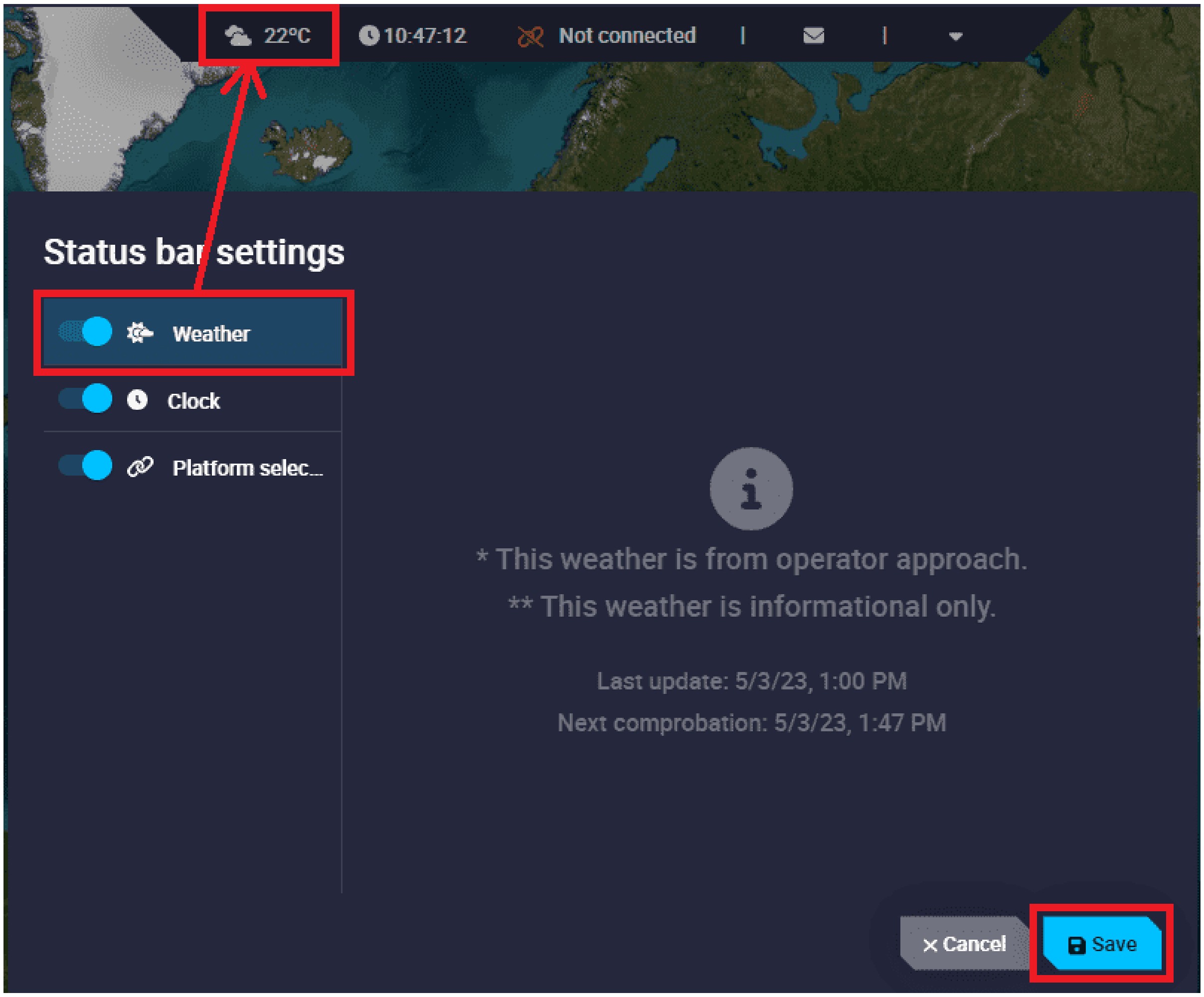
v68-vapp.embention.net wants to

Know your location

Status bar settings

* Enable geolocation browser.

Fig. 13: **Weather section - Enable geolocation**



* This weather is from operator approach.
** This weather is informational only.

Last update: 5/3/23, 1:00 PM
Next comprobation: 5/3/23, 1:47 PM

Fig. 14: **Weather section**

- **Clock**

  It is possible to customize the timezone where users are working.

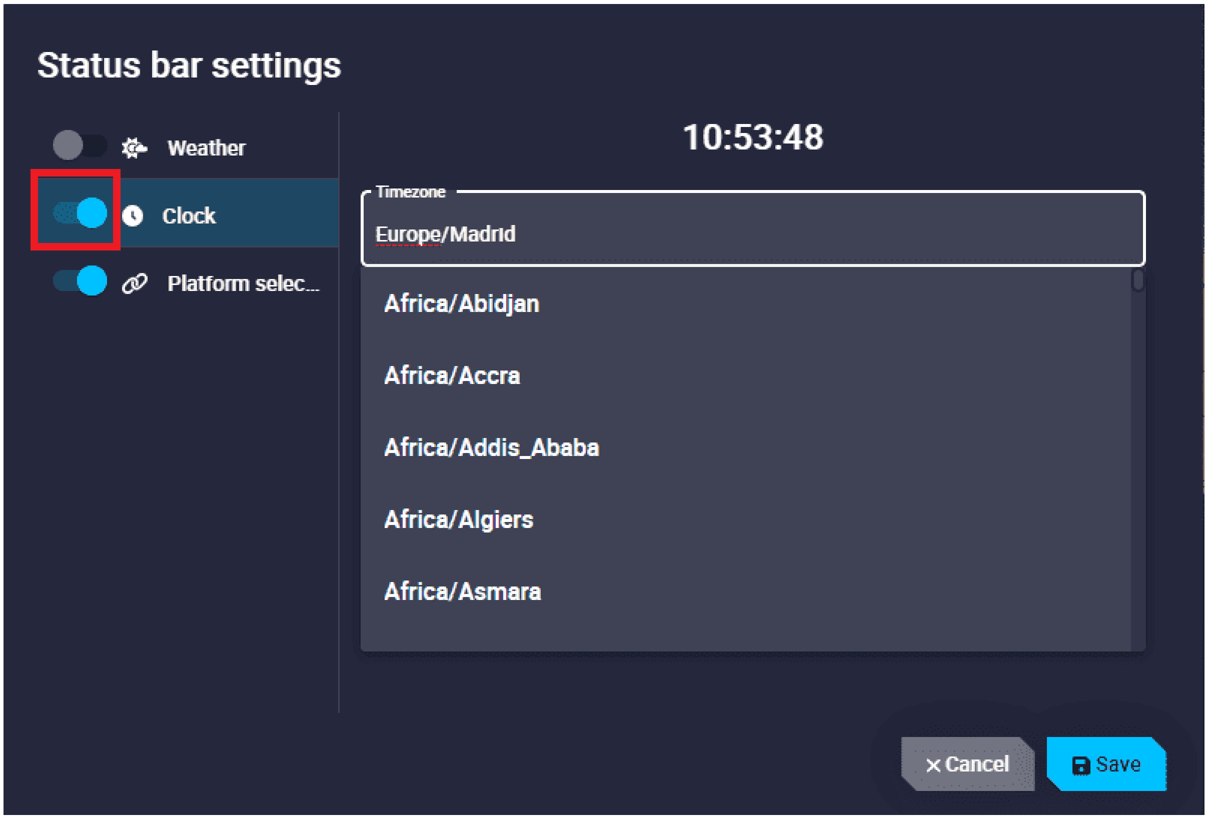


Fig. 15: **Clock section**

- **Platform selected**

  This element informs the user whether a Veronte Autopilot 1x is **not connected**, **connected**, **disconnected** or **in maintenance mode**, and the name of this device.

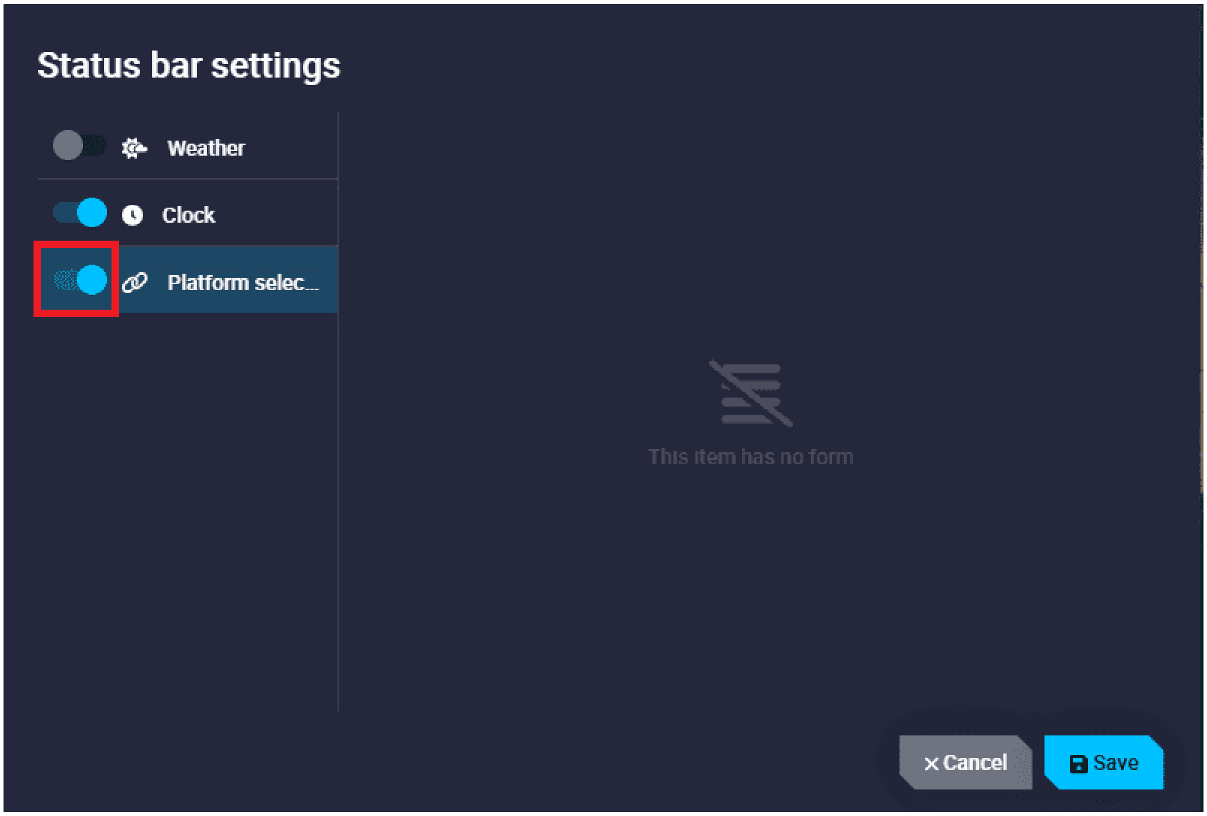


Fig. 16: **Platform selected section**

The figures below show all 1x autopilot states:

- **Not connected**:

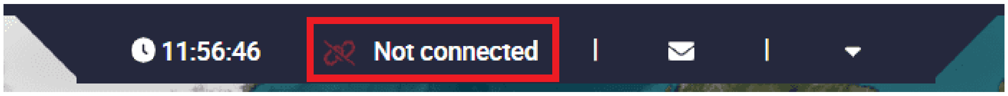


Fig. 17: **Platform selected - Autopilot not connected**

- **Connected**:

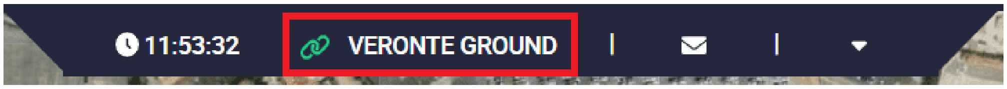


Fig. 18: **Platform selected - Autopilot connected**

- **Maintenance mode**:

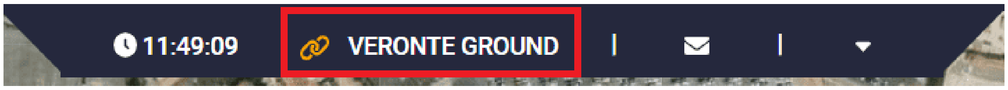


Fig. 19: **Platform selected - Autopilot in maintenance mode**

- **Disconnected**:

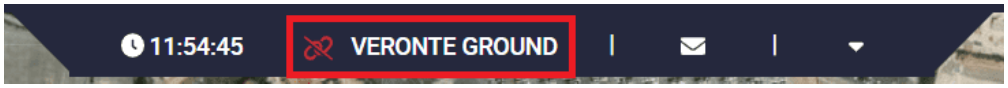
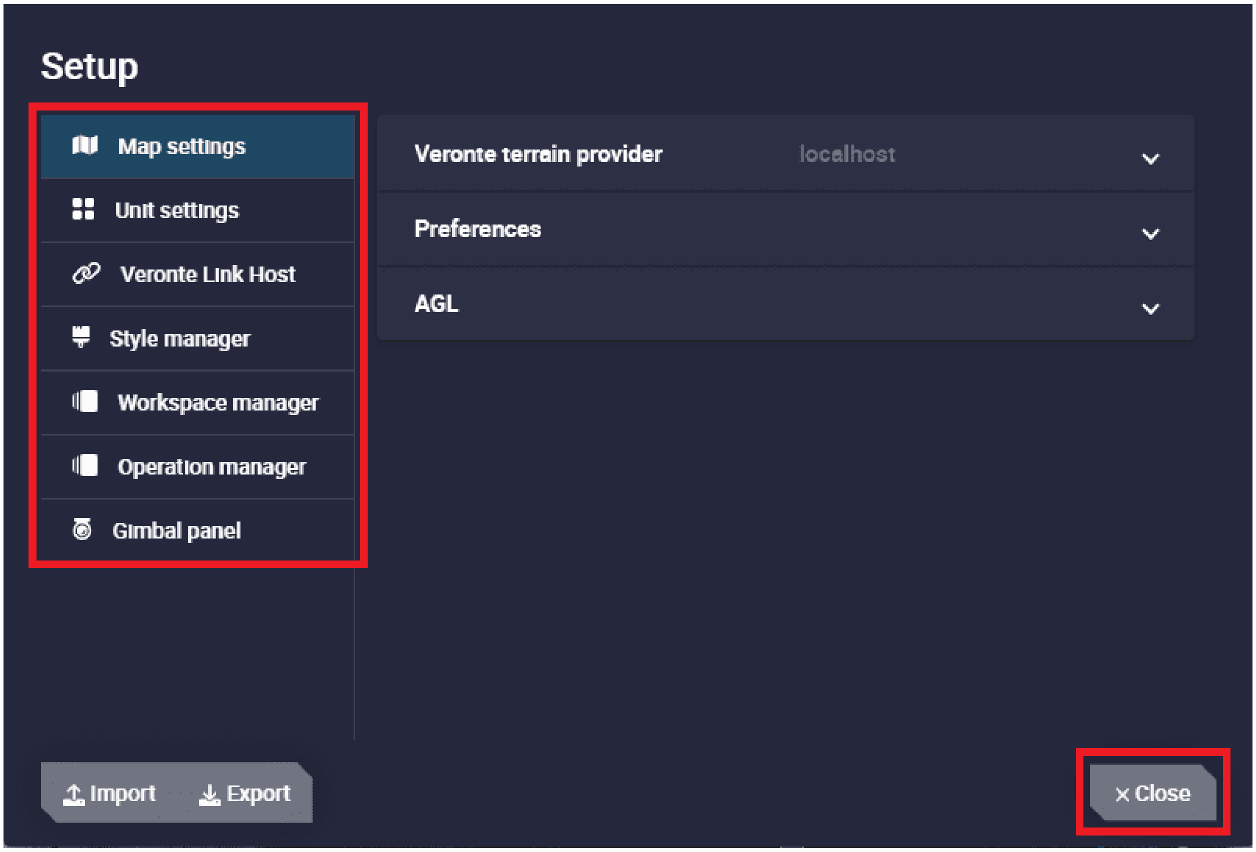


Fig. 20: **Platform selected - Autopilot disconnected**

3.1.1.2.4 Setup

This menu allows to edit the general settings of Veronte Ops:



Veronte terrain provider: localhost

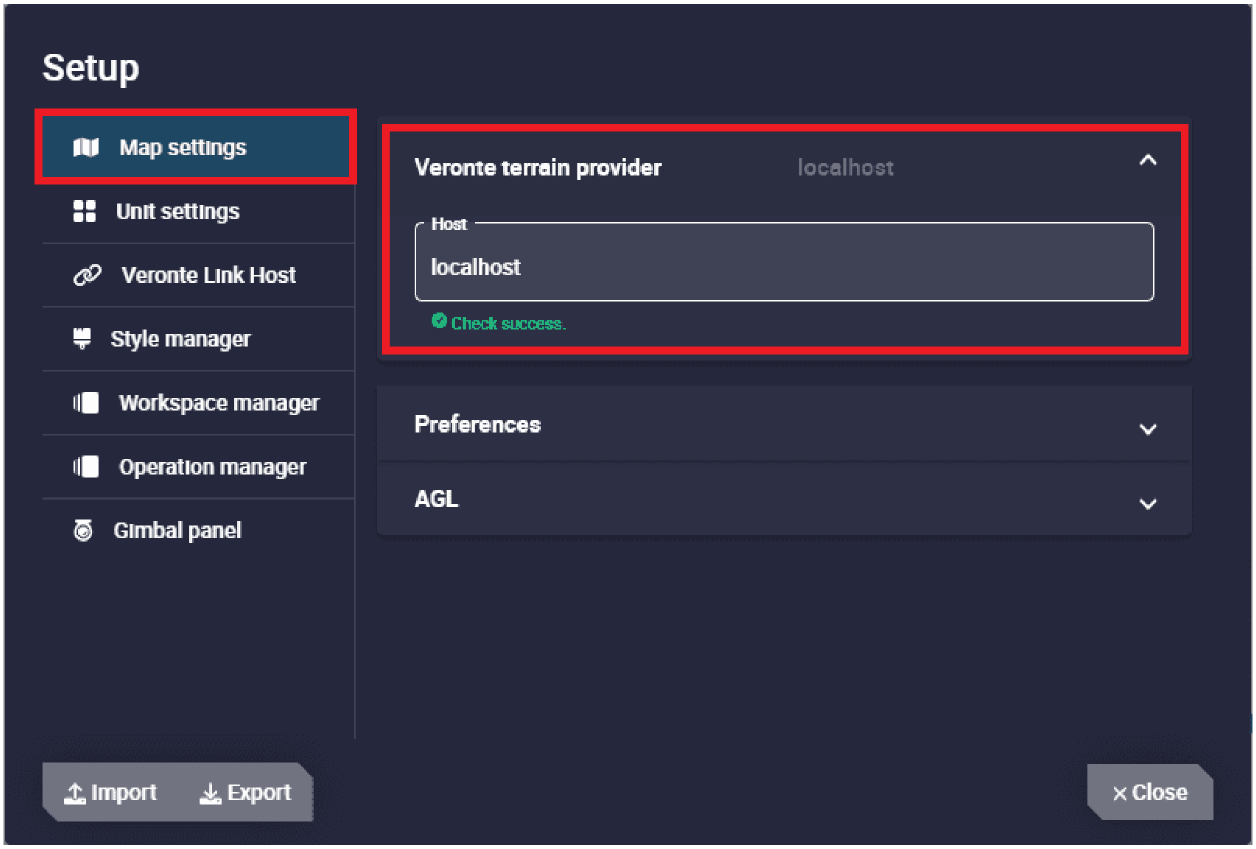
Fig. 21: **Status bar - Setup**

Note: Clicking the '**Close**' button, in the bottom right corner of the menu, will **close** this window **and save** any changes made.

- **Map settings**

  In this menu, it is possible to edit the terrain data settings, such as:

  - Veronte Ops **SRTM data provider**: By default, this is the additional application *Veronte terrain provider*, but users can enter another SRTM data provider that is on the PC.



Veronte terrain provider localhost

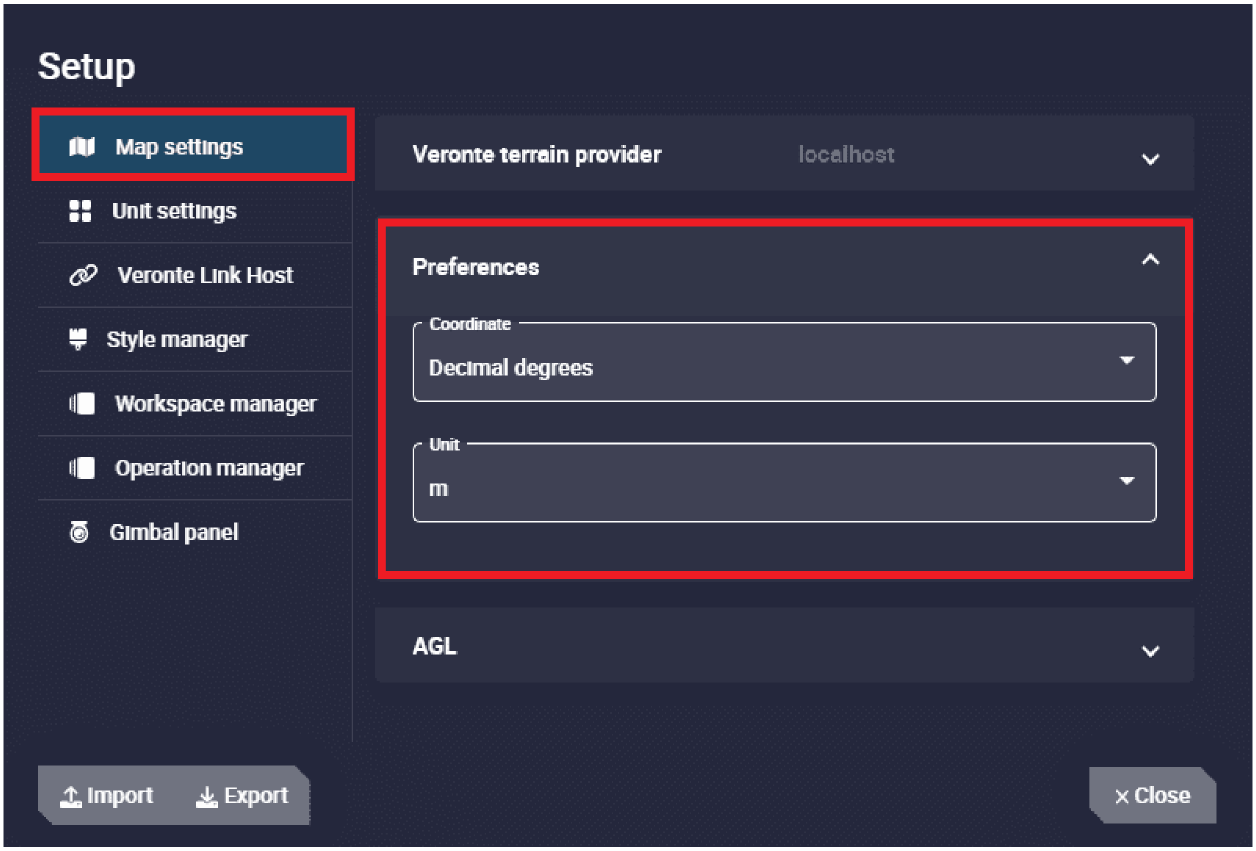
Host: localhost

Check success.

Fig. 22: **Map settings section - Veronte terrain provider**

- **Preferences**

  Users can customize the coordinates and height units of the map.



Setup

Map settings

Unit settings

Veronte Link Host

Style manager

Workspace manager

Operation manager

Gimbal panel

Veronte terrain provider localhost

Preferences

Coordinate: Decimal degrees

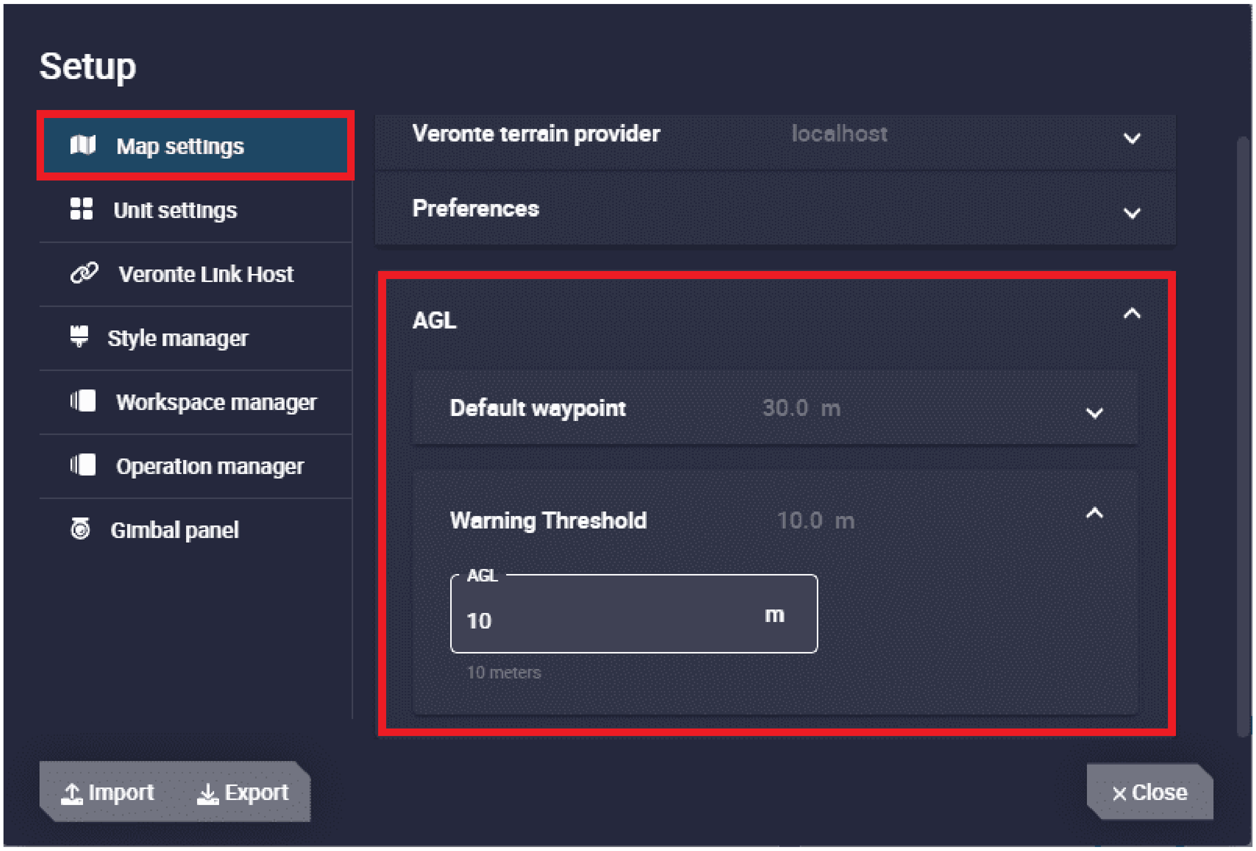
Unit: m

AGL

Fig. 23: **Map settings section - Preferences**

- **Coordinate**: Select the units of the coordinates. The available options are **Decimal degress**, **Degrees**, **UTM** and **MGRS**.
- **Unit**: It is possible to select the units of the height from the drop-down menu.

– **AGL**



Veronte terrain provider localhost

Preferences

AGL

Default waypoint 30.0 m

Warning Threshold 10.0 m

AGL 10 m

10 meters

Fig. 24: **Map settings section - AGL**

- **Default waypoints**: Enter the default altitude, in AGL, of the waypoints created.
- **Warning Threshold**: It is possible to add a warning threshold to **avoid collision with terrain**. This will appear as a line when users open the '**elevations**' option in the created route.

  For example, if the warning threshold is set to 10 metres, a **red warning line** will be drawn in the 'elevations' menu **10 metres above each terrain point**.

  Also, if the **mission path intersects this line**, Veronte Ops will interpret this as the route **colliding with the terrain**:

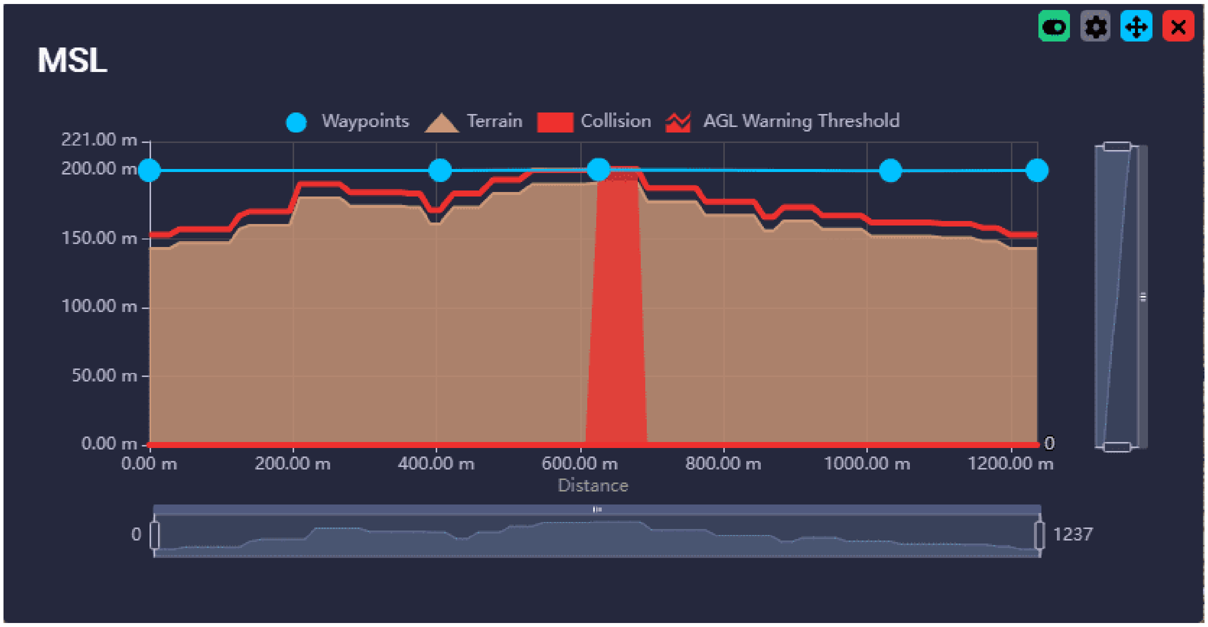
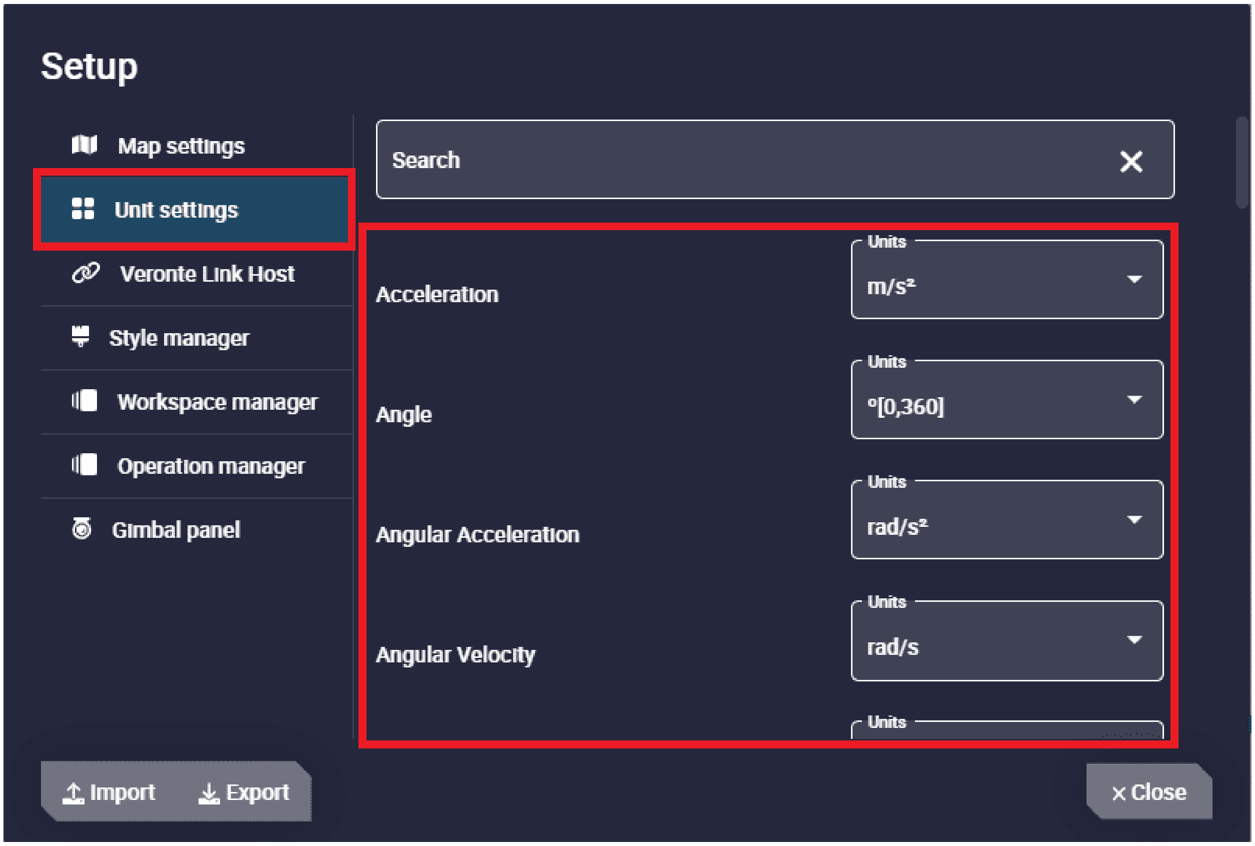


Fig. 25: **Map settings section - Warning**

- **Unit settings**

  This panel shows all the system units available for the system variables.

  They are sorted by variable type in alphabetical order: acceleration, temperature, velocity, etc.



Acceleration — Units: m/s²

Angle — Units: °[0,360]

Angular Acceleration — Units: rad/s²

Angular Velocity — Units: rad/s

Fig. 26: **Unit settings section**

The following table shows all the units available in Veronte Ops:

Variable Type	Units
Acceleration	[m/s^2] [ft/s^2] [in/s^2] [g]
Angle	rad[-;] °[-180;180] °[0;360] [° ‘ “] [rad] rad[0;2] °
Angular Acceleration	[rpm/s] [rad/s^2] [rad/m^2] [rad/h^2] [°/s^2] [°/m^2] [°/h^2]
Angular Velocity	[rad/s] [rad/m] [rad/h] [rps] [rpm] [rph] [°/s]
Area	[m^2] [cm^2] [mm^2] [km^2] [mile^2] [ft^2] [yd^2]
Baudrate	[Bd] [kBd] [MBd]
Centimeters/Pixels	[cm/pixel]
Current	[A] [mA]
Data	[bit] [byte] [KB] [GB] [bytes/s]
Decibel	[dB]
Density	[kg/m^3]
Flow Rate	[m^3/s] [gal/s] [gal/h] [l/s] [l/h]
Force	[N] [kN] [lbf] [pdl]
Frequency	[Hz] [mHz] [kHz]
Jerk	[m/s^3]
Length	[m] [km] [mi] [NM] [yd] [ft] [in] [cm] [mm]
Magfield Variance	[T^2]
Magnetic Flux Density	[T] [mG] [gauss] [nT]
Mass	[kg] [g] [tonnes] [lbs] [oz]

continues on next page

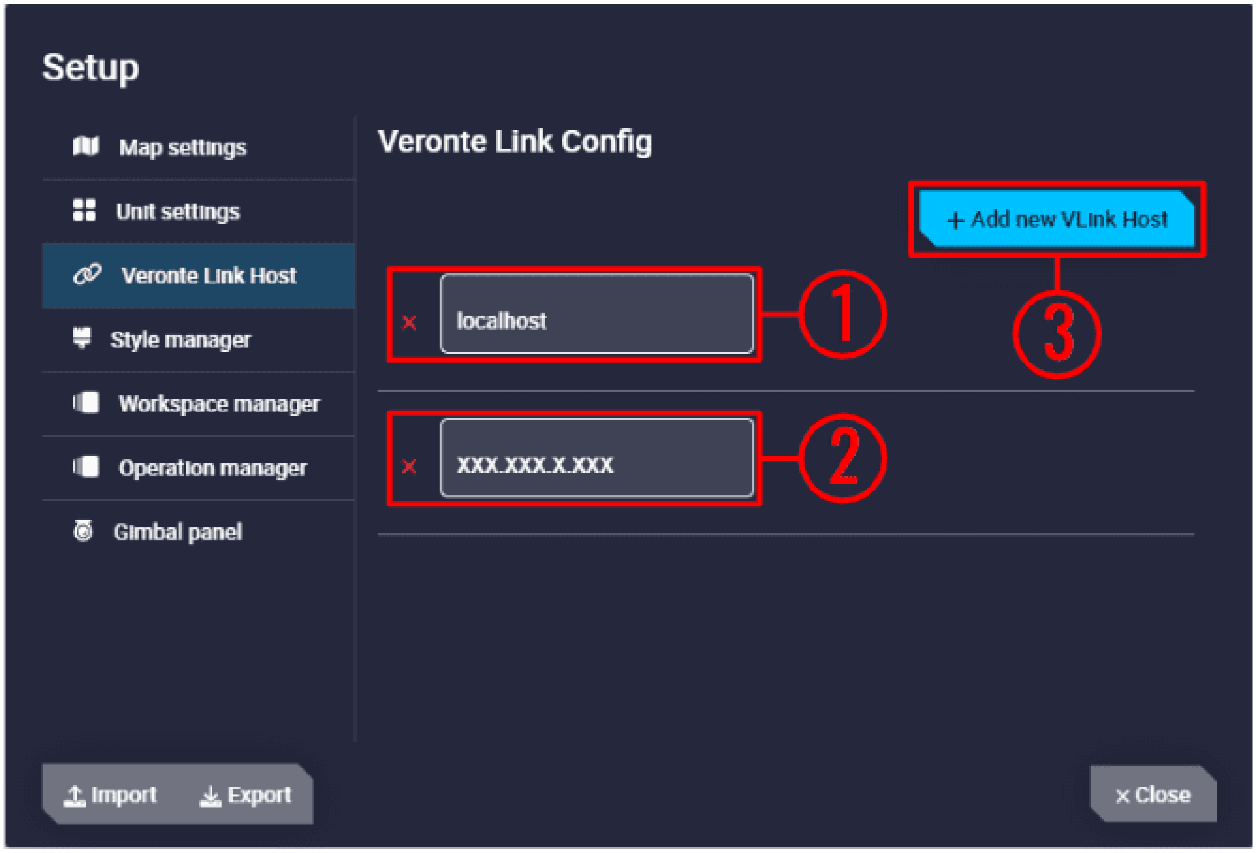
Table 1 – continued from previous page

Variable Type	Units
Numeral System	[bin] [octal] [dec] [hex]
Percentage	[x1] [%]
Power	[W] [kW] [Kgm/s] [erg/s] [CV]
Pressure	[Pa] [kPa] [bar] [mbar] [psi] [mmHg] [at] [atm]
Pressure Square Error Rate	[Pa^2/s]
Pressure Variance	[Pa^2]
Resistence	[]
Temperature	[K] [°C] [°F]
Time	[s] [min] [h] [s] [ms] [Time]
Transfer	[pkts/s]
Velocity	[m/s] [kt] [km/h] [mph] [ft/s] [mm/s] [ft/m]
Velocity Variance	[$(m/s)^2$] [$(cm/s)^2$] [$(mm/s)^2$]
Voltage	[V] [mV]
Volume	[m^3] [dm^3] [mm^3] [L] [mL]

- **Veronte Link Host**

  As Veronte Link is the Embention application that stores, reads and manages all the configurables of the products, the user can choose which Veronte Link to use to access the data, to access certain products.

  By default, the IP address 'localhost' is set, which is the Veronte Link on the same PC as Veronte Ops. However, it is also possible to connect Veronte Ops to a Veronte Link running on a different computer, simply by entering the IP address of that computer, so Veronte Ops will be able to access the devices connected to it.



localhost

xxx.xxx.x.xxx

Fig. 27: **Veronte Link Host section**

In the image above, users can identify:

1. The local IP: ‘localhost’
2. The IP address of another computer
3. **Add a new VLink Host**: It is possible to have access to several Veronte Link and therefore multiple users can manage the same Veronte Link, the same products.

If the user has any problems when trying to connect Veronte Ops to Veronte Link, see *Troubleshooting section -> Connecting to Veronte Link* of this manual.

- **Style manager**

  This section allows the user to import and export **custom widget styles**.

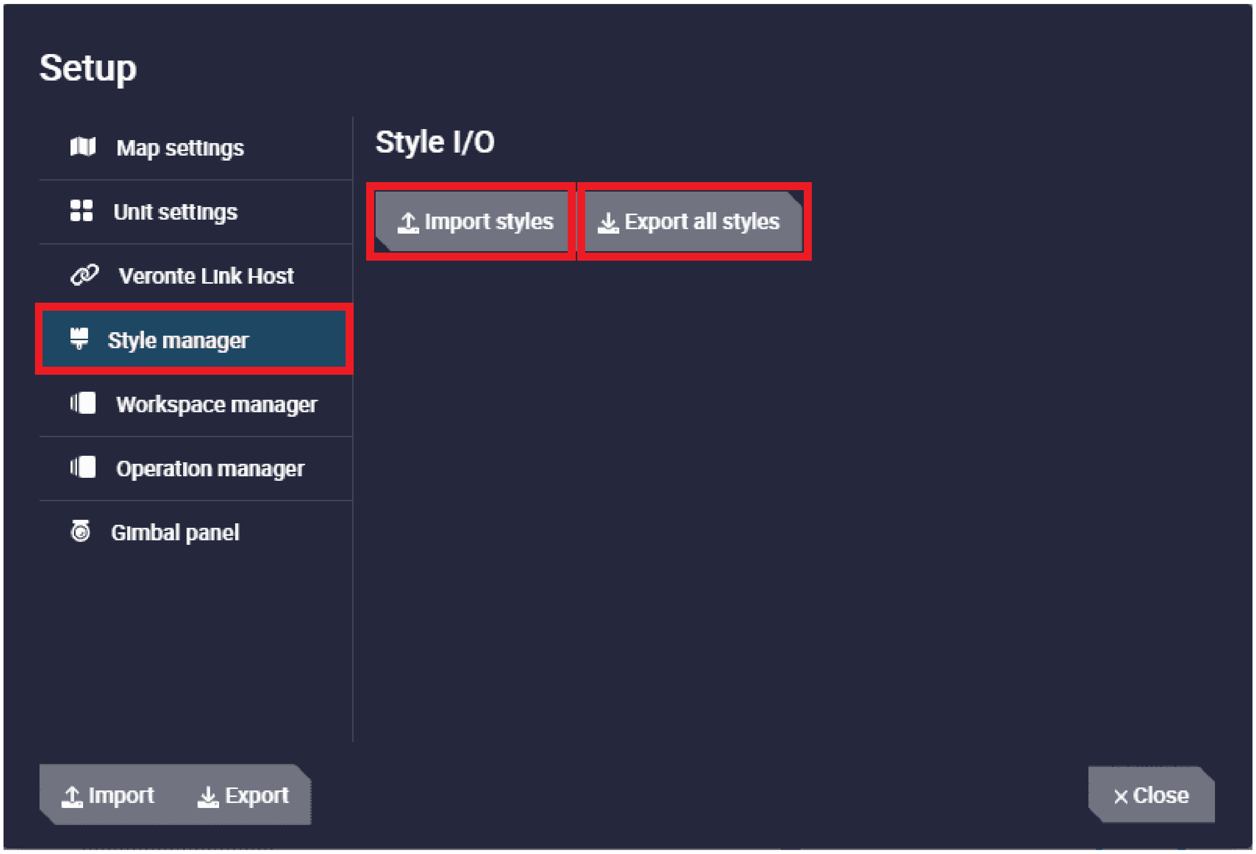


Fig. 28: **Style manager section**

- **Import styles**: By clicking here, users can import custom styles as a **zip folder** or by directly selecting all desired custom styles `.css` files.

  When the styles are imported, a notification will appear:

Styles updated

Fig. 29: **Style manager section - Import notification**

- **Export all styles**: By clicking here, all **custom** styles will be exported as a zip folder:

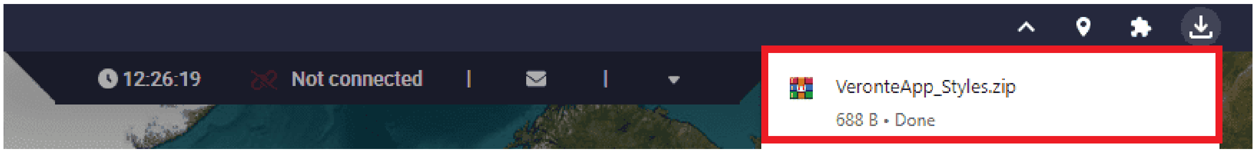
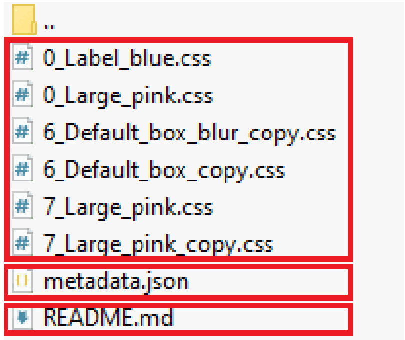


Fig. 30: **Style manager section - Export**

Note: **Default** widget styles will **not** be **exported**.

The zip folder will contain all the `.css` files with custom styles for the different widgets, a `metadata.json` file and a `README` file:



..
0_Label_blue.css
0_Large_pink.css
6_Default_box_blur_copy.css
6_Default_box_copy.css
7_Large_pink.css
7_Large_pink_copy.css
metadata.json
README.md

Fig. 31: **Style manager section - Exported files**

  - **metadata.json** file: This file contains the IDs of the styles that are assigned to the workspaces.

    Danger: It is advisable **not to modify** this file.

  - **README** file: Pay special attention to this file to find out how to create or modify a style.

- **Workspace manager**

  From this panel users can **delete** one, several or all **workspaces** created.

  To do this, simply **select** the **workspaces** to be deleted and then click on the '**Delete**' button.

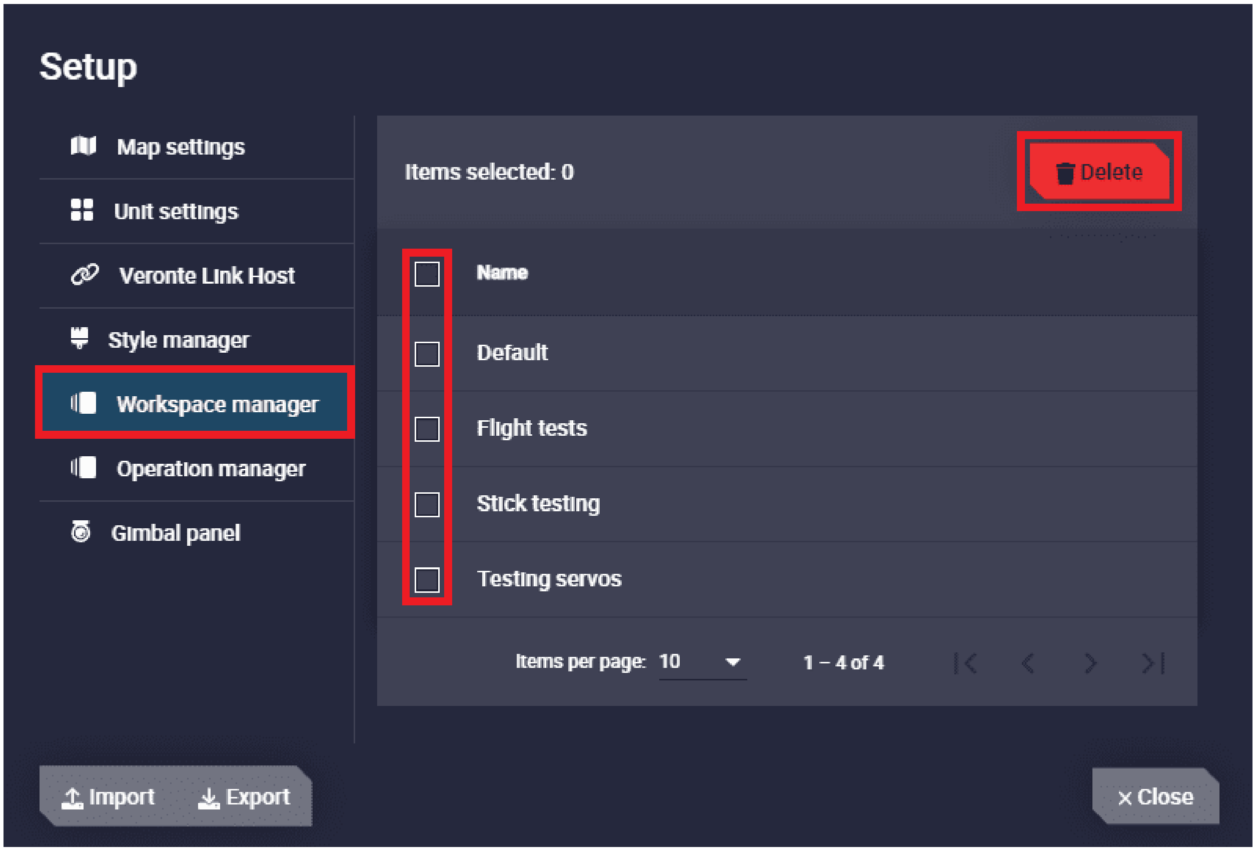
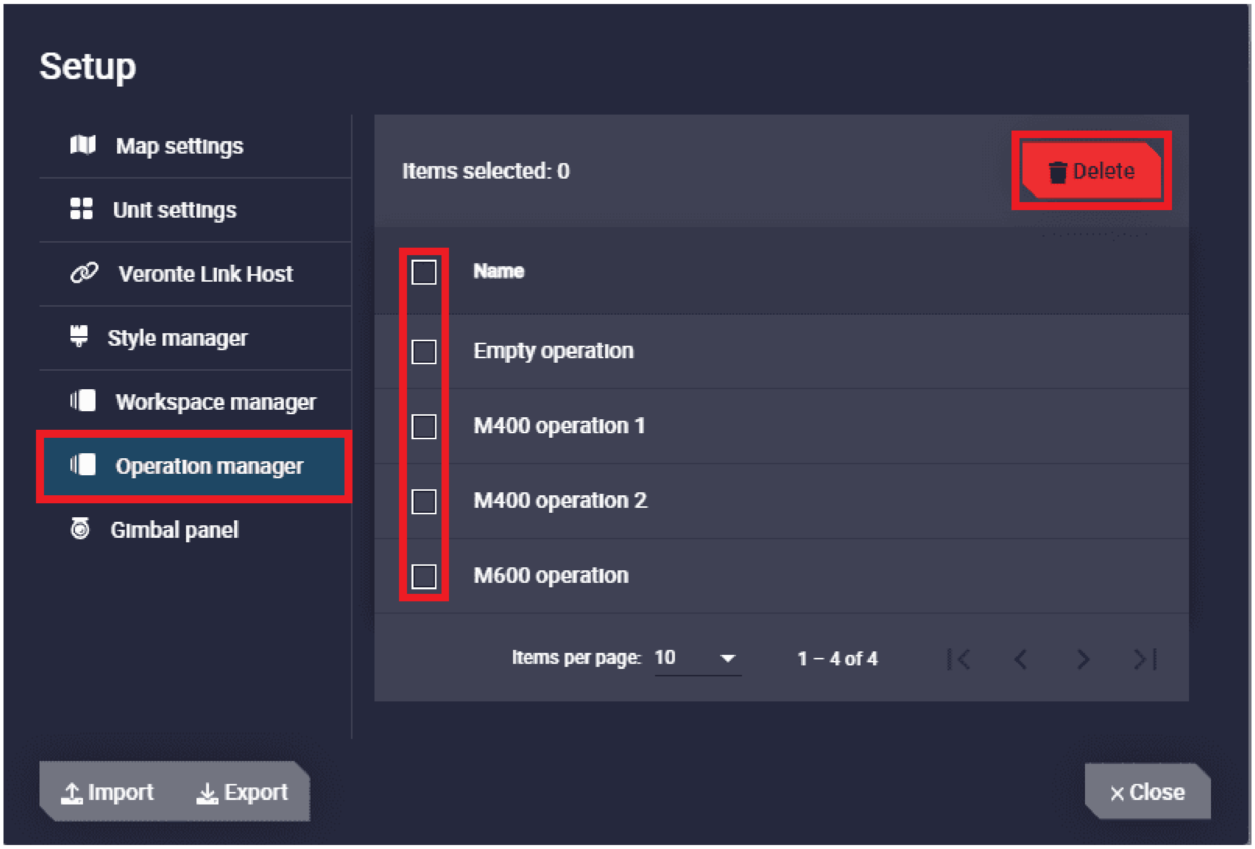


Fig. 32: **Workspace manager section**

- **Operation manager**

  From this panel users can **delete** one, several or all **operations** created.

  To do this, simply **select** the **operations** to be deleted and then click on the '**Delete**' button.



Items selected: 0

☐	Name
☐	Empty operation
☐	M400 operation 1
☐	M400 operation 2
☐	M600 operation

Items per page: 10 1 – 4 of 4

Fig. 33: **Operation manager section**

- **Gimbal panel**

  Users can add a predefined gimbal from this panel:

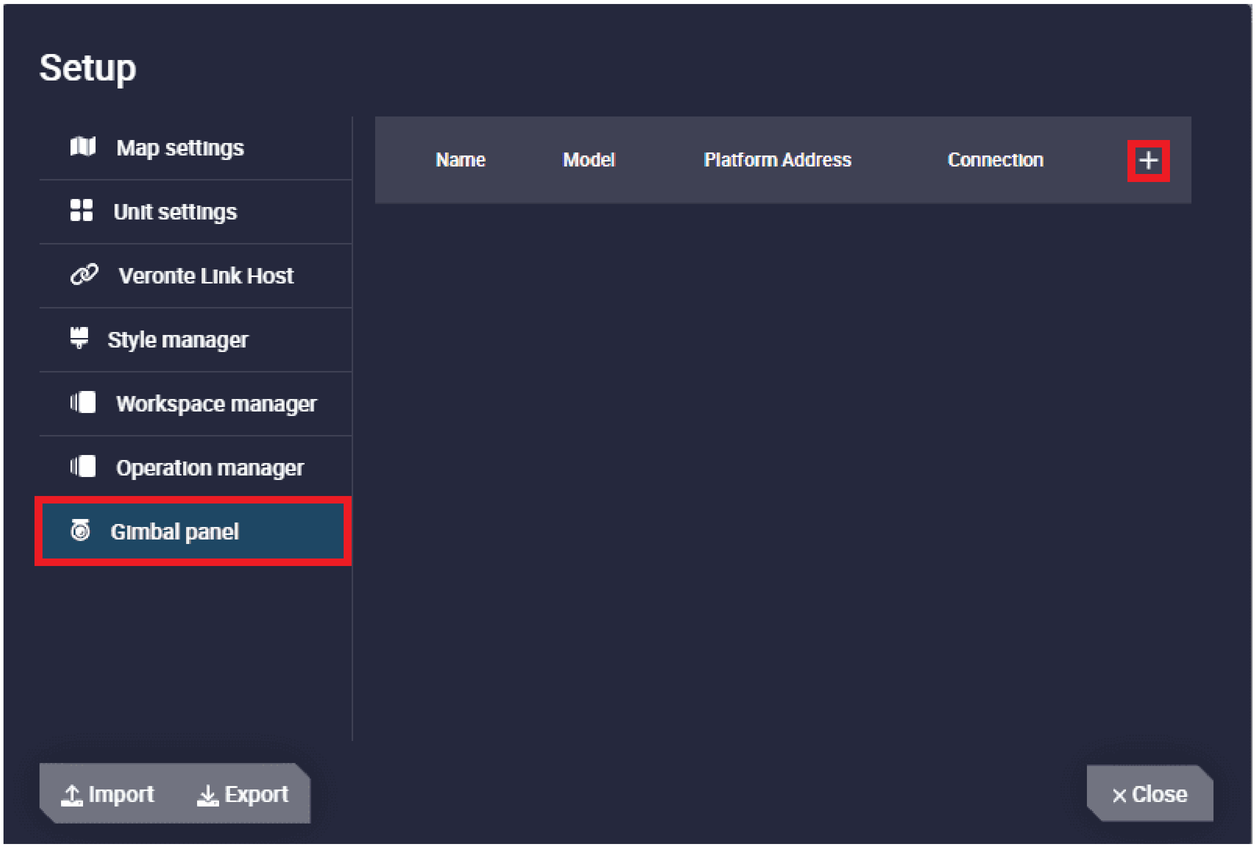


Fig. 34: **Gimbal panel section**

Clicking the + icon displays the following configuration panel to add a new gimbal:

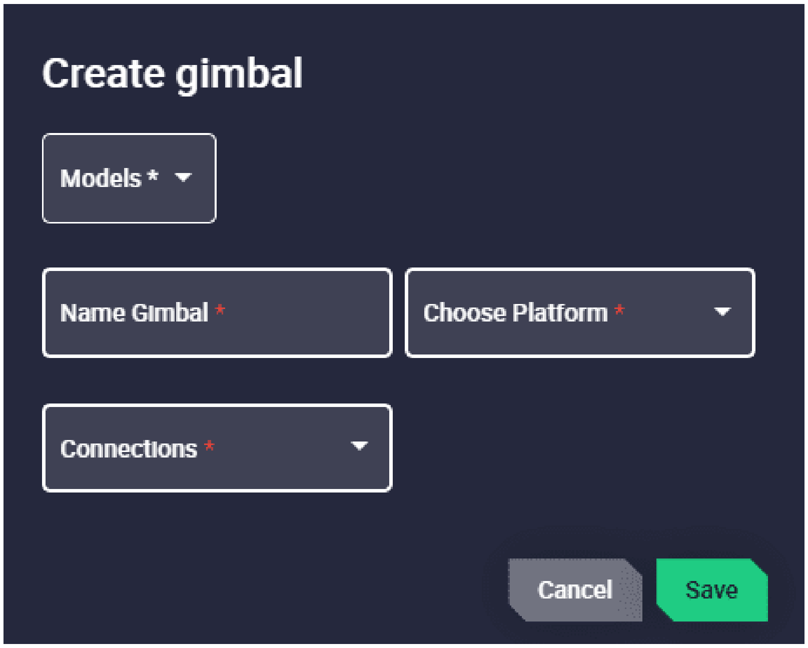


Fig. 35: **Gimbal panel section - Create gimbal**

- **Models**: Select a gimbal model from the list.
- **Name Gimbal**: Enter the desired name for the gimbal to be added.
- **Choose Platform**: Users must select the platform for which the gimbal is configured.

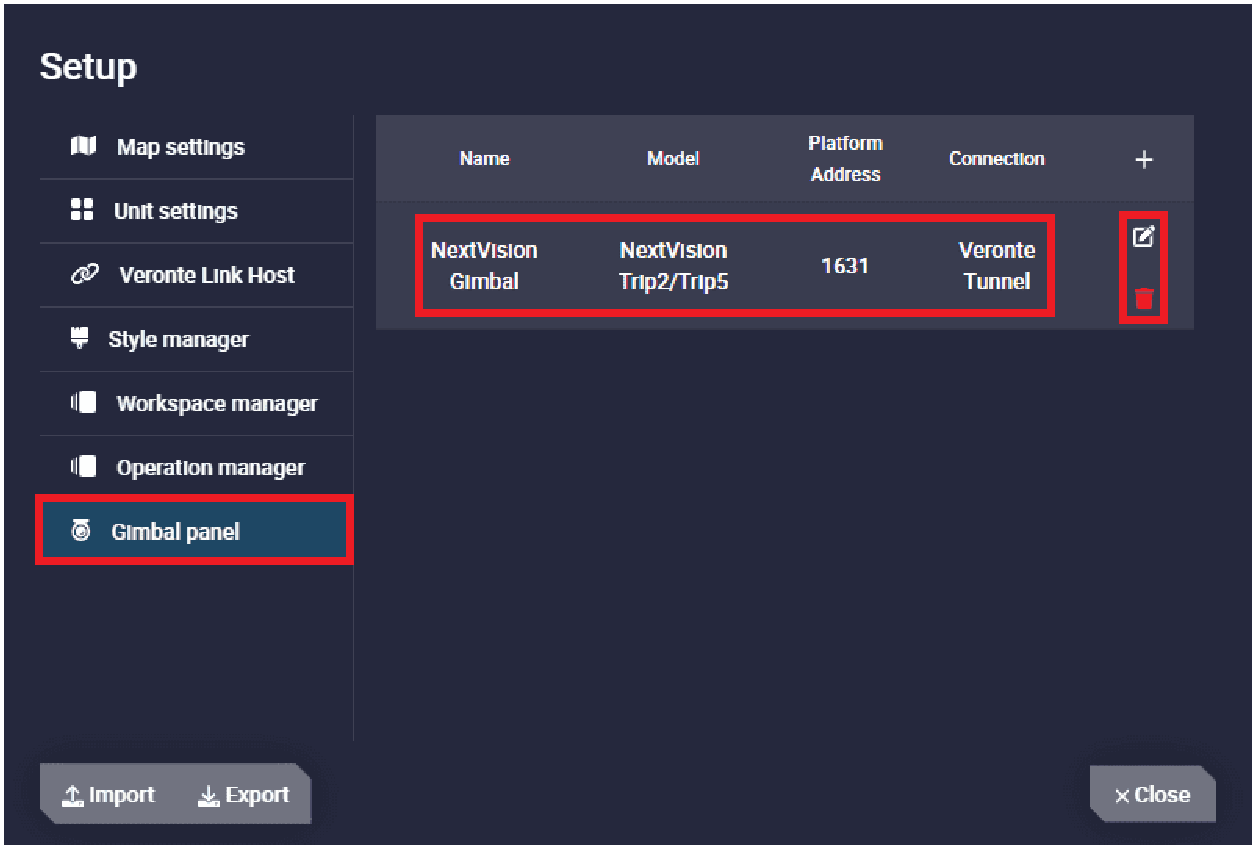
  The available options will always be the IDs of the connected autopilots 1x and '**Selected platform**', i.e. the platform that is selected.
- **Connections**: The type of connection through which Veronte Ops sends commands to the gimbal must be selected:
  - **Veronte Tunnel**: When choosing this connection type, **Veronte Autopilot 1x** tunnel is used to send commands to the gimbal.

    Users must also specify the Veronte tunnel port used: *1*, *2* or *3*.

    Warning: Be careful! This port must match the Tunnel port configured in the **1x PDI Builder** software.
  - **WebSocket**: In order to send commands via the *Web Converter application*, it is required to enter the **websocket_url** configured in that tool in the **URL** field and copy the **websocket_port** configured as the camera's udp connection in the **port** field.
- **Advanced**: Depending on the gimbal model chosen, some additional options can be configured which are characteristic of each gimbal.

  Note: This option will only appear after the selection of the gimbal model.

Then, the created gimbal will appear on the panel:



Name	Model	Platform Address	Connection
NextVision Gimbal	NextVision Trip2/Trip5	1631	Veronte Tunnel

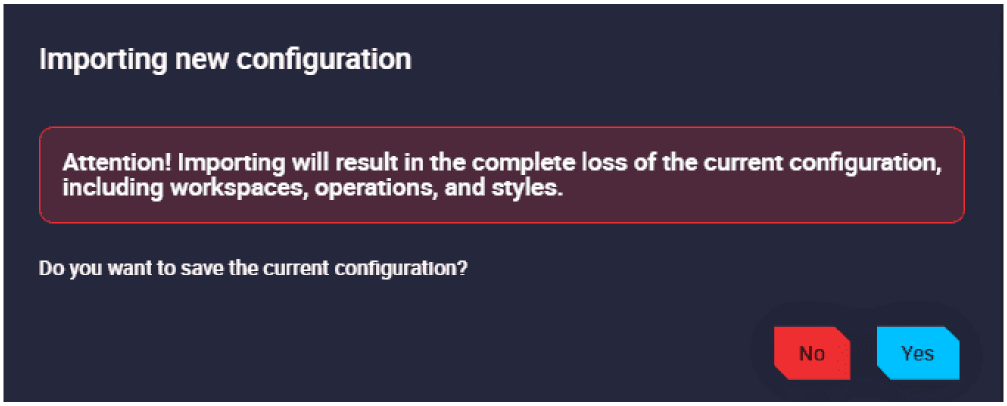
Fig. 36: **Gimbal panel section - Gimbal added**

  - ✎ **Edit gimbal**: Allows the user to access again to the configuration menu described above.
  - 🗑 **Remove Gimbal**: Removes this gimbal.

- **Import/Export** buttons

  Furthermore, all these settings can be **exported and imported** from one Veronte Ops to another, for example to move them from one PC to another.

  When the user tries to import a new Veronte Ops configuration, the following confirmation message will appear:



Attention! Importing will result in the complete loss of the current configuration, including workspaces, operations, and styles.

Do you want to save the current configuration?

Fig. 37: **Import Veronte Ops configuration**

3.1.1.2.5 Terms and Conditions

Users can consult the ‘End User License Agreement (**EULA**)’ by simply clicking on this button.

3.1.2 Feedback menu

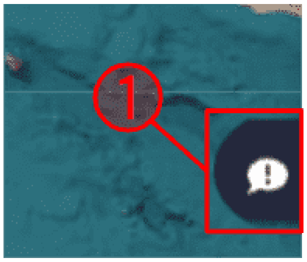
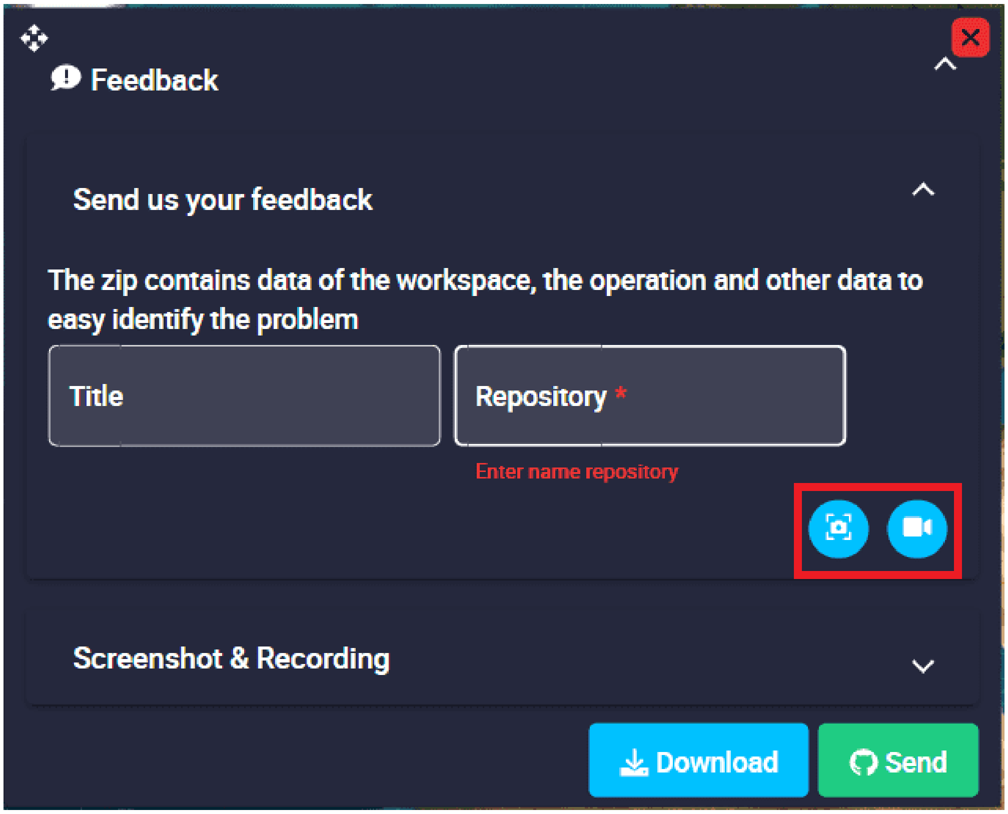


Fig. 38: **Feedback button**

Press the button above to access the Feedback menu:



The zip contains data of the workspace, the operation and other data to easy identify the problem

Enter name repository

Fig. 39: **Feedback menu**

Users can report a problem they have encountered by **creating an issue in their own ‘Joint Collaboration Framework’**

Note: The user’s ‘**Joint Collaboration Framework**’ is simply a **own Github repository for each customer**.

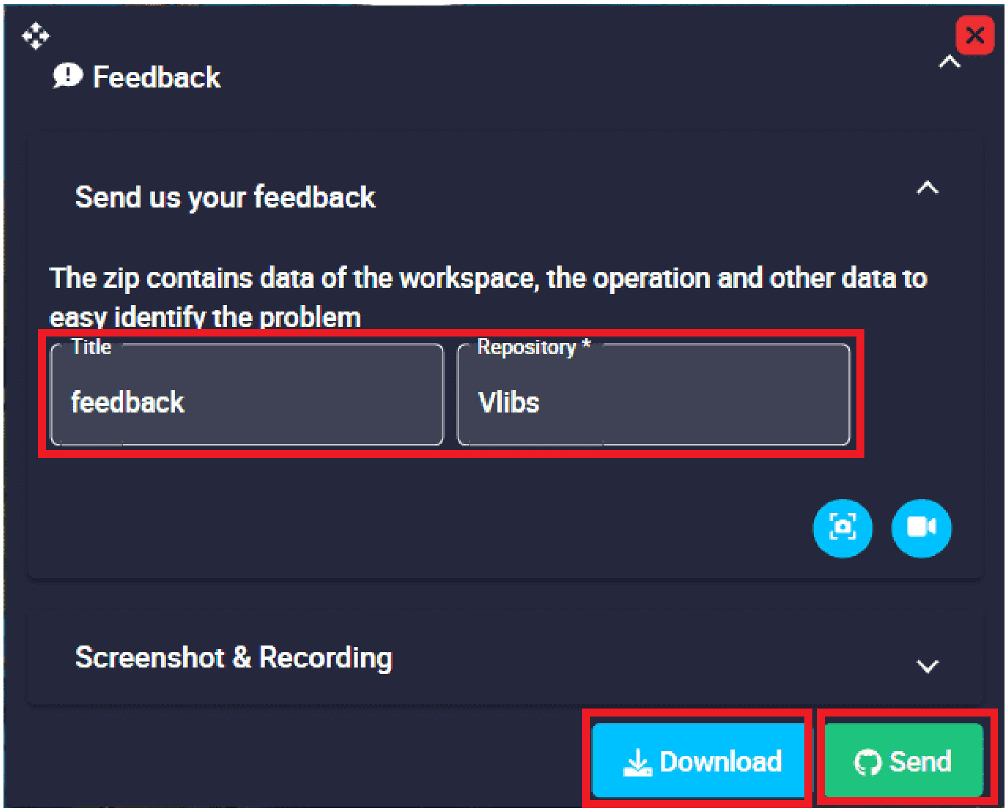
In case of having any question about this **Joint Collaboration Framework**, please read its user manual.

It is also possible to take a snapshot or a recording of that problem.

Clicking on the **'Download' button** downloads a zipped folder with the data of the workspace, the operation and other data to easily identify the problem. It is advisable to attach this folder when creating the issue.

Finally, by clicking on the **'Send' button**, a Github window will open in the browser with an issue. This issue is created in the repository indicated before with the title that has been defined.

Find below an **example** of the creation of a feedback:

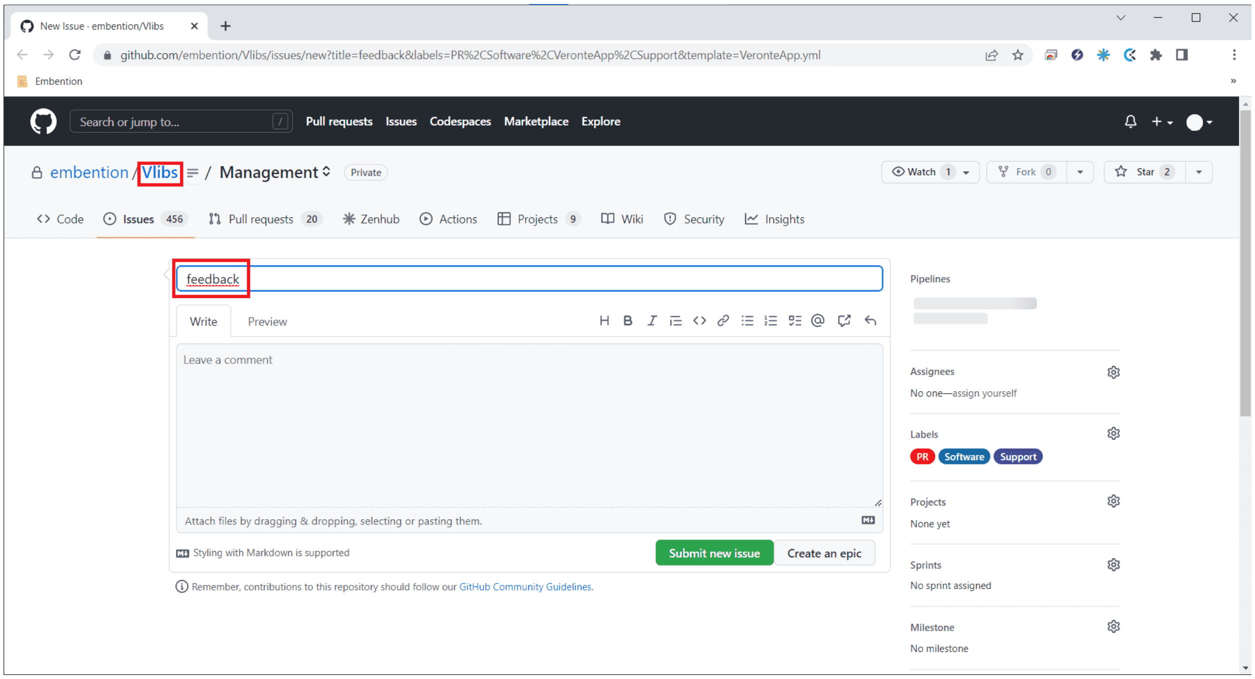


The zip contains data of the workspace, the operation and other data to easy identify the problem

Title: feedback

Repository *: Vlibs

Fig. 40: **Feedback example - Feedback menu**



github.com/embention/Vlibs/issues/new?title=feedback&labels=PR%2CSoftware%2CVeronteApp%2CSupport&template=VeronteApp.yml

feedback

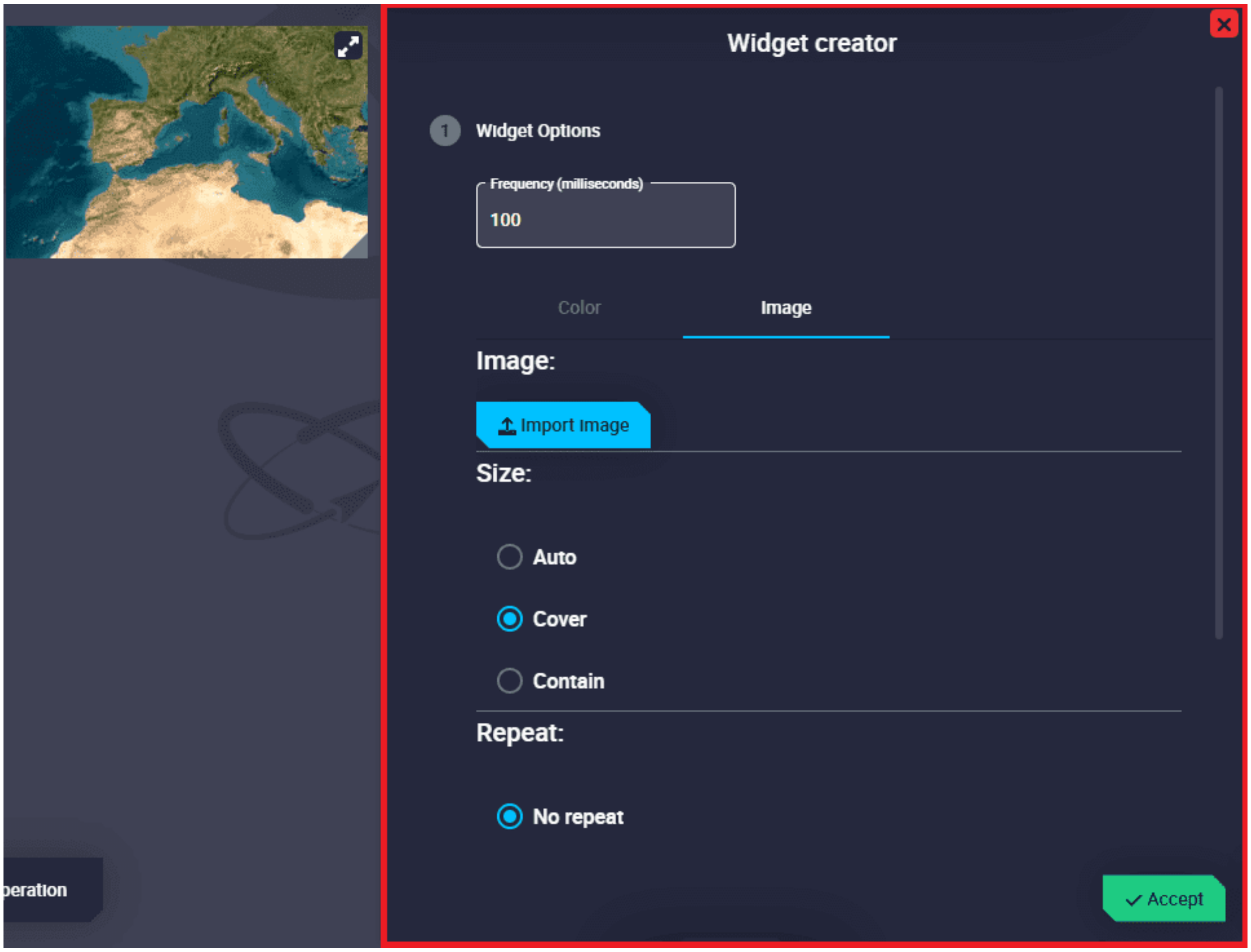
Fig. 41: **Feedback example - Issue created in Github**

3.1.3 Background configuration

It is possible to edit the background behind the map. To access this editing menu it is necessary to first **minimize the map** (or hide it) and then **right click on the background**:

Fig. 42: **Access background edition**

In this menu, users will find:



Frequency (milliseconds)
100

Image:

Size:

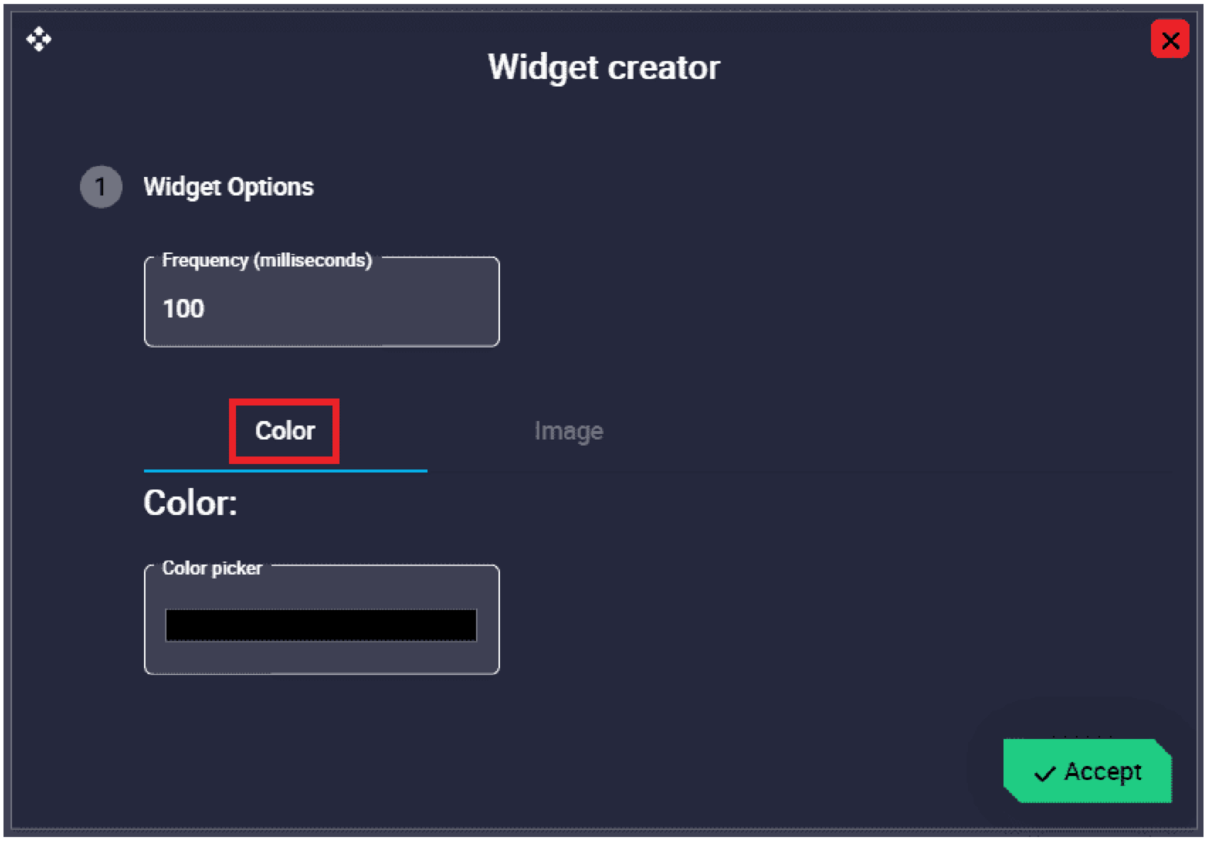
○ Auto
● Cover
○ Contain

Repeat:

● No repeat

Fig. 43: **Background edition**

1. **Widget options**: The user can change the refresh frequency of the workspace, of the widgets. By default this frequency is **100 miliseconds**.
2. **Background options**: Choose the type of background style between a color or an image:
    - **Color**: Users can select the desired color for the background.



Frequency (milliseconds): 100

Color picker

Fig. 44: **Background - Color**

- **Image**: When choosing 'Image', users must configure some parameters:

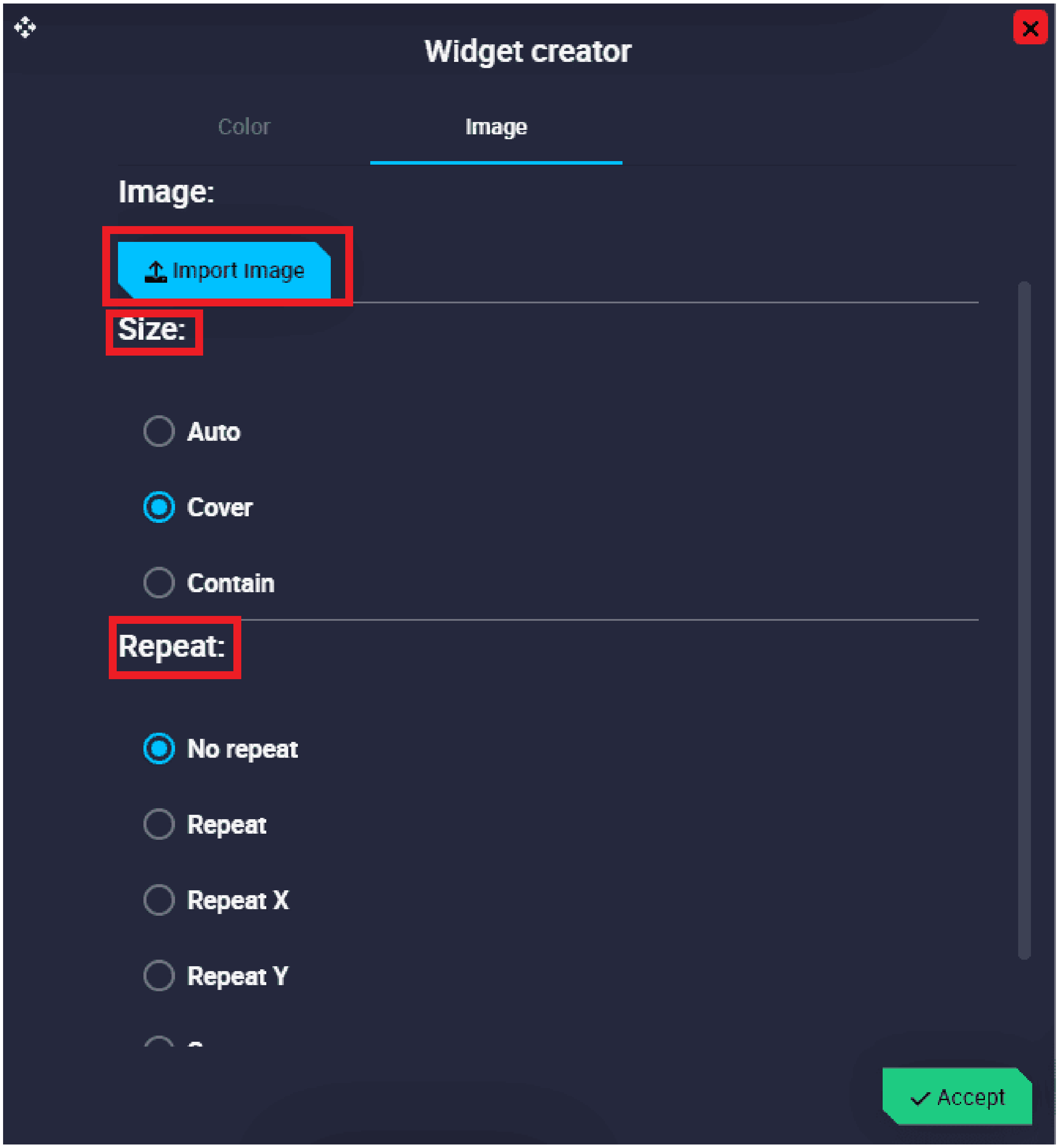


Fig. 45: **Background - Image**

- **Image**: A Veronte Ops image is set by default, but it is possible to import another image from the local PC.
- **Size**: The size of the background can be modified, the available options are: *Auto, Cover* and *Contain*.
- **Repeat**: The repetition of the image can also be customized, choose from: *No repeat, Repeat, Repeat X, Repeat Y, Space* and *Round*.

3.1.4 Platform icon

This icon allows the user to locate and follow the position of the platform at any time during the operation.

By **right-clicking** on it, users will access its **options**:

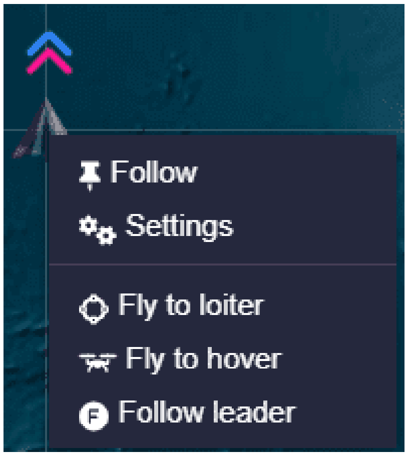


Fig. 46: **Platform icon options**

- **Follow**: Keeps the platform always centered on the map during operation.
- **Settings**: Users will access to the settings menu:

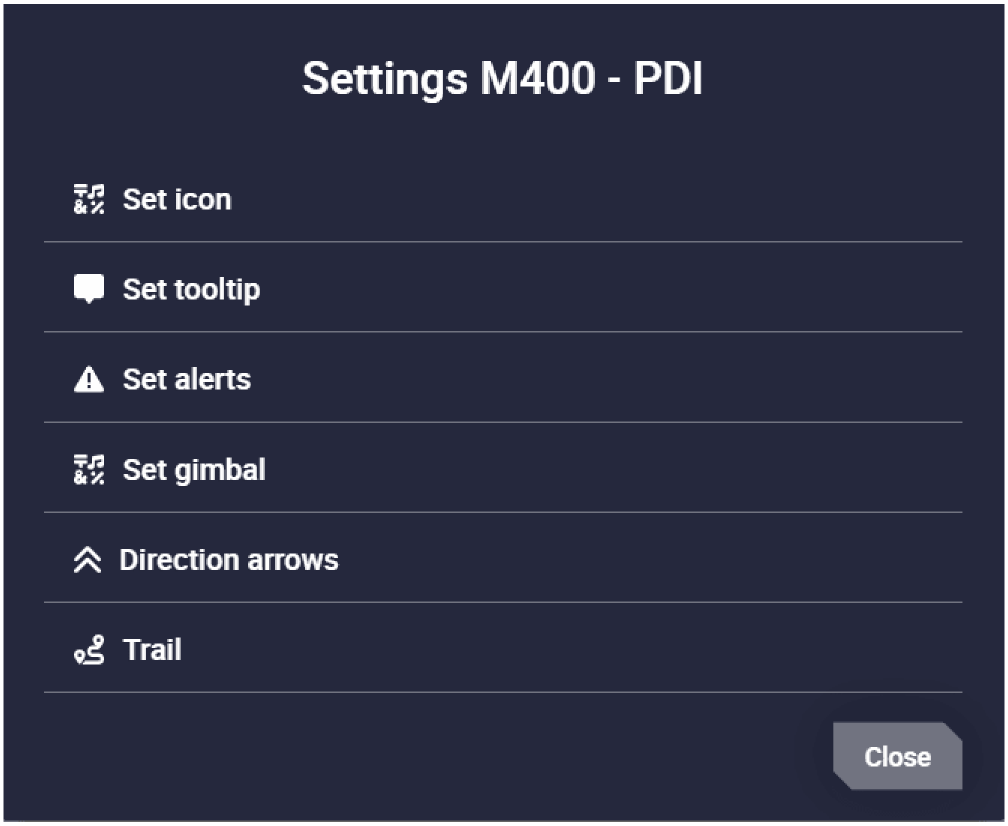


Fig. 47: **Platform icon settings**

- **Set icon**: Users can customize the icon that will be used to represent the position of this unit on the map. Simply choose one of the default icons or upload one from the laptop.

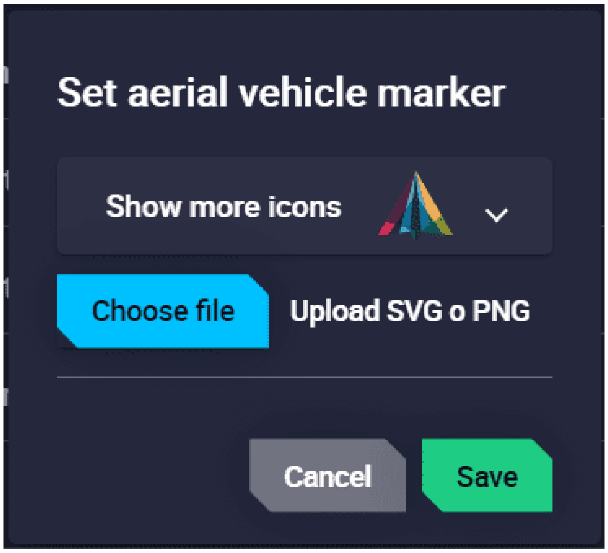


Fig. 48: **Platform icon settings - Set icon**

- **Set tooltip**: Allows the user to display a variable next to the platform icon.

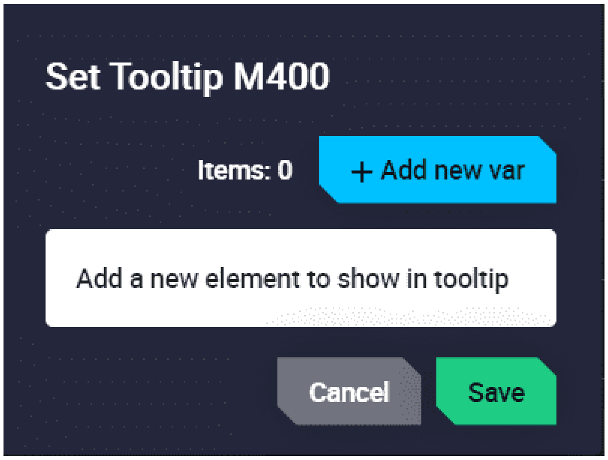
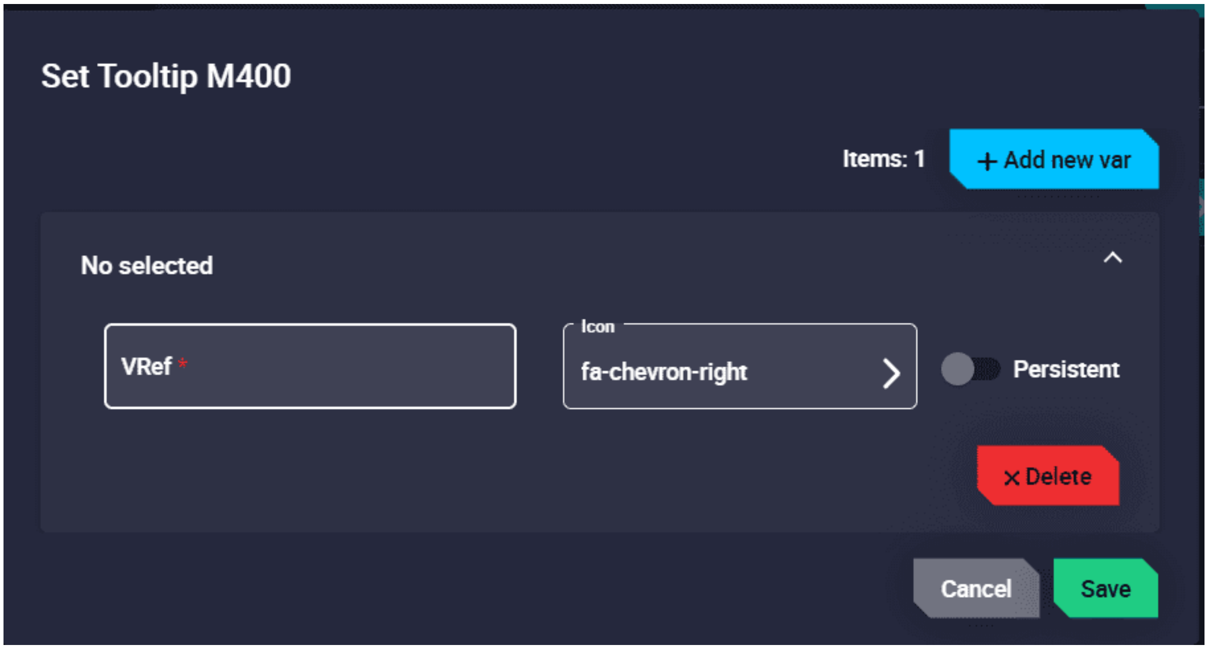


Fig. 49: **Platform icon settings - Set tooltip**

The following parameters must be configure by clicking on '**Add new var**':



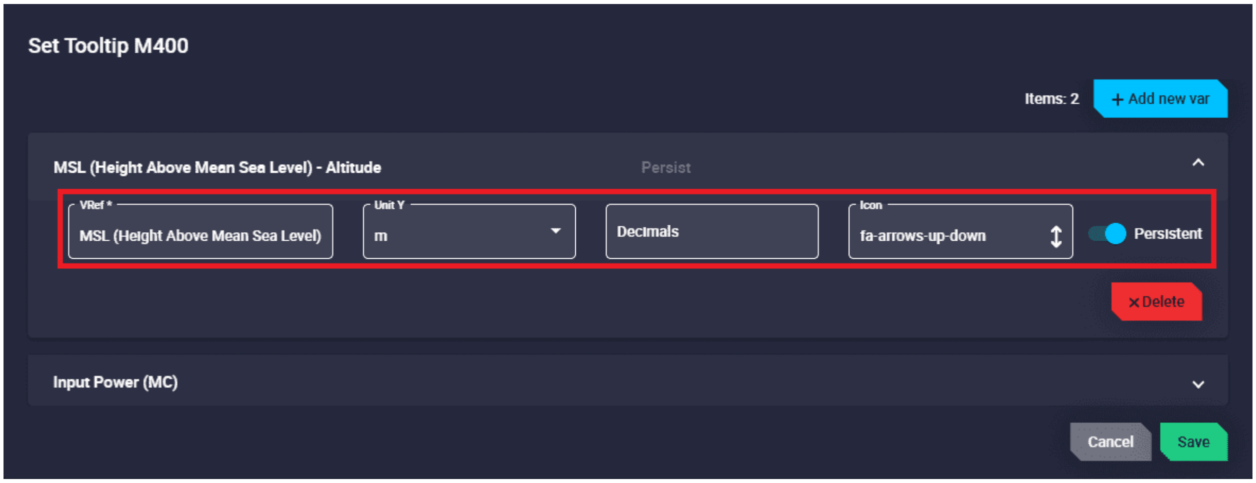
VRef *

Icon: fa-chevron-right

Fig. 50: **Platform icon settings - Set tooltip configuration**

- **VRef**: Select the desired variable to be displayed.
- **Unit** and **Decimals**: The units and decimals can also be modified. These parameters will appear depending on the variable chosen.
- **Icon**: Choose the icon to be shown next to the variable.
- **Persistent**: When **enabled**, this *tooltip* will **remain displayed during the operation**. **Otherwise**, it will **only** appear **when clicking** on the icon.

An example is shown here:



MSL (Height Above Mean Sea Level) - Altitude

VRef *: MSL (Height Above Mean Sea Level)

Unit Y: m

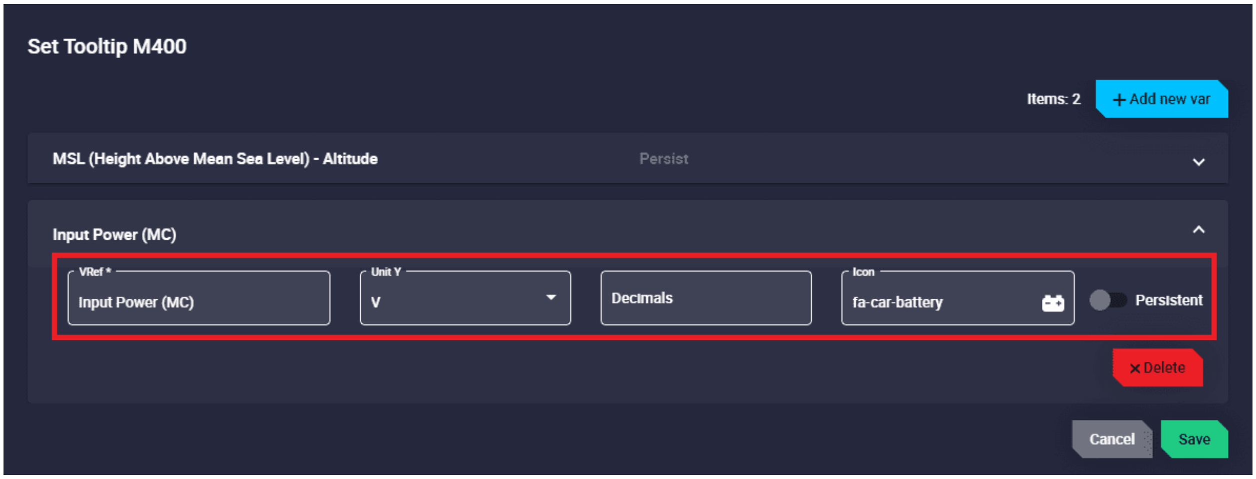
Decimals

Icon: fa-arrows-up-down

Persistent

Input Power (MC)

Fig. 51: **Platform icon settings - Set tooltip example**


Set Tooltip M400

Items: 2

MSL (Height Above Mean Sea Level) - Altitude

Input Power (MC)

VRef *: Input Power (MC)

Unit Y: V

Decimals

Icon: fa-car-battery

Fig. 52: **Platform icon settings - Set tooltip example**

Fig. 53: **Platform icon settings - Set tooltip example**

- **Set alerts**: These alerts are bit variables that appear next to the platform icon when in ‘error mode’.

  By default, the same bits that are sent in the autopilot ‘Status Message’ are configured as alerts. The user can add as many alerts as desired.

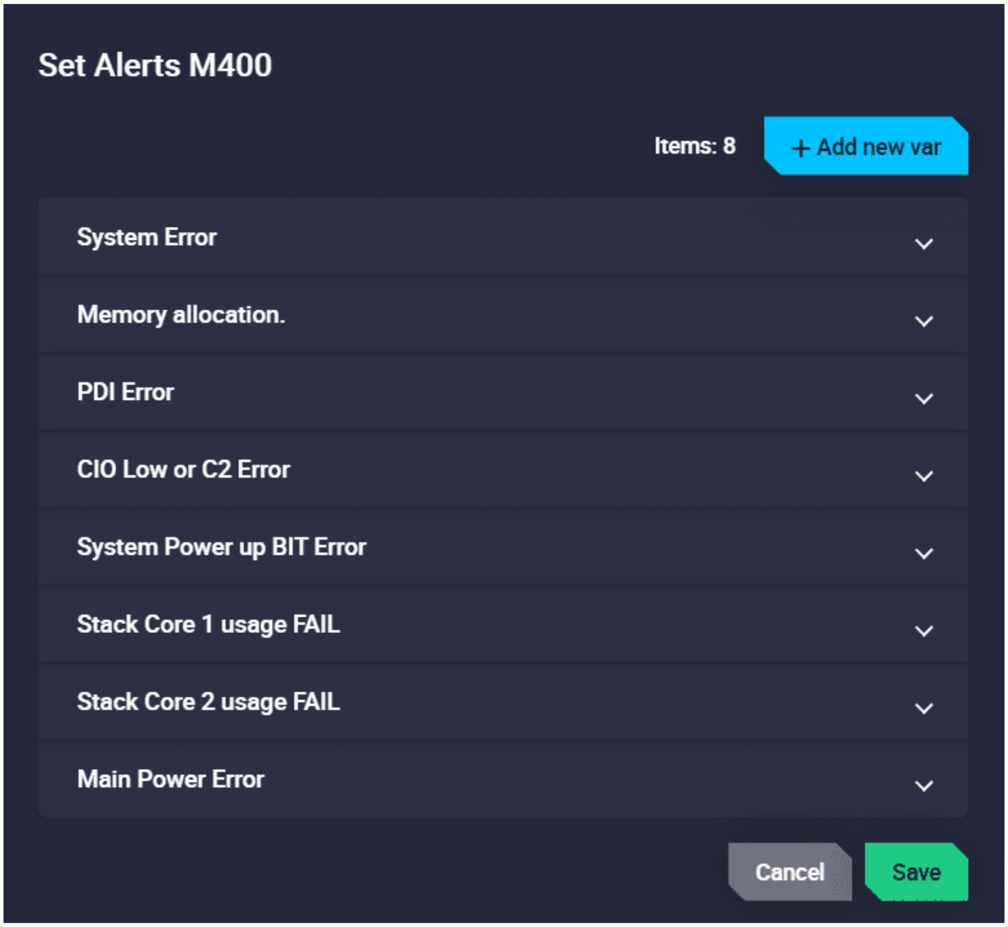


Fig. 54: **Platform icon settings - Set alerts**

They are displayed with the **icon**, which has been configured with them, **flashing red** when in ‘error mode’. When the platform icon is clicked on, the name of the variable that has triggered this alert will be displayed. An example is shown below:

Fig. 55: **Platform icon settings - Set alerts**

- **Set gimbal**: Allows the display of information on the map provided by the selected gimbal.

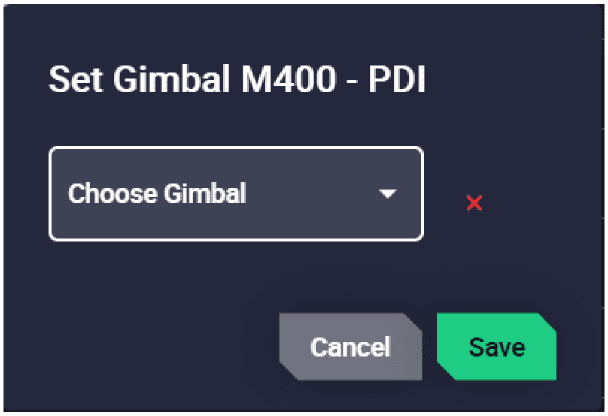


Fig. 56: **Platform icon settings - Set gimbal**

    - ∗ **Choose Gimbal**: Select the desired gimbal to add from those previously configured in the *Gimbal panel*.

  - **Direction arrows**: Users can change the color of the yaw and heading arrows.

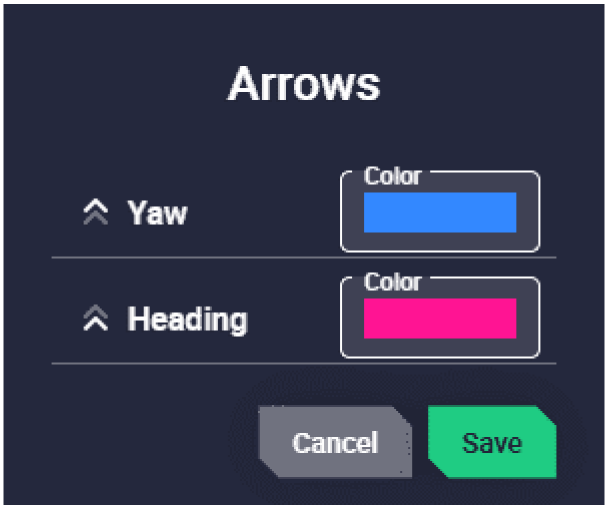
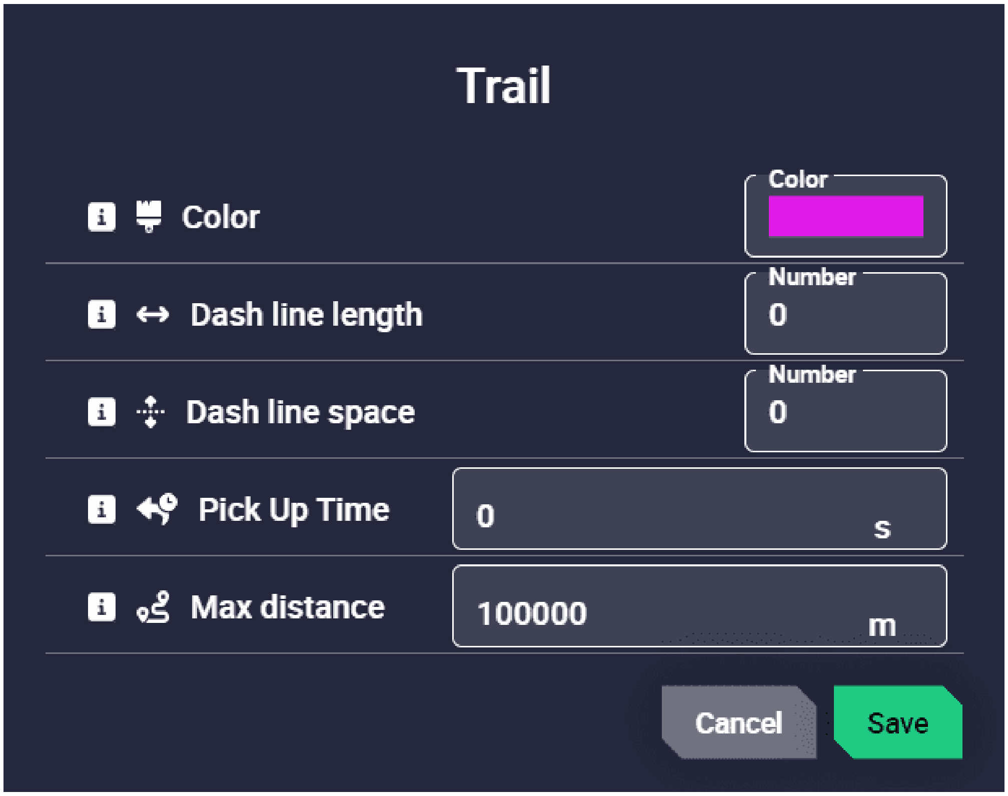


Fig. 57: **Platform icon settings - Direction arrows**

  - **Trail**: The trail path of the platform can be customized.



Trail

Color — Color: 🟪

Dash line length — Number: 0

Dash line space — Number: 0

Pick Up Time: 0 s

Max distance: 100000 m

Fig. 58: **Platform icon settings - Trail**

  - **Color**: Set the color trail.
  - **Dash line length**: Sets the length of the dash line. This change is **visualized** when a **number other than of 0 is set**.
  - **Dash line space**: Sets the space between dash lines. This change is **visualized** when a **number other than of 0 and greater than** *dash line length* is set.
  - **Pick Up Time**: Sets the time for the first point of the trial to be removed. This change is **visualized** when the time is **other than 0 s**.
  - **Max distance**: Sets the maximum length of the path to be drawn.

- **Fly to loiter**: Create a volatile loiter and change the current route.

Note: The platform will remain the altitude it had before this command.

Fig. 59: **Platform icon - Fly to loiter**

- **Fly to hover**: Create a volatile waypoint and change the current route.

Note: The platform will remain the altitude it had before this command.

Fig. 60: **Platform icon - Fly to hover**

- **Follow leader**: With this action the platform will follow a moving object (it can be another platform). For more information on this, see Follow Leader automation of the **1x PDI Builder** manual.

The platform icon changes its appearance depending on the situation:

- **Platform disconnected**:
  - When Autopilot 1x is not connected, the platform icon is '**translucent grey**'
  - By default, it is placed in the world coordinates (0,0).

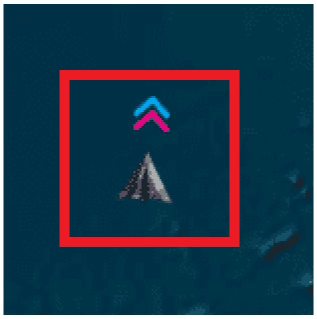


Fig. 61: **Platform icon - Translucent grey**

- **Platform connected**:
  - **During operation/configuration creation**:
    - The platform icon is '**translucent colored**', indicating that GPS data is not being received, i.e. **Position not fixed** status.
    - By default, it is placed in the world coordinates (0,0).

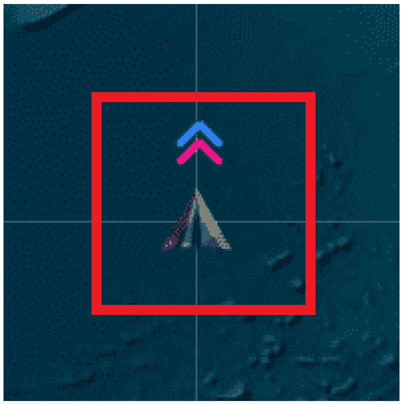


Fig. 62: **Platform icon - Translucent colored**

  - **During operation/simulation**:
    - The platform icon is '**colored**', indicating that GPS data is being received/simulated.
    - It is placed in the actual position/simulation position.

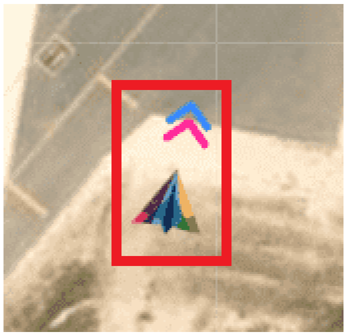


Fig. 63: **Platform icon - Colored**

3.2 Mission

The common way to work with **Veronte Autopilot 1x** is to create missions.

Missions can be created and managed through the ‘mission toolbar’ (left side of the menu (2)).

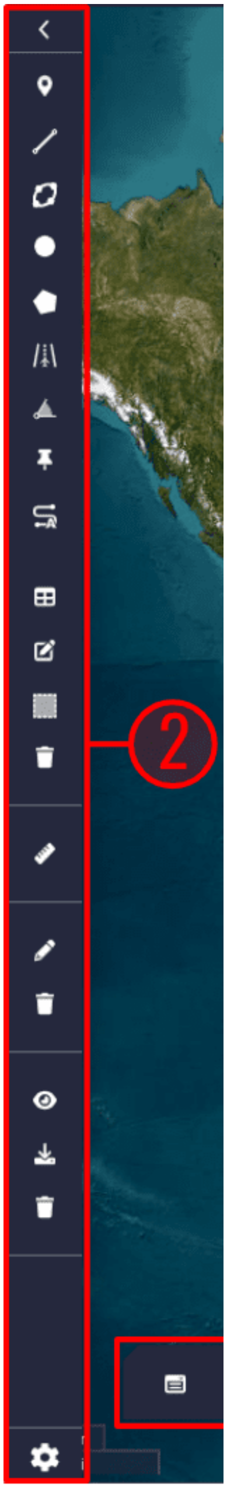


Fig. 64: **Mission toolbar**

The mission toolbar provides graphical tools to create the path that the aircraft follows while it is in cruise phase.

Multiple missions can be created for different purposes. The missions generated are stored in the **Operation folder of the PDI configuration files** when the user saves the changes. For more information on the folders containing the PDI files, see the initial menu of the Configuration section of the **1x PDI Builder** user manual.

Note: First, make sure the 1x Autopilot unit where the mission has to be upload is selected (*4. Platform –> Platform list*).

Next, a detailed description of the toolbar is given. It is divided into different functionalities:

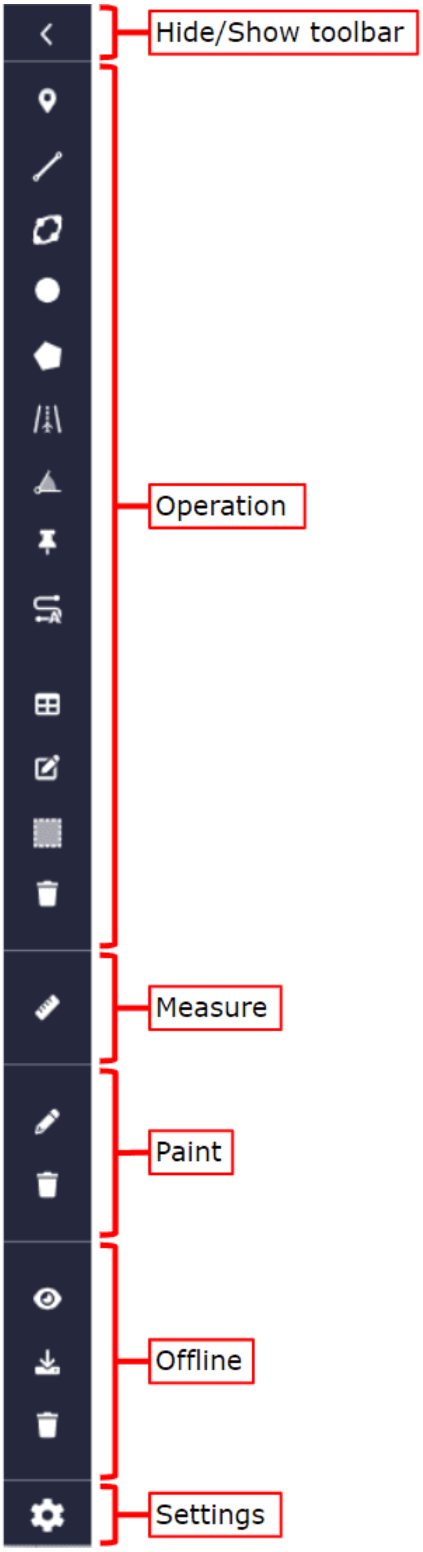


Fig. 65: **Mission toolbar functionalities**

3.2.1 Operation

All the tools in this 'section' allow the user to design the mission, such as waypoints, segments, marks, runways, etc.

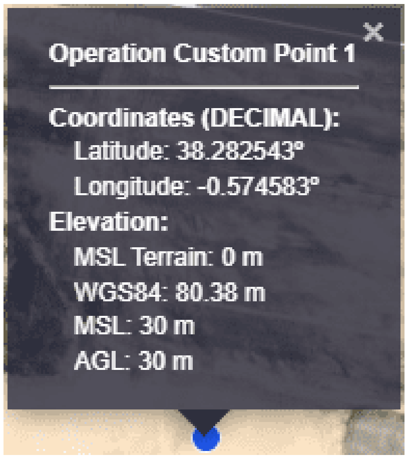
3.2.1.1 Waypoint

Use the Waypoint tool and click on the map to create new waypoints. Then, when users have created all the desired waypoint, **right-click on the map** to close/finish the 'creation event'.

To move waypoints, it is first necessary to activate *mission editing* by clicking on the icon. Then, simply drag it to the desired position.

In relation to waypoints, the following actions can be performed with the mouse:

- **Clicking once** on the waypoint will display a summary of the **waypoint information**, coordinates and elevation:



Operation Custom Point 1

Coordinates (DECIMAL):
Latitude: 38.282543°
Longitude: -0.574583°
Elevation:
MSL Terrain: 0 m
WGS84: 80.38 m
MSL: 30 m
AGL: 30 m

Fig. 66: **Waypoint information**

- **Right-clicking** on the waypoint, users will access to its **options**:

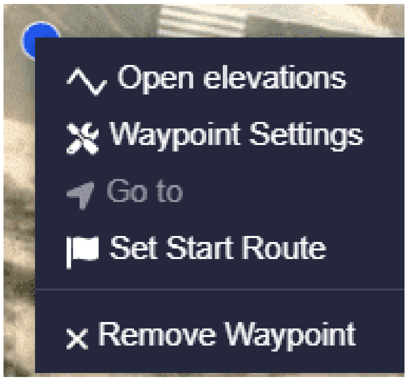
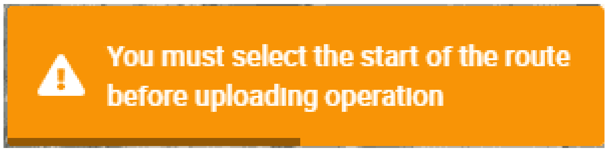


Fig. 67: **Waypoint options**

  - **Remove waypoint**: Deletes the waypoint.

- **Set Start Route**: Users must define where they want the cruise route to start by defining the waypoint as such with this option. The waypoint will turn of green color.

  Warning: If users do not define any waypoint as the 'Start Route', the operation will not be uploaded to the autopilot configuration and the following warning notification will be displayed:

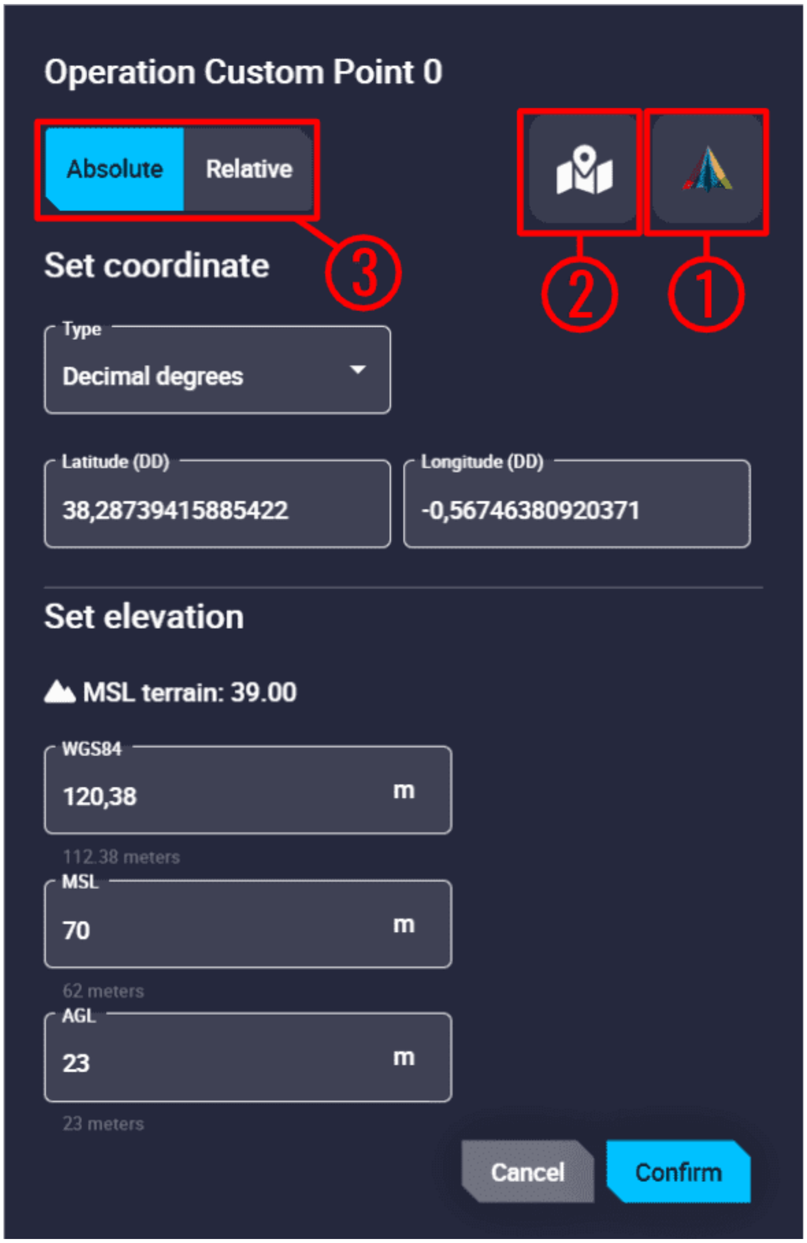
  You must select the start of the route before uploading operation

  Fig. 68: **Set start route - Warning notification**

- **Go to**: By clicking here, the platform will fly to this waypoint. If the waypoint belongs to a mission, the platform will continue that mission after reaching it.

  Note: This option is only available when a Veronte Autopilot 1x is connected and the operation, which the user is working on, is stored in the autopilot.

- **Waypoint Settings**: The user can change the configuration of the waypoint (coordinates and elevation) in the menu displayed here:



Type: Decimal degrees

Latitude (DD): 38,28739415885422

Longitude (DD): -0,56746380920371

MSL terrain: 39.00

WGS84: 120,38 m

112.38 meters

MSL: 70 m

62 meters

AGL: 23 m

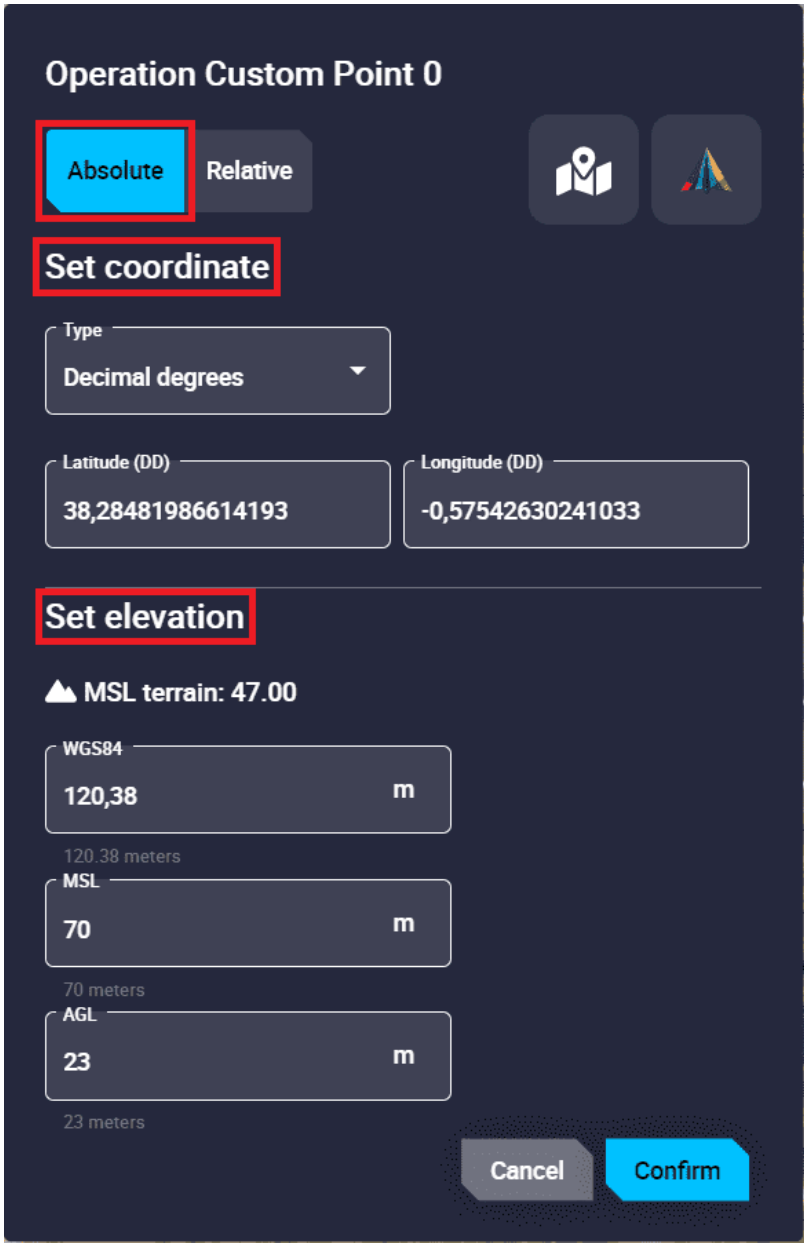
23 meters

Fig. 69: **Waypoint configuration**

There are 3 ways of defining the position of a waypoint manually:

1. **Matching it to the platform position**. By selecting the icon, the waypoint coordinates and elevation will be automatically updated with those of the actual platform's actual position.
2. **Selecting a position in the map**. Simply click on this icon, then click on the desired point on the map and the waypoint coordinates and elevation will be updated automatically.
3. Entering the exact coordinates and elevation here:

- **Absolute**:



Operation Custom Point 0

Type: Decimal degrees

Latitude (DD): 38,28481986614193

Longitude (DD): -0,57542630241033

MSL terrain: 47.00

WGS84: 120,38 m

120.38 meters

MSL: 70 m

70 meters

AGL: 23 m

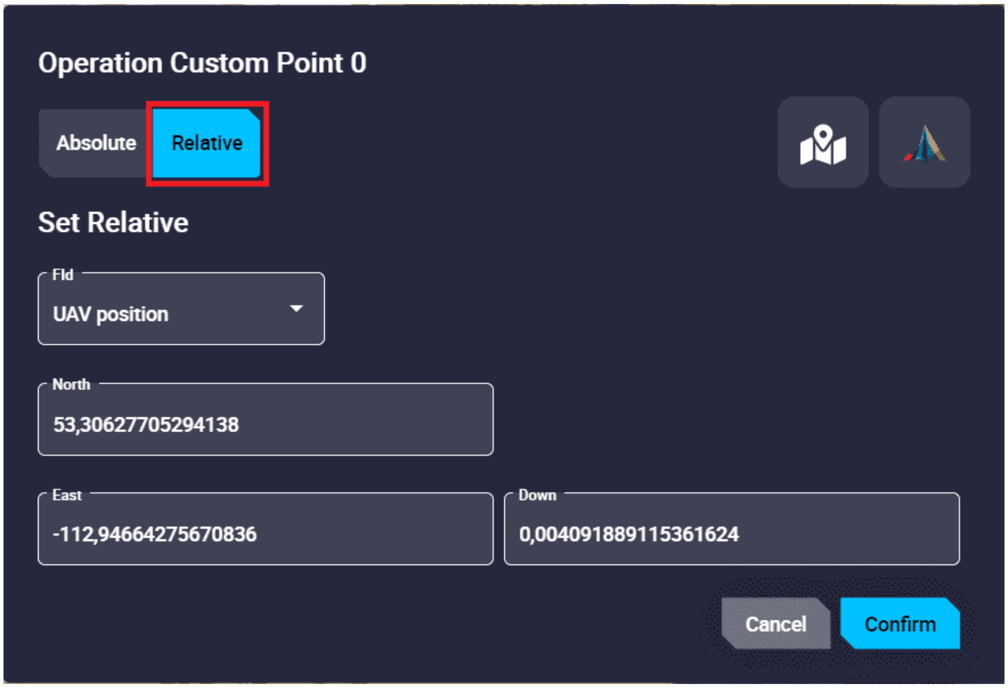
23 meters

Fig. 70: **Absolute waypoint position**

- **Set coordinates**: The coordinates can be set in:
- Decimal Degrees → Latitude (DD) and Longitude (DD)
- Degrees º ‘ ” → Latitude (DMS) and Longitude (DMS)
- UTM → x (Easting), y (Northing), Zone and Hemisphere
- MGRS (Military Grid Reference System)
- **Set elevation**: Whichever way the user defines the **altitude** (WGS84, MSL and AGL) Veronte Ops will calculate the other 2 ways. That is, if the user defines a waypoint at X m in AGL, Veronte Ops will automatically calculate what that value is in WGS84 and MSL.

∗ **Relative**: In this case, the position of the waypoint is relative to another point.

That point could be the **UAV position**, a **Desired position**, a **Track position** or an **Operation Custom Point**. They are indicated through North, East and Down.



Fld: UAV position

North: 53,30627705294138

East: -112,94664275670836

Down: 0,004091889115361624

Fig. 71: **Relative waypoint position**

- **Open elevations**: To be able to consult the elevation of the route, it is required to have installed the **Veronte Terrain Provider** application (for more information about this, see *Additional apps* section of this manual).

  Here users can see an estimate of the height of the terrain and the height of the route to be taken as well as the collisions that could occur.

  In addition, users can set up a **Warning Threshold**, which will be represented as a red warning line over the terrain. Fore more information, see *Map settings section* of this manual.

  By clicking on it, the following menu will appear:

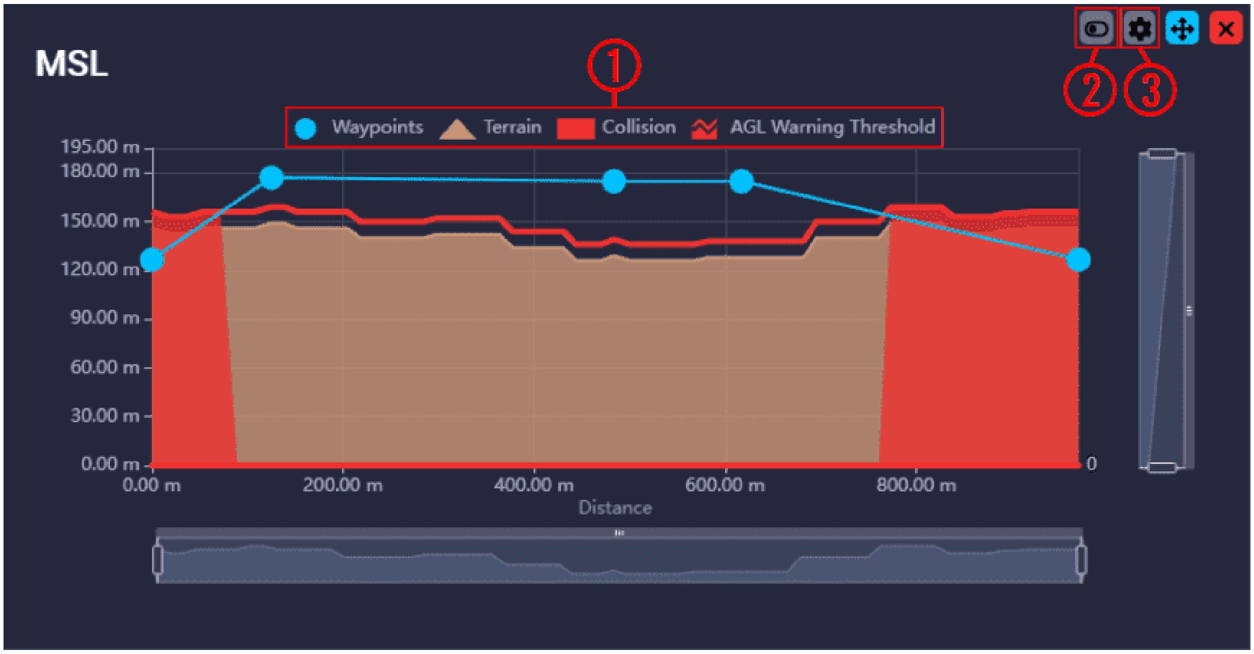


Fig. 72: **Elevation (MSL) menu**

1. This legend showing waypoints, terrain and collision is an 'interactive' legend, i.e. users can choose which of these elements are displayed or not by simply clicking on them:

Fig. 73: **Elevation (MSL) menu - Legend**

2. **Drag** button: When enabled (●), users can modify the altitude of the waypoints by simply clicking and dragging them. If it is disabled (○), it is not possible to move them:

Fig. 74: **Elevation (MSL) menu - Dragging waypoints**

3. **Settings** button: Displays a new window with some parameters that can be customized:

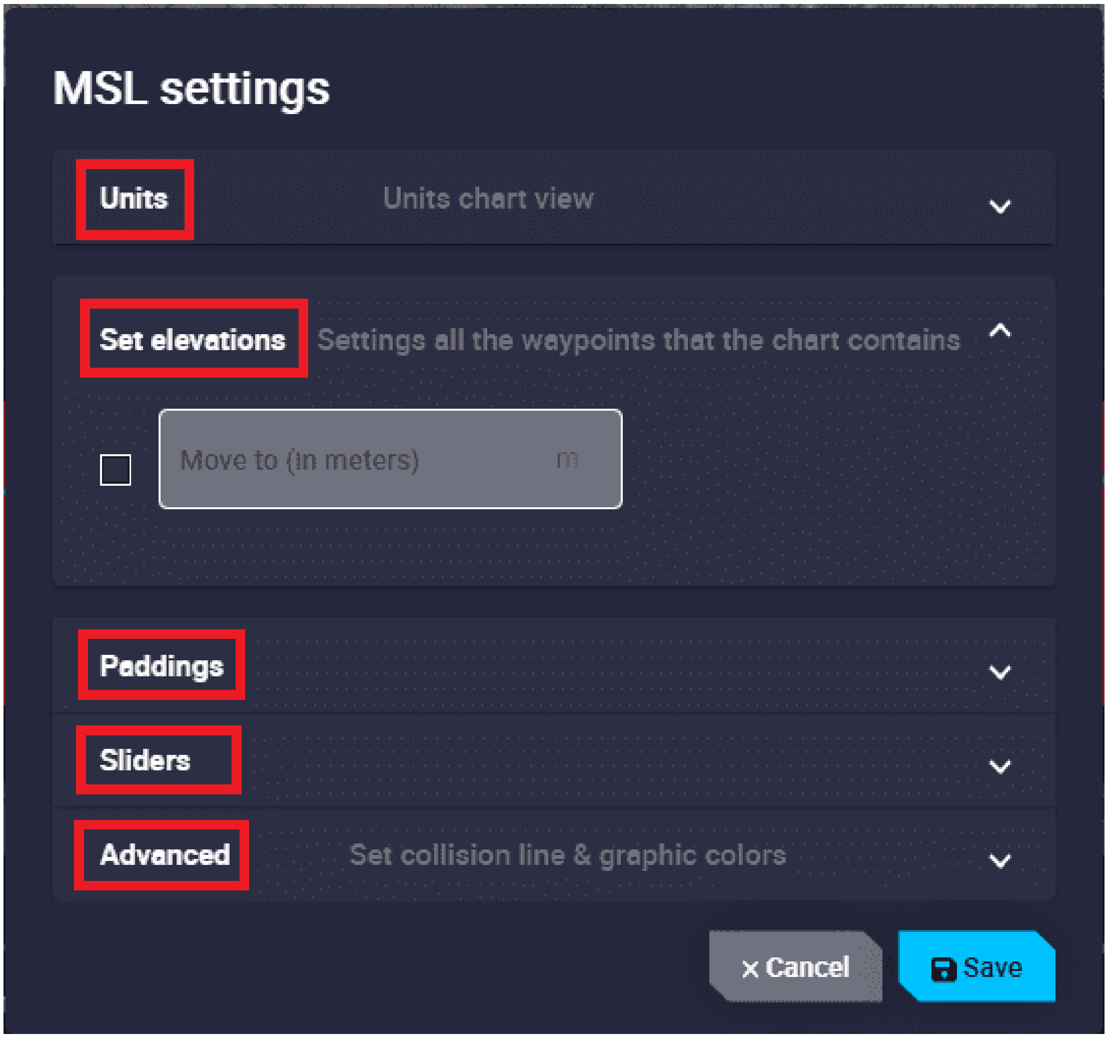
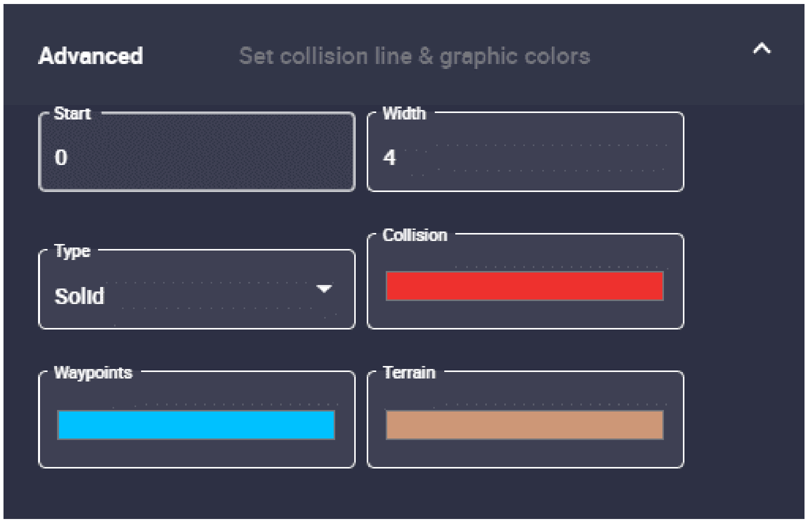


Fig. 75: **Open elevation menu - Settings**

- **Units**: Units of the elevation and distance of the chart view can be set.
- **Set elevations**: The altitude of all waypoints on the route can be modified.
- **Paddings**: The size of the grid can be adjusted as desired.
- **Sliders**: X and Y axis sliders can be hidden by disabling them.
- **Advanced**: The collision line and chart colors can be modified:



Advanced Set collision line & graphic colors

Start: 0

Width: 4

Type: Solid

Collision: 🟥

Waypoints

Terrain

Fig. 76: **Elevation (MSL) menu - Advanced settings**

3.2.1.2 Segment

To create a new segment, click on the segment icon and then select on the map the point where the segment will start. To end the track, users have 2 options:

- **Double click** directly with the **left mouse button** will create the last waypoint of the segment.
- After creating the last waypoint, **right-click on the map** to close/finish the 'creation event'.

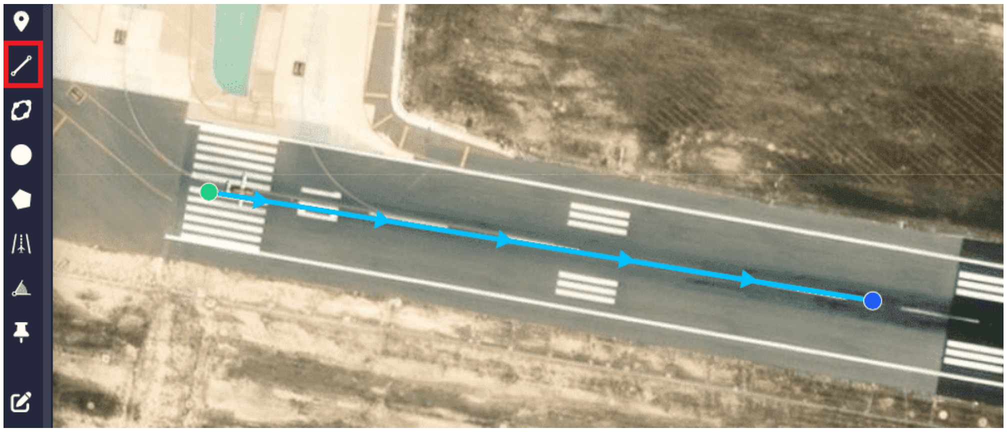


Fig. 77: **Segment**

In addition, users can **concatenate two or more segments** by clicking on various points on the map with the **left button**, as shown in the figure below:

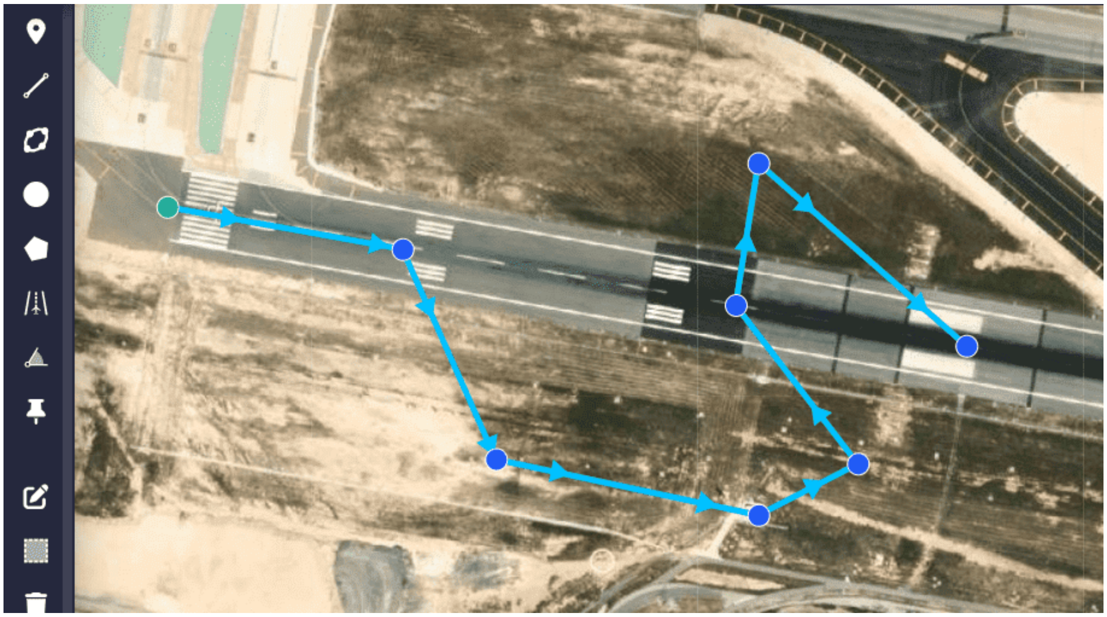


Fig. 78: **Route**

Besides, to create a closed route, users must match the last waypoint of the segment with the first one:

Fig. 79: **Closed route**

It is also possibe to curve a segment. To do so, users must create the segment, edit the mission by clicking on the ✎ icon, and then move the **translucent orange waypoint** (●) in the centre of the segment. The distance moved will correspond to the radius of the curve:

Fig. 80: **Curve segment**

There is an extra option in the options for a waypoint that corresponds to the start of a curved segment:

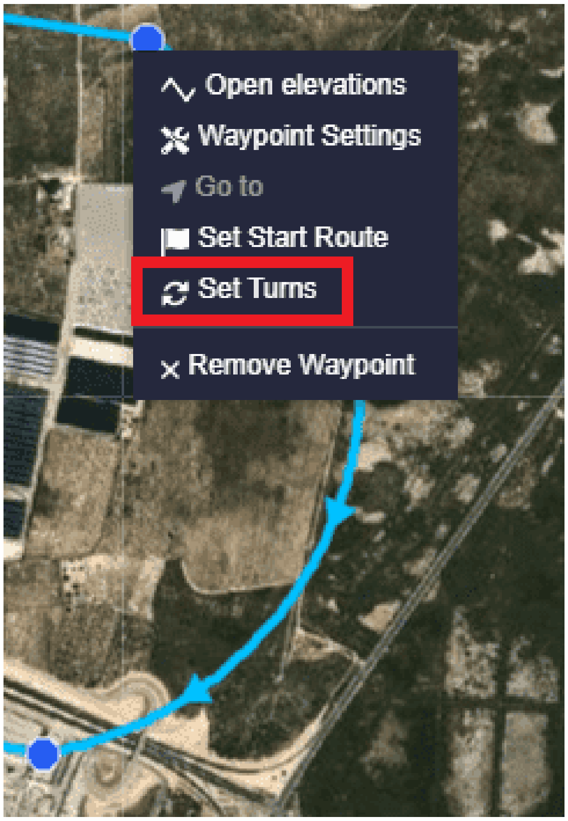


Fig. 81: **Curve segment options**

- **Set Turns**: This option allows the user to set a desired number of turns. After these turns the platform will continue with the defined mission. An example is shown below:

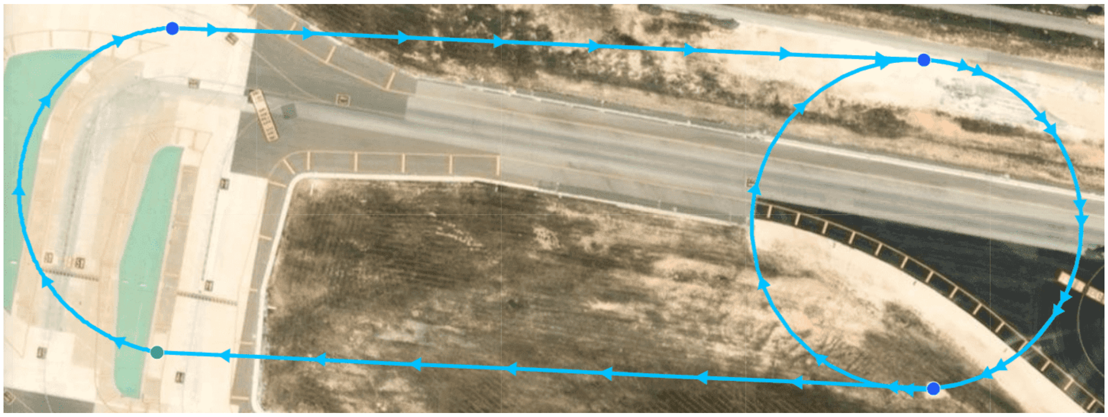


Fig. 82: **Curve segment - Turns**

> **Warning:** When a segment is created, be careful with the height of the waypoints.
>
> Users can **check for collisions** between route waypoints and terrain **directly on the map** or **using the 'Open elevations' functionality** described above.

To check directly on the map, if some of the waypoints are below the terrain altitude indicated by the meshes, the affected segment will change its color to red. To solve this, change the altitude of the waypoints. An example is shown below:

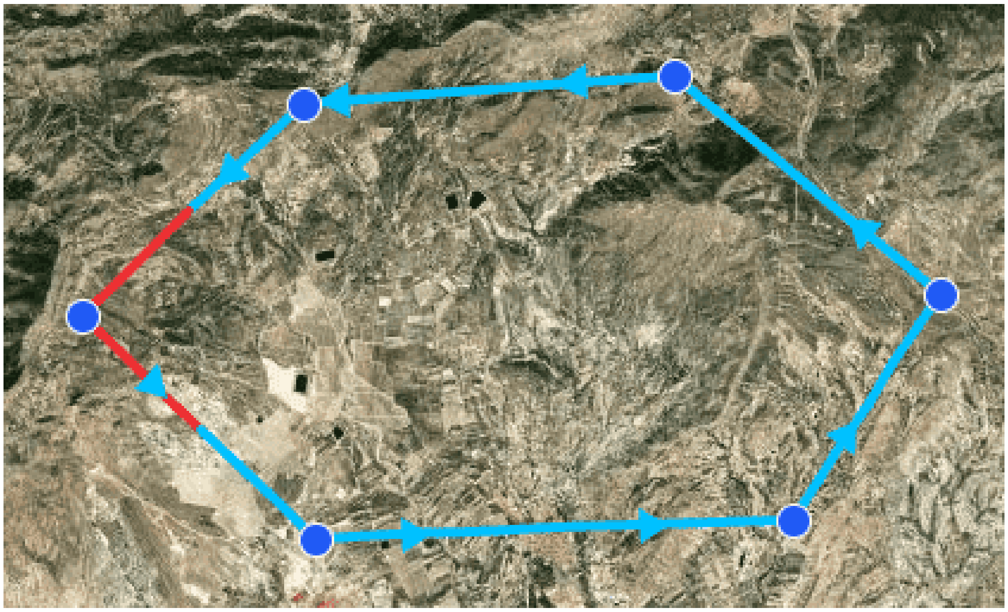


Fig. 83: **Segment under the ground altitude**

3.2.1.3 Orbit

This tool allows the user to create a new orbit on the map.

First, select a point on the map which will be the center of the new orbit. Then, when users have created all the desired orbits, **right-click on the map** to close/finish the ‘creation event’.

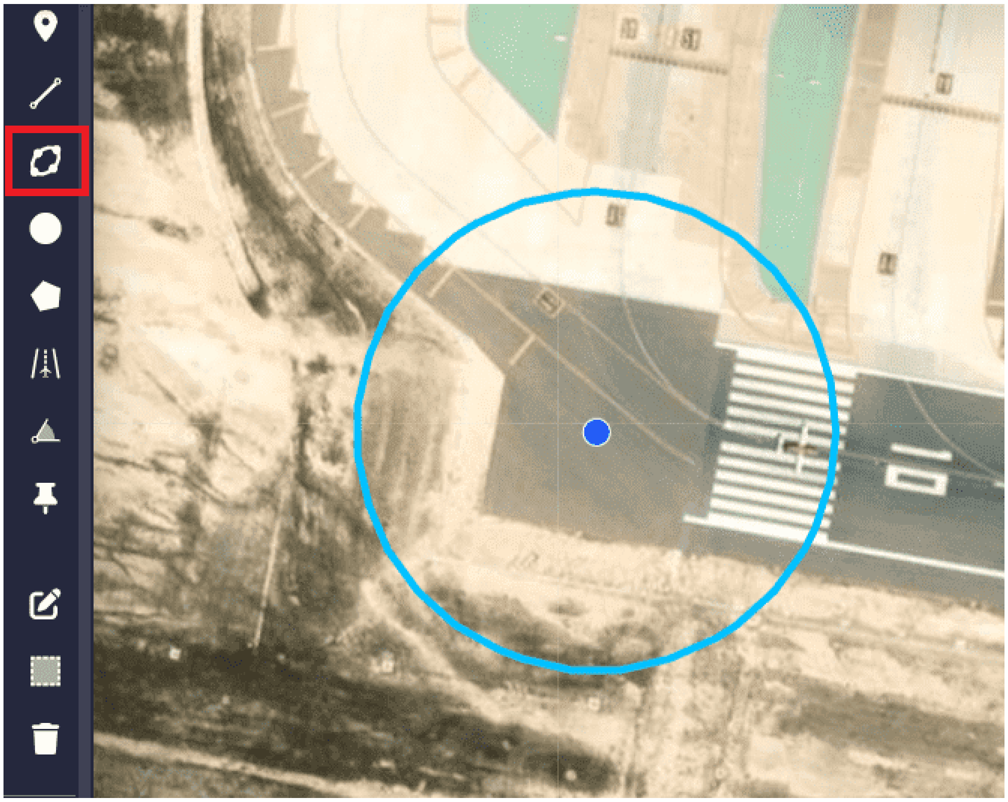


Fig. 84: **Orbit**

In addition, the initial circular orbit can be converted into an ellipse by modifying the length of the axes and can also be rotated. To do this, edit the mission by clicking on the ✎ icon, then move the **4 translucent orange waypoints** (●) as desired to turn them into an ellipse and to rotate it, click and rotate the small blue circle (◉):

Fig. 85: **Ellipse orbit**

Besides, there is an extra option in orbits regarding waypoints and segments:

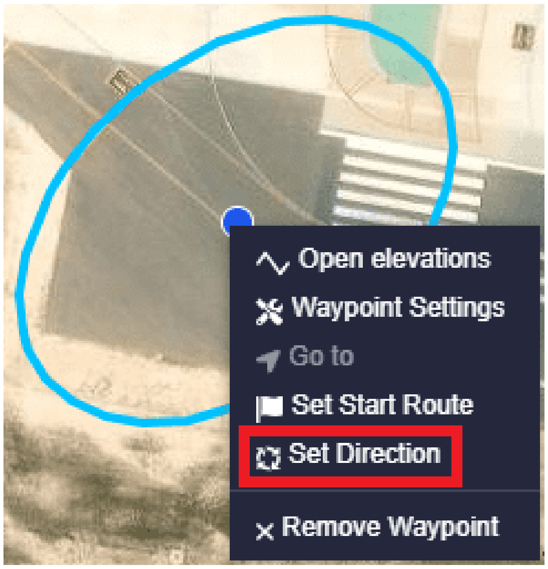


Fig. 86: **Orbit options**

- **Set Direction**: It is possible to select the direction of the loiter: **Auto**, **Clockwise** and **Anticlockwise**.

Warning: When creating an orbit, be careful with its altitude and the ground level (all the points of the orbit will be at the same altitude).

Users can **check for collisions** between orbit and terrain **directly on the map** or **using the 'Open elevations' functionality** described above.

To check this directly on the map, if any part of the orbit is below the terrain altitude indicated by the meshes, the affected segment will change its color to red. To solve this, change the altitude of the waypoint.

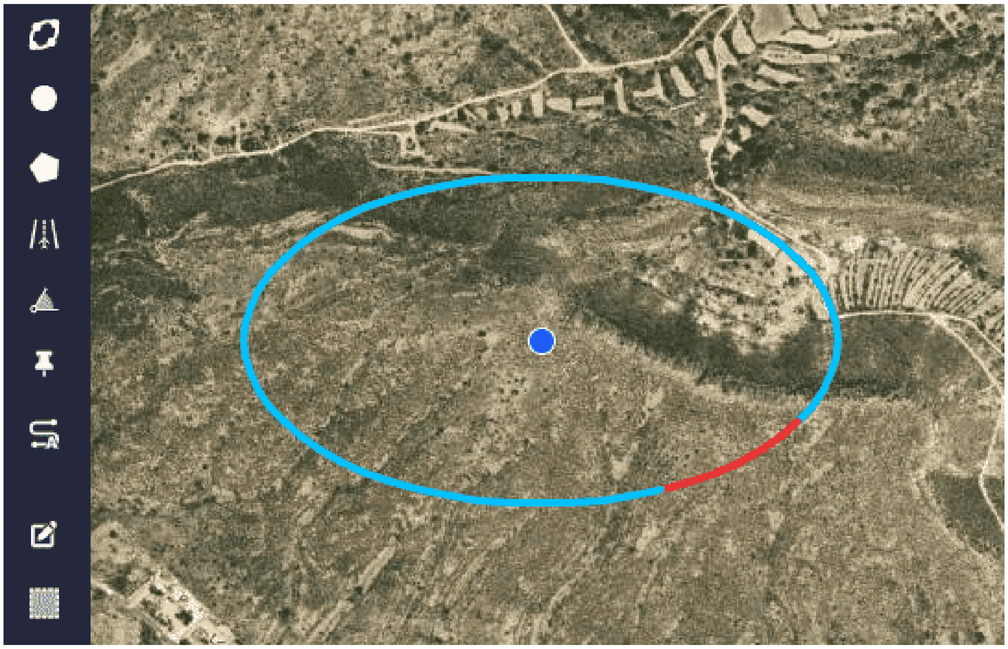


Fig. 87: **Orbit partially below ground level**

3.2.1.4 ● Circle

This tool is used to determinate an area in which an action is wanted to be performed. When the aircraft enters or leaves the circle an event may be triggered and it can be used to start an automation.

Note: The linking of a circular area to an automation is done in the **Operation panel**, for more information about this, see *Operation panel* section of this manual.

To add a circle, click on its icon, click on the desired point on the map and drag it to set the radius. Then, when users have created all the desired circles, **right-click on the map** to close/finish the 'creation event'.

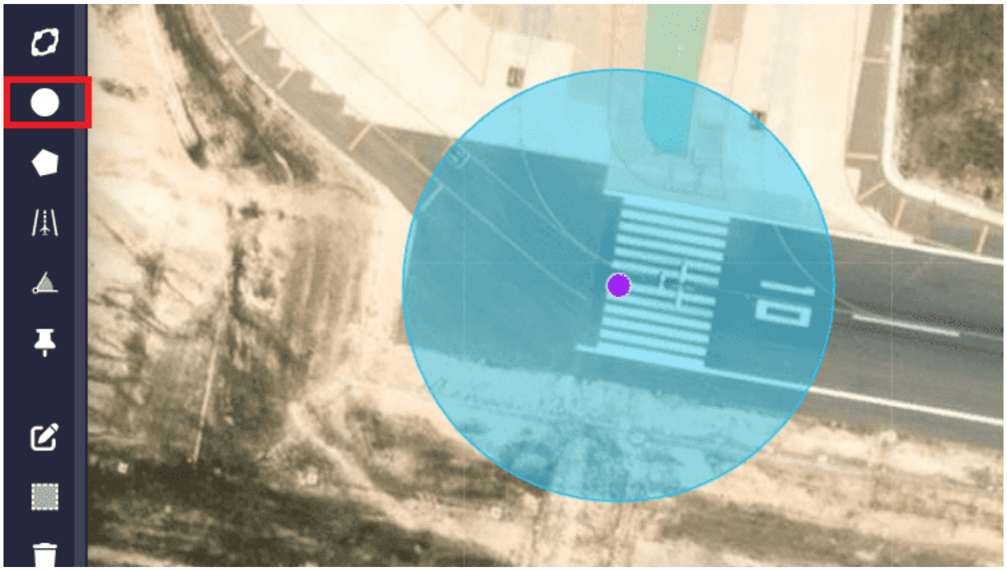


Fig. 88: **Circle**

Like all other elements, it can be edited to move it or change its radius by clicking on the ✎ icon:

Fig. 89: **Circle radius**

Right-clicking on the circle, users will access to its **options**:

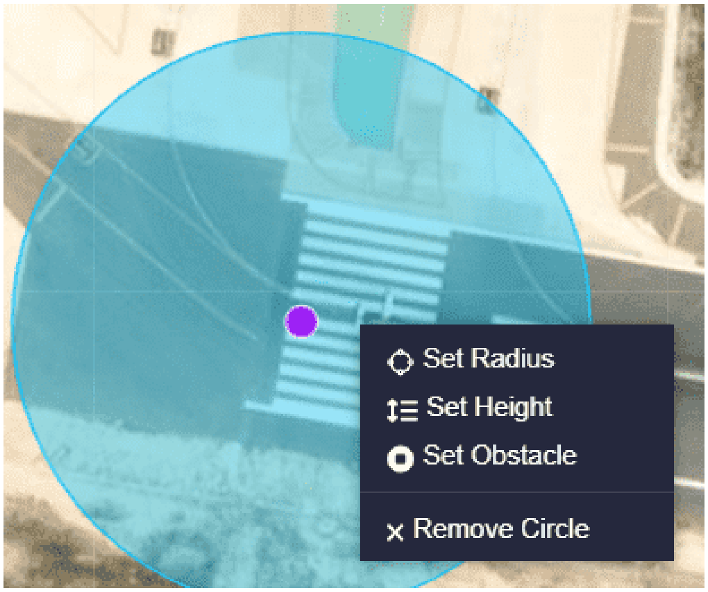
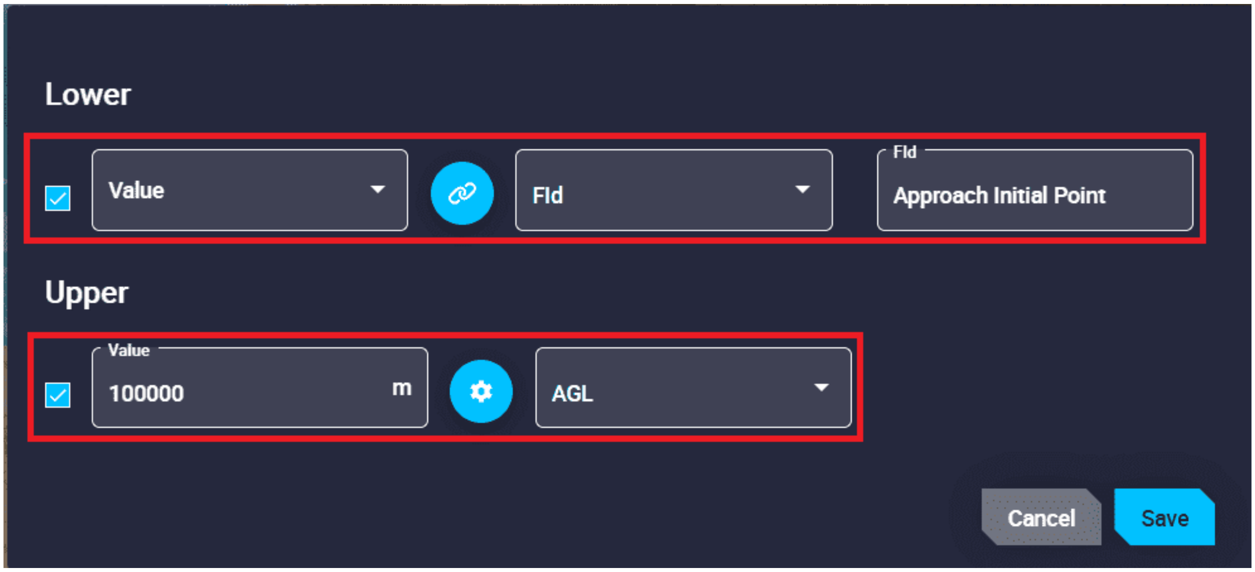


Fig. 90: **Circle options**

- **Set Radius**: To accurately set the radius of the circle, users can enter the value manually.
- **Set Height**: Users can set the upper and lower heights of the circular area. By default, circular areas have infinite lower and upper boundaries.


Lower

☑ Value | Fld | Fld: Approach Initial Point

Upper

☑ Value: 100000 m | AGL

Fig. 91: **Circle options - Set Height**

As can be seen in the figure above, the lower and upper limits can be set as absolute or relative:

  - **Relative** 🔗 icon: The altitude is relative to a **Operation Variable**, previously defined in **1x PDI Builder**. But, it is required to set the value of the variable in the *Operation Variables* of the **Operation panel**.

    In addition, it is necessary to establish whether it is relative to AGL, MSL, WGS84 or to a Fld (feature) that has to be selected.

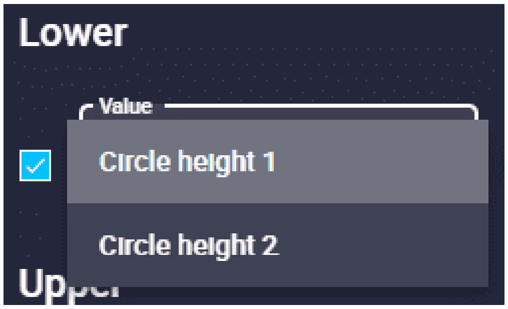
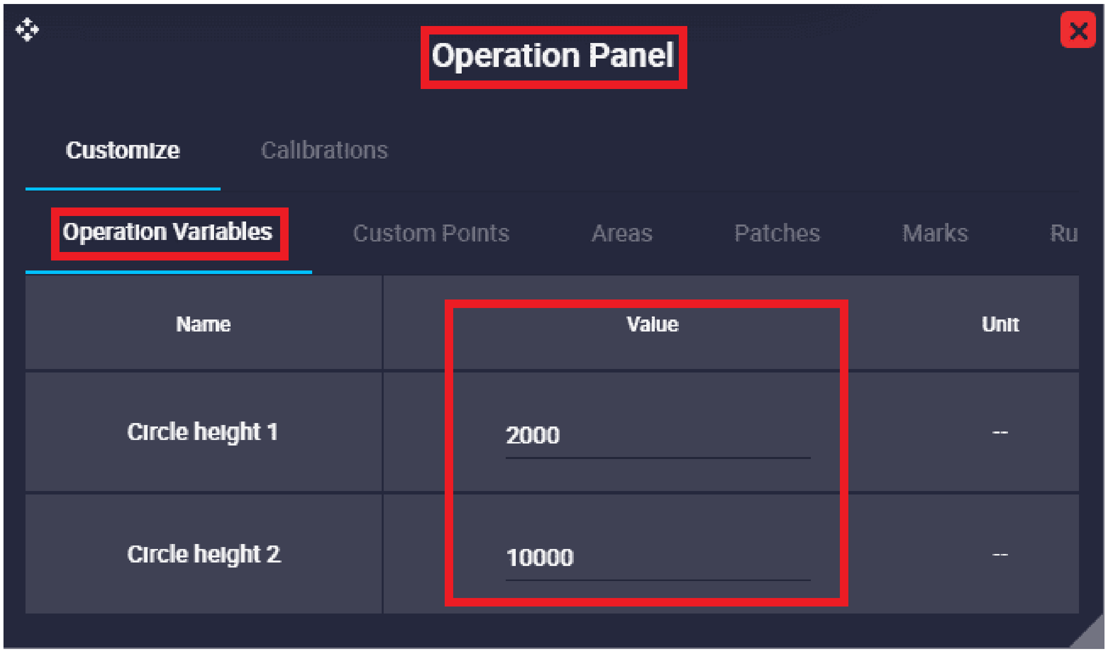


Fig. 92: **Circle options - Height relative**



Name	Value	Unit
Circle height 1	2000	--
Circle height 2	10000	--

Fig. 93: **Circle options - Operation panel**

  - **Absolute** icon: The value must be entered manually and it is also necessary to establish whether it is relative to AGL, MSL, WGS84 or to a Fld (feature) that has to be selected.

- **Set Obstacle**: A circle can become an obstacle, an area that is desired to avoid.

Fig. 94: **Circle options - Set Obstacle**

This tool permits to set an exclusion area on the map that can not be crossed by the RPAS. Main functions of the tool:

  - Avoid collisions with obstacles as for example buildings, trees or antenna towers.
  - Avoid flying restricted access areas.

What can happen with high speed aircrafts (Airplanes)? It is possible that due to its speed, the RPAS will enter the obstacle area, but will immediately apply the corrections to exit the obstacle area and return to the path. The solutions to this problem is to configure a bigger obstacle area in order to avoid the physical obstacle

What can happen with mow speed aircrafts (Multirotor)? It can happen that a multirotor enter an obstacle area (staying very close to its center), at that moment the *Ground Speed Vector* and the *Field Repulsion Vector* have the same direction but opposite sign. This phenomenon causes a conflict and until the directions are different enough to allow the multirotor to move, it will remain in an indecision situation. To solve this problem the user can configure the obstacle area by leaving the centre of the obstacle away from the path line.

There are some options available for each obstacle by right-cliking on it:

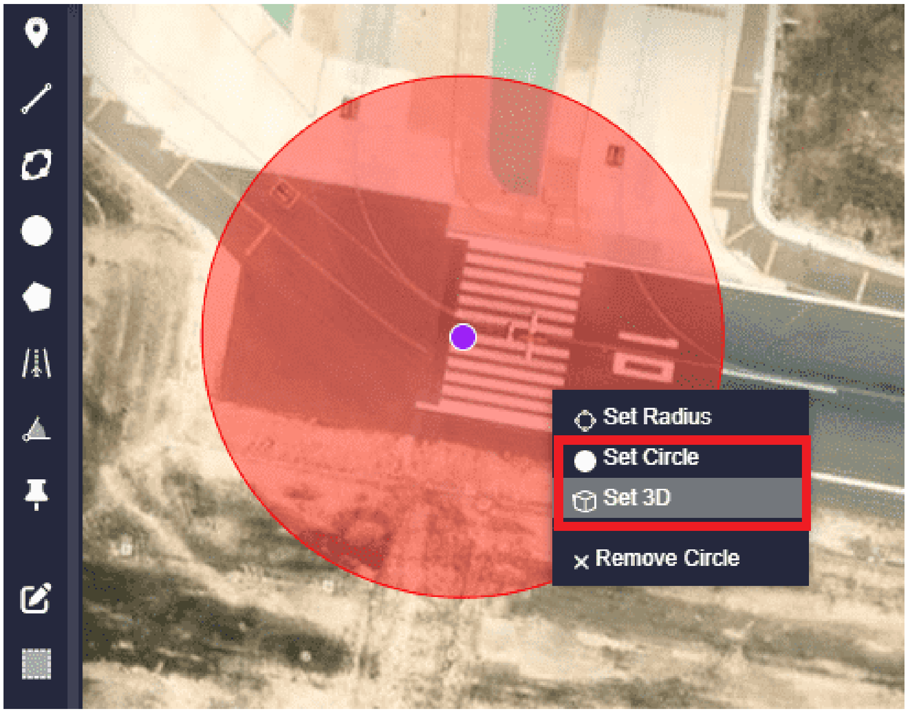


Fig. 95: **Cicle options - Obstacle options**

  - **Set 3D**: This option allows the aircraft to avoid an obstacle by passing over it, taking into account the height of the obstacle.
  - **Set 2D**: This option only takes into account 2 dimensions for the obstacle. Therefore, the platform will not be able to avoid the obstacle passing over it.
  - **Set circle**: Turns the obstacle back into a circular area.
- **Remove Circle**: Deletes the circle.

3.2.1.5 Polygon

The way it works is very similar to **Circle**, described above.

This tool is used to determinate an area in which an action is wanted to be performed. When the aircraft enters or leaves the polygon an event may be triggered and it can be used to start an automation.

Note: The linking of a polygonal area to an automation is done in the **Operation panel**, for more information about this, see *Operation panel* section of this manual.

To add a polygon, click on its icon, click on the desired points on the map and match the last waypoint of the polygon with the first one. Then, when users have created all the desired polygons, **right-click on the map** to close/finish the ‘creation event’.

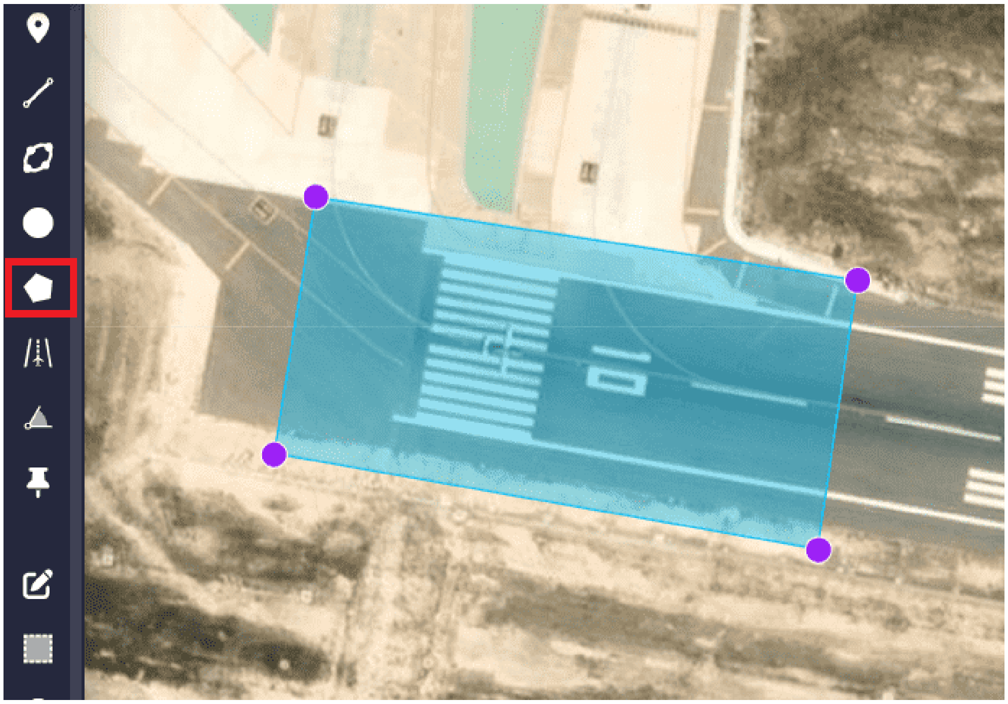


Fig. 96: **Polygon**

Like the other elements, it can be edited to change its shape by moving its vertices. Click on the ✎ icon:

Fig. 97: **Polygon shape**

Right-clicking on the polygon, users will access to its **options**:

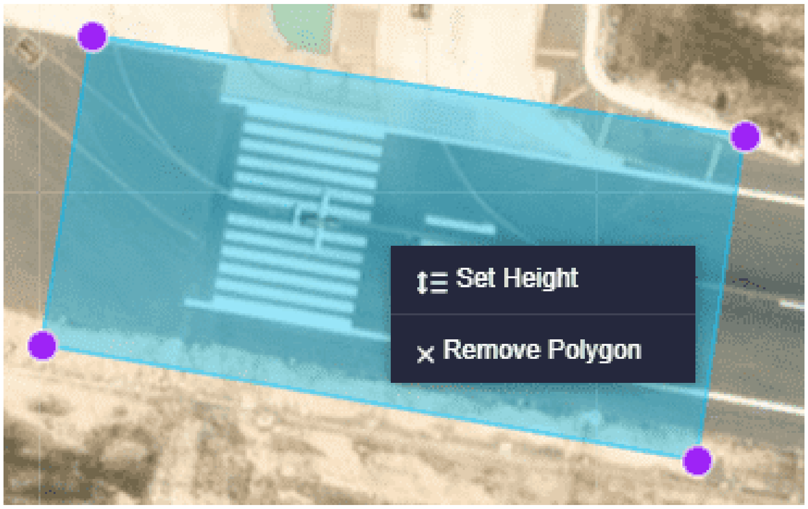


Fig. 98: **Polygon options**

- **Set height**: Users can set the upper and lower heights of the polygonal area. By default, polygonal areas have infinite lower and upper boundaries. It works in the same way as in the *circular areas*, described above.
- **Remove polygon**: Deletes the polygon.

3.2.1.6 Runway

This option allows the user to configure a **Runway** which is used during flight phases.

To add a runway, click on its icon, click on a point on the map to define the start and click on a second point to define the end of the runway.

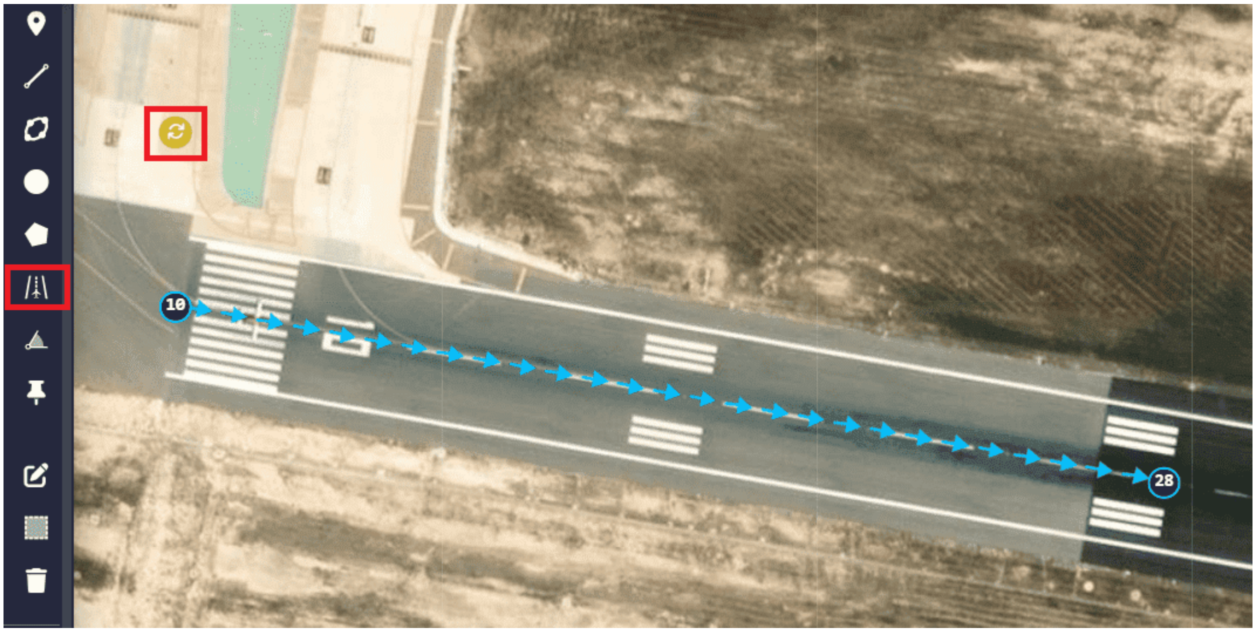


Fig. 99: **Runway**

Note: The loiter position is automatically defined and it is identified by this icon: , as can be seen in the image above.

By accessing the *mission edition* (icon) it is possible to modify the position of the start and end points of the runway, as well as the position of the loiter point:

Fig. 100: **Runway position**

Right-clicking on the start or end point of the runway, users will access to its **options**:

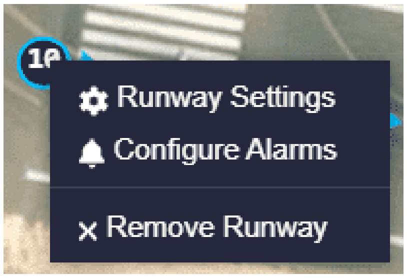
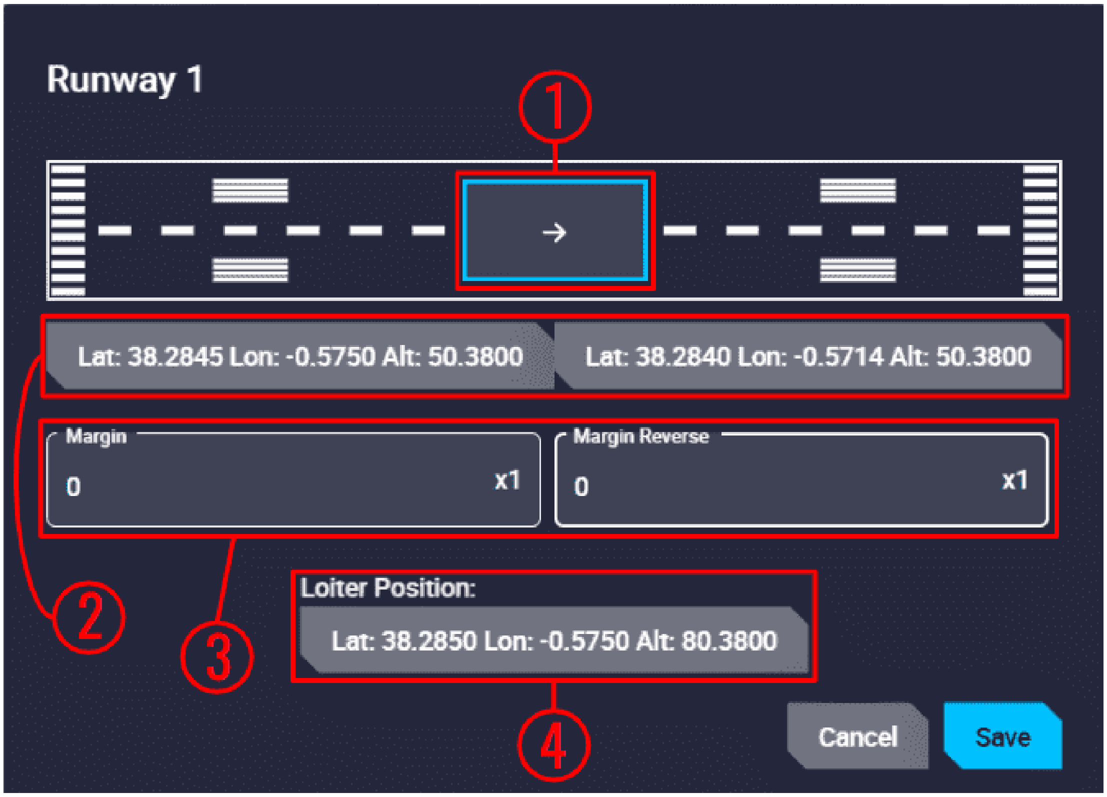


Fig. 101: **Runway options**

- **Runway Settings**: The following parameters can be configured:



Lat: 38.2845 Lon: -0.5750 Alt: 50.3800

Lat: 38.2840 Lon: -0.5714 Alt: 50.3800

Margin: 0 x1

Margin Reverse: 0 x1

Loiter Position:

Lat: 38.2850 Lon: -0.5750 Alt: 80.3800

Fig. 102: **Runway options - Settings**

1. **Runway direction**: The direction of the runway is defined here with an arrow.

   By default it is →, but user can define it as desired clicking on it. The available options are →, ← and **AUTO**.

   Note: When the **AUTO** option is selected, the runway direction will be defined by the **wind direction**.

   ---

2. **Runway coordinates**: The user can manually introduce the coordinates of the start and end point of the runway. Its configuration is the same as for a waypoint (a detailed explanation of this has been described in the *Waypoint* section).
3. **Margin/Margin Reverse**: Percentage of the runway distance at which the airplane will try to touch the ground.
4. **Loiter Position**: To accurately define the loiter point of reference (**Runway Loiter**), its coordinates and the altitude that the aircraft will reach during climb, can be defined in this option.

   Its configuration is the same as for a waypoint (a detailed explanation of this has been described in the *Waypoint* section).

- **Configure Alarms**: When an alarm is selected, the aircraft shall perform the actions associated to that alarm on the selected runway.

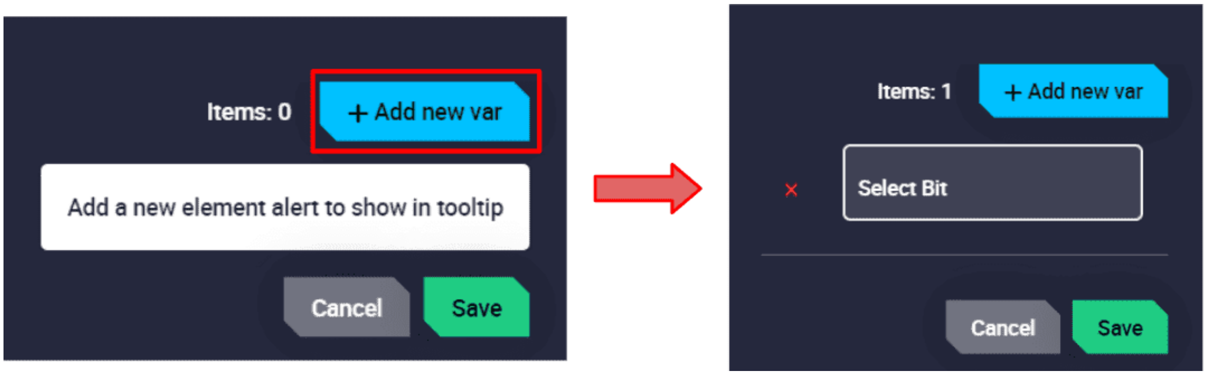


Fig. 103: **Runway options - Configure Alarms**

Alarms are configured with bit variables, users can select any bit they want.

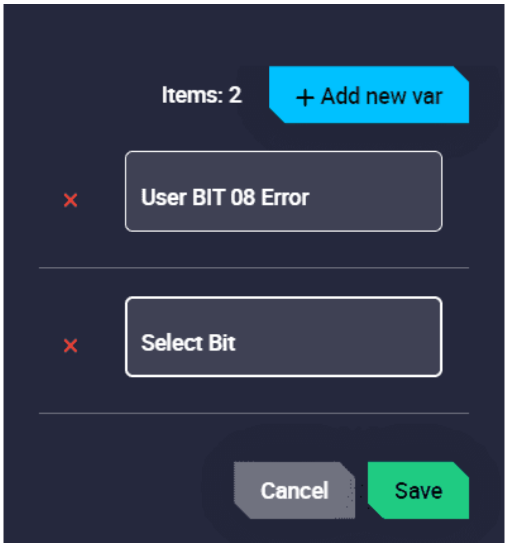


Fig. 104: **Runway options - Alarms**

- **Remove Runway**: Deletes the runway.

3.2.1.7 Spot

This option allows the user to configure a **Spot** which is used during flight phases. A spot refers to a kind of runway where a initial point and its azimuth is defined. Besides, it is necessary to define a delta angle.

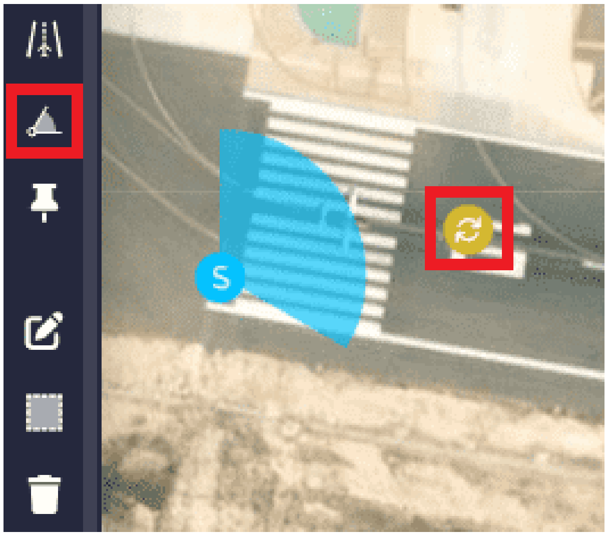


Fig. 105: **Spot**

Note: The loiter position is automatically defined and it is identified by this icon: , as can be seen in the image above.

By accessing the *mission edition* (icon) it is possible to modify the **position**, **azimuth** and **delta** of the ‘spot’ and also the position of the loiter point:

Fig. 106: **Spot position**

Right-clicking on the ‘spot’ point, users will access to its **options**:

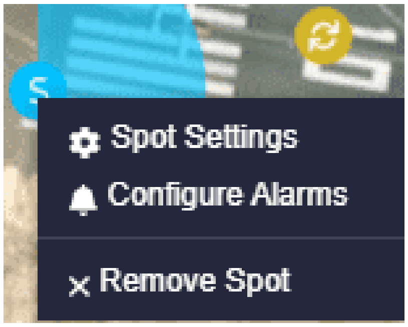
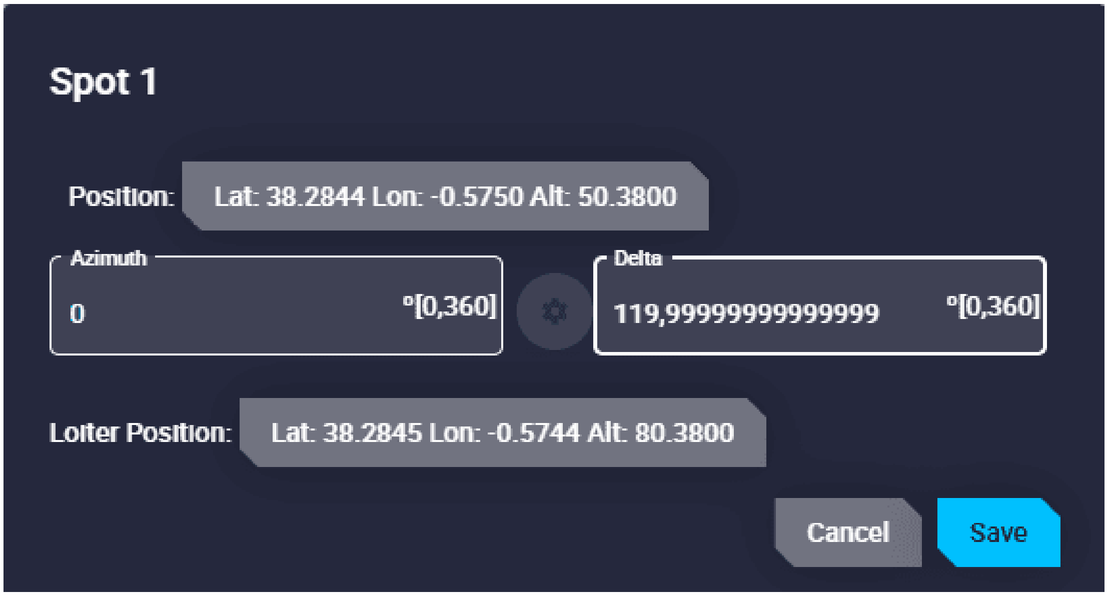


Fig. 107: **Spot options**

- **Spot Settings**: The aircraft will land or take-off using the best orientation computed within the area bounded by the parameters entered here:



Spot 1

Position: Lat: 38.2844 Lon: -0.5750 Alt: 50.3800

Azimuth: 0 º[0,360]

Delta: 119,99999999999999 º[0,360]

Loiter Position: Lat: 38.2845 Lon: -0.5744 Alt: 80.3800

Fig. 108: **Spot options - Settings**

  - **Position**: The user can manually introduce the coordinates of the ‘spot’ point. Its configuration is the same as for a waypoint (a detailed explanation of this has been described in the *Waypoint* section).
  - **Azimuth and Delta**: Users must configure the desired **azimuth** and **delta** for the spot. The units available for these angular values are $[0, 360]$, **º ‘ ”** , rad, $rad[0, 2\pi]$, , $rad[-\pi, \pi]$ and $[-180, 180]$.

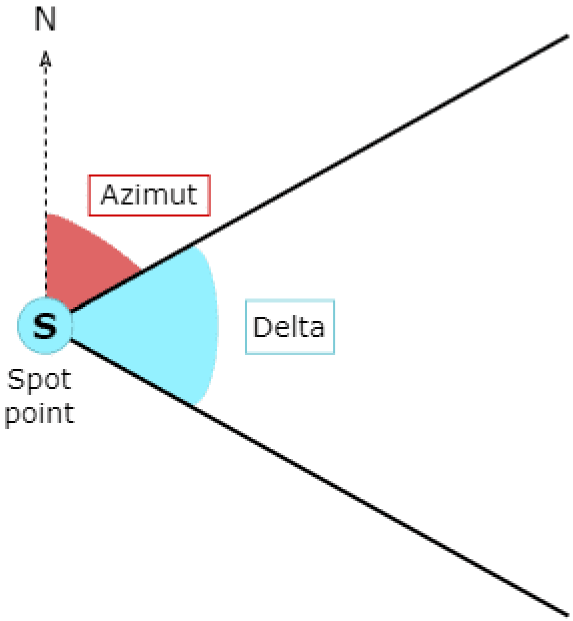


Fig. 109: **Spot parameters**

  - **Loiter Position**: To accurately define the loiter point of reference (**Spot Loiter**), its coordinates and the altitude can be defined in this option.

    Its configuration is the same as for a waypoint (a detailed explanation of this has been described in the *Waypoint* section).

- **Configure Alarms**: When an alarm is selected, the aircraft shall perform the actions associated to that alarm on the selected spot. It is configured in the same way as *runways*, described above.
- **Remove Spot**: Deletes the spot.

3.2.1.8 Marks

This tool allows to set an event mark on a patch. Marks are useful to initiating automations. When the aircraft flies over it, an event is triggered and can be used as a condition to start a set of actions: add a lap to a counter, payload launch, take a photo, start video recording, etc.

Note: The linking of a mark to an automation is done in the **Operation panel**, for more information about this, see *Operation panel* section of this manual.

To place a mark, it is **first required to create a patch**. The elements described above that are patches are **waypoints**, **segments** and **orbits**. To add it, select the tool and click on the desired patch. Then, when users have created all the desired marks, **right-click on the map** to close/finish the 'creation event'.

Initially, new marks appear as a pin ( ). If the user links an event to one of them, the icon selected for this event will be displayed.

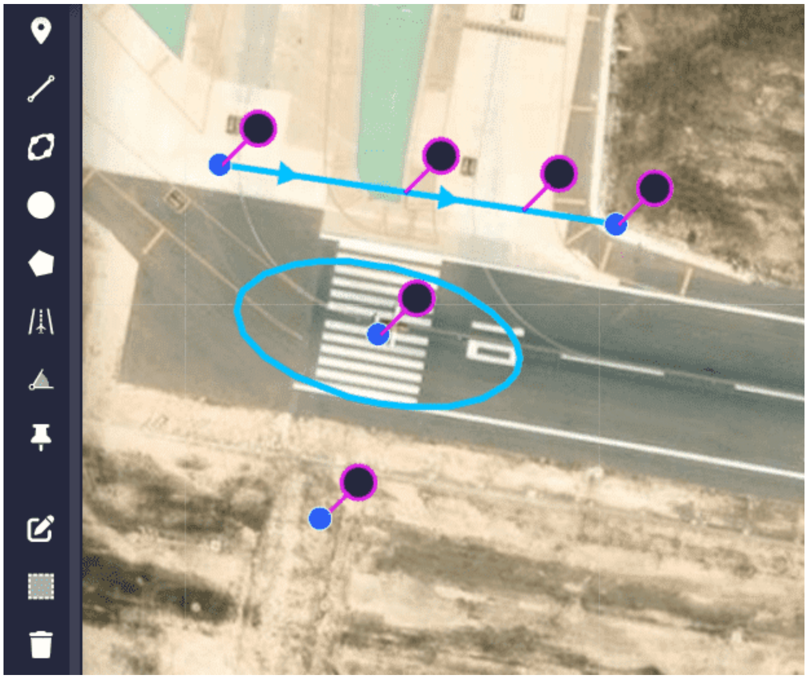


Fig. 110: **Mark**

Marks can be moved along the patch by clicking on the ✎ icon:

Note: A mark can only be displaced if it is in a segment.

Fig. 111: **Marks moved**

Right-clicking on the mark, users will access to its **options**:

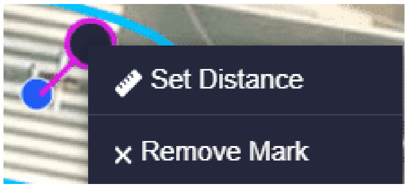


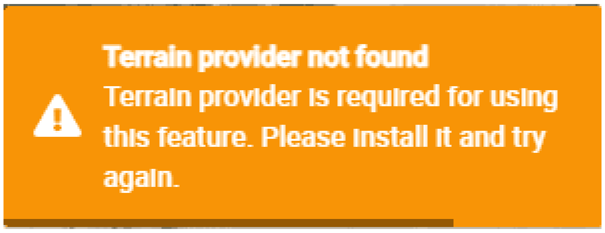
Fig. 112: **Mark options**

- **Set Distance**: This distance is the horizontal distance along the patch to the starting waypoint. If the mark is attached to a waypoint, distance will be zero.
- **Remove Mark**: Deletes the mark.

3.2.1.9 Generate route

To be able to create these elements, it is first necessary to have the application *Veronte Terrain Provider* running.

If this tool is not initialised, the following warning message will appear when trying to use the two 'Generate Route' tools:



Terrain provider not found
Terrain provider is required for using this feature. Please install it and try again.

Fig. 113: **Generate route warning message**

- **Spiral**

  Spiral tool draws a spiral that can cover a target area.

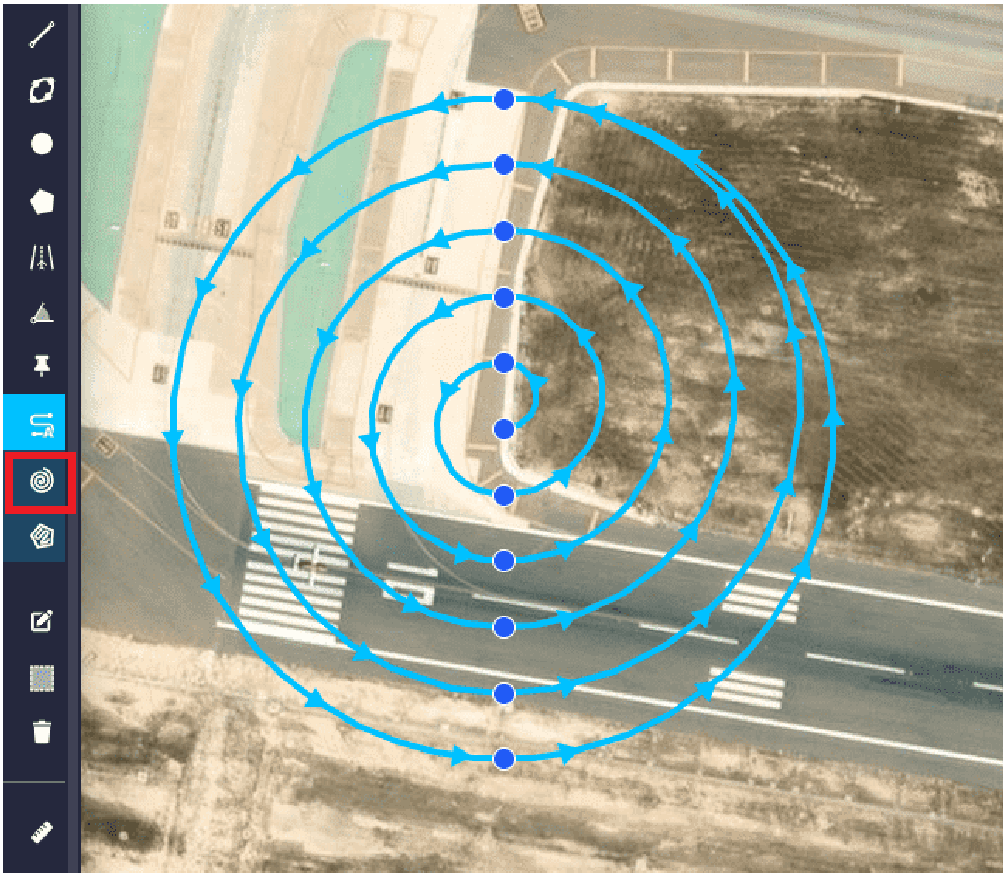


Fig. 114: **Generate route - Spiral**

The spiral options are accessed in the same way as for the other elements described above, and are the same as the *waypoint* options. However, by **clicking on the central waypoint of the spiral**, an extra option appears that allows the user to access the '**Spiral Settings**':

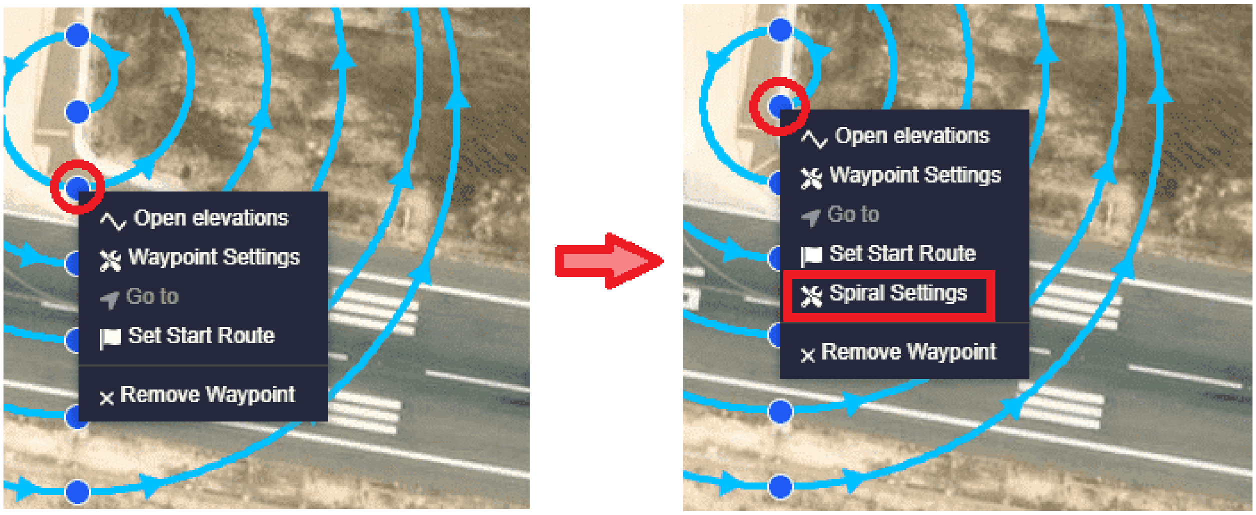
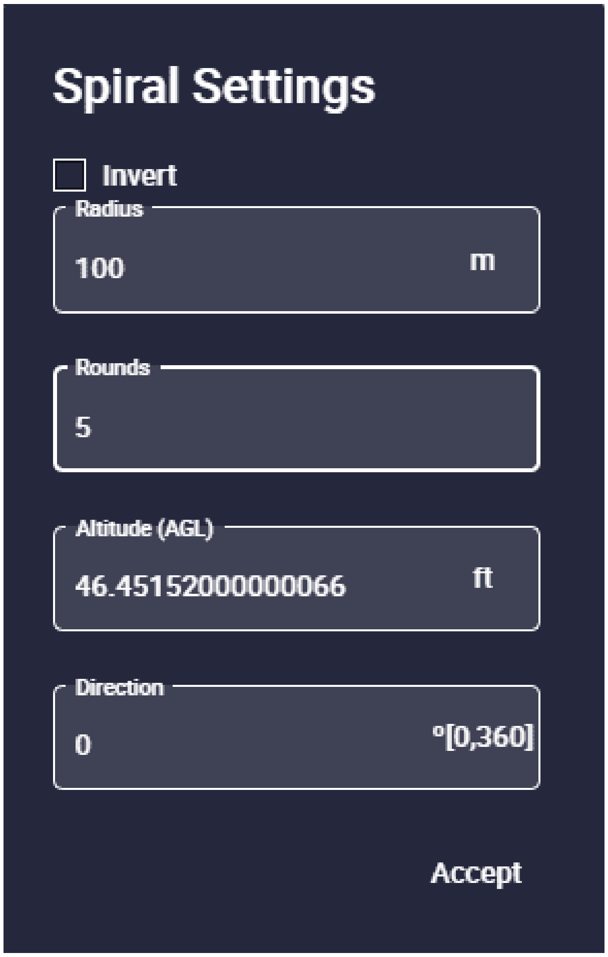


Fig. 115: **Generate route - Spiral options**



Spiral Settings

☐ Invert

Radius: 100 m

Rounds: 5

Altitude (AGL): 46.45152000000066 ft

Direction: 0 °[0,360]

Fig. 116: **Generate route - Spiral Settings**

> **Warning:** If the user 'refreshes' **Veronte Ops**, it will no longer be possible to access this configuration menu.
>
> In addition, the spiral will act as a *curved segment* and will have the same options like this one.

The following parameters can be configured:

- **Invert**: When enabled, the direction of the route will be the opposite to the direction configured below.
- **Radius**: Spiral maximum radius.
- **Rounds**: The number of spiral rounds.
- **Altitude (AGL)**: Altitude of the waypoints expressed in **AGL**.
- **Direction**: Direction of the spiral axes on the map.

- **Photogrammetry Polygon**

Polygon tool allows users to draw a polygon on the map to **automatically generate a mapping mission**.

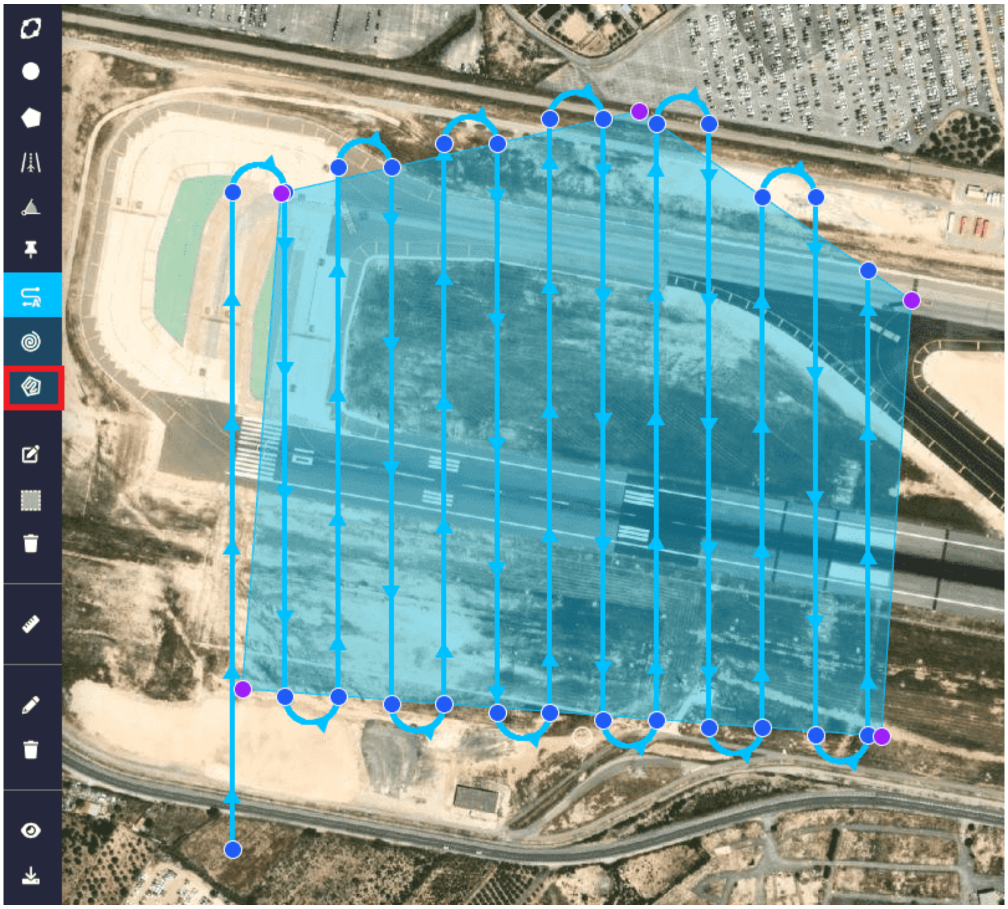


Fig. 117: **Generate route - Polygon**

The polygon options are accessed in the same way and are the same as for a 'normal' polygon (see *Polygon section*, for more information). However, an extra option appears that allows the user to access the '**Photogrammetry Settings**' (Route Settings):

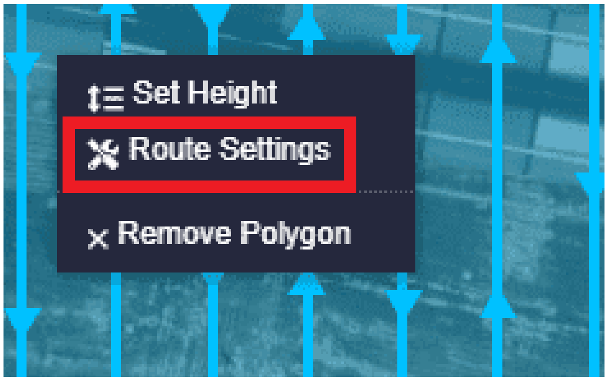
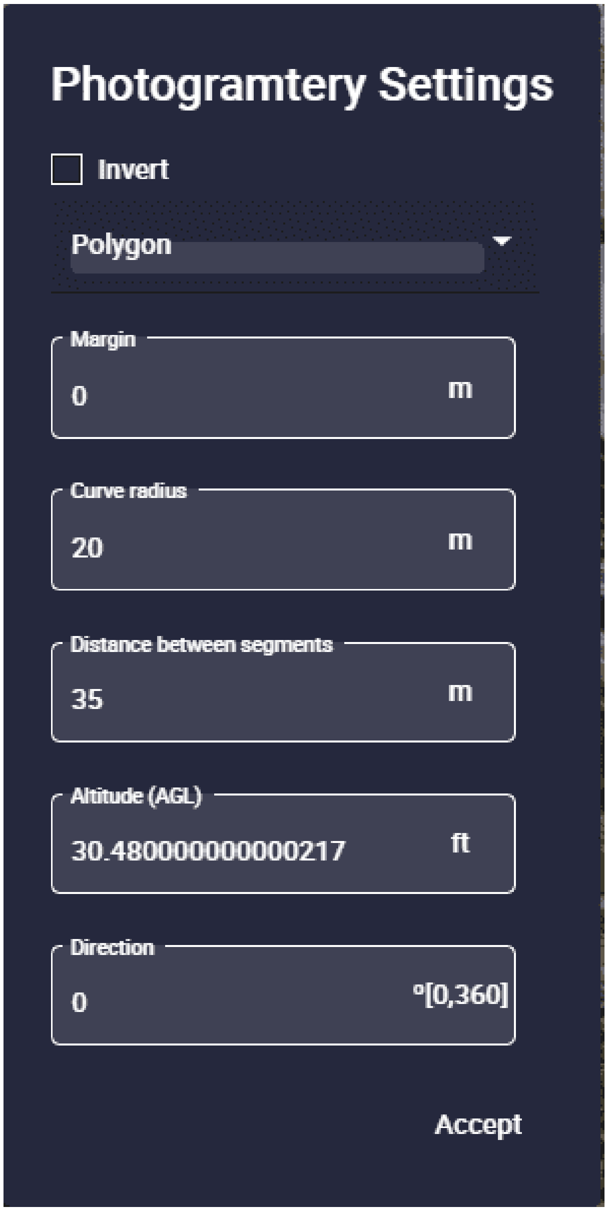


Fig. 118: **Generate route - Polygon options**



Photogramtery Settings

☐ Invert

Polygon

Margin: 0 m

Curve radius: 20 m

Distance between segments: 35 m

Altitude (AGL): 30.480000000000217 ft

Direction: 0 º[0,360]

Fig. 119: **Generate route - Photogrammetry Settings**

> **Warning:** If the user 'refreshes' Veronte Ops, it will no longer be possible to access this configuration menu. Therefore, photogrammetry polygon will act as a "normal" polygon.

The following parameters can be configured:

- **Invert**: When enabled, the direction of the route will be the opposite to the direction configured below.
- **Polygon**: As with 'normal' polygons, users can link a predefined polygon to this photogrammetry polygon in the **Operation panel**. For more information about this, see *Operation panel* section of this manual.

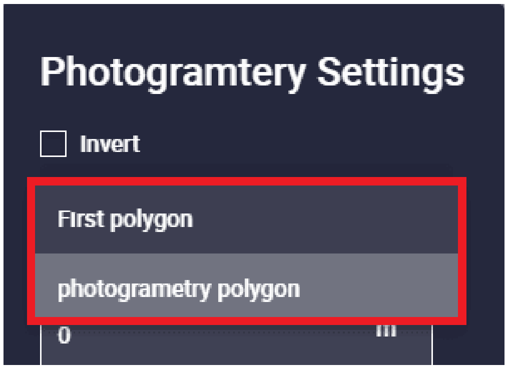


Fig. 120: **Generate route - Photogrammetry Settings polygon**

- **Margin**: This option allows the user to add boundary margins for the route to each side of the polygon.
- **Curve radius**: Radius of the route turns.
- **Distance between segments**: Distance between segments can be modified.

> **Note:** Depending on the **curve radius** value and the **distance between segments**, there are three cases for this part of the route (the radius must be set according to the minimum achievable by the platform):
>
> - Radius **0** ⇒ There are no curves between passes, but straight lines. This option is used with multicopters, which are able to perform this kind of paths.
> - Radius is smaller than half the distance between segments ($R < \frac{d}{2}$) ⇒ **Veronte Ops** generates a semicircle with the diameter equal to the distance between parallel segments.
> - Radius bigger than half the distance between segments ($R > \frac{d}{2}$) ⇒ The path between straight lines is formed by two curves and a straight line.

- **Altitude (AGL)**: Altitude of the waypoints expressed in **AGL**.
- **Direction**: Direction of the route generated on the map.

Note: The options for the waypoints forming the route generated for this photogrammetry polygon are the same as for a 'normal' waypoint. For more information on waypoint configuration, see *Waypoint section* described above.

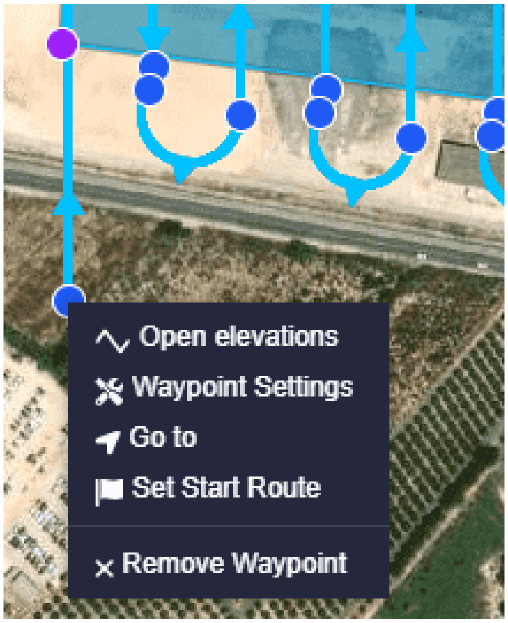


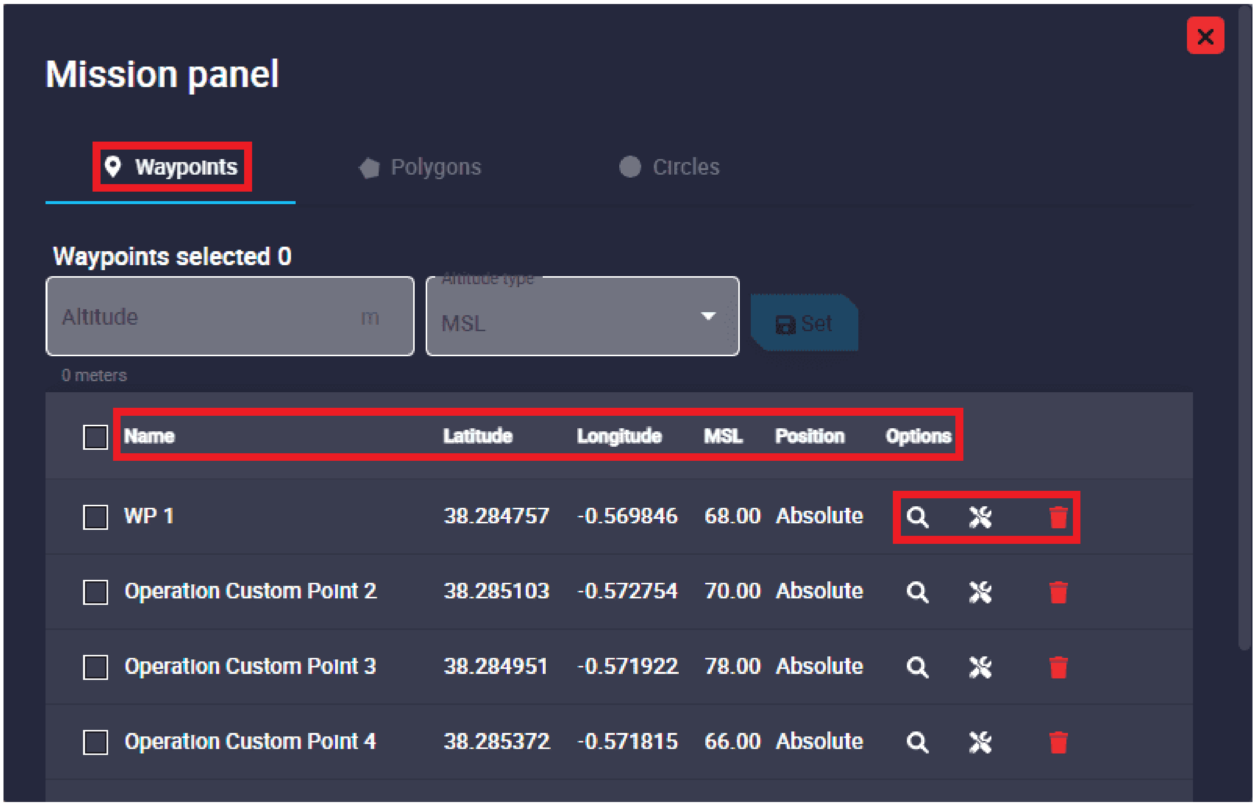
Fig. 121: **Generate route - Waypoint polygon options**

3.2.1.10 Mission panel

This mission panel allows the user to monitor and manipulate the **waypoints**, **polygons** and **circles** created.

- **Waypoints**

  The following fields can be found in this menu:



☐ Name	Latitude	Longitude	MSL	Position	Options
☐ WP 1	38.284757	-0.569846	68.00	Absolute	🔍 🛠 🗑
☐ Operation Custom Point 2	38.285103	-0.572754	70.00	Absolute	🔍 🛠 🗑
☐ Operation Custom Point 3	38.284951	-0.571922	78.00	Absolute	🔍 🛠 🗑
☐ Operation Custom Point 4	38.285372	-0.571815	66.00	Absolute	🔍 🛠 🗑

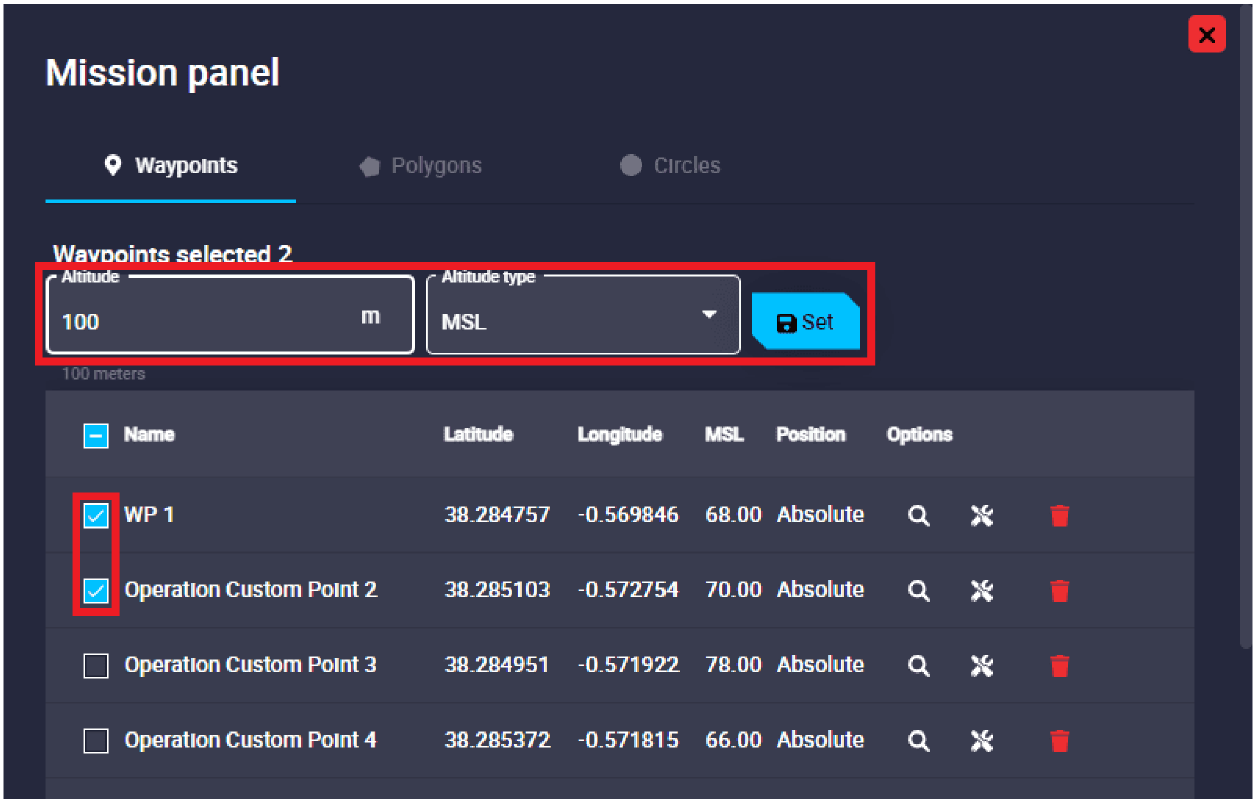
Fig. 122: **Mission panel - Waypoints**

- **Name**: Name of this waypoint defined in the **1x PDI Builder** software.
- **Latitude/Longitude/MSL**: Coordinates of the waypoint.
- **Position**: Absolute or Relative.
  - **Absolute** means that the position of the element is fixed.
  - **Relative** indicates that its position is relative to the position of another element and may change during the operation.
- **Options**:
  - 🔍 **Search**: Clicking here will center and zoom the waypoint on the map.
  - 🛠 **Edit**: Open the waypoint edit menu. For more information on waypoint settings, click *here*.

    It is also possible to **modify the altitude** of one, several or all the selected waypoints by using the **Altitude edit** function **on the top of the list**.

    Note: Selecting all will select the waypoints on all pages of the panel.

    Users must enter the desired **altitude value**, select the **altitude type** (*WGS84*, *MSL* or *AGL*) and finally click '**Set**'.



Waypoints selected 2

Altitude: 100 m

100 meters

Altitude type: MSL

	Name	Latitude	Longitude	MSL	Position	Options
☑	WP 1	38.284757	-0.569846	68.00	Absolute	
☑	Operation Custom Point 2	38.285103	-0.572754	70.00	Absolute	
☐	Operation Custom Point 3	38.284951	-0.571922	78.00	Absolute	
☐	Operation Custom Point 4	38.285372	-0.571815	66.00	Absolute	

Fig. 123: **Middion panel - Waypoints altitude**

    - 🗑 **Delete**: Deletes this waypoint.

- **Polygons**

  The following fields can be found in this menu:

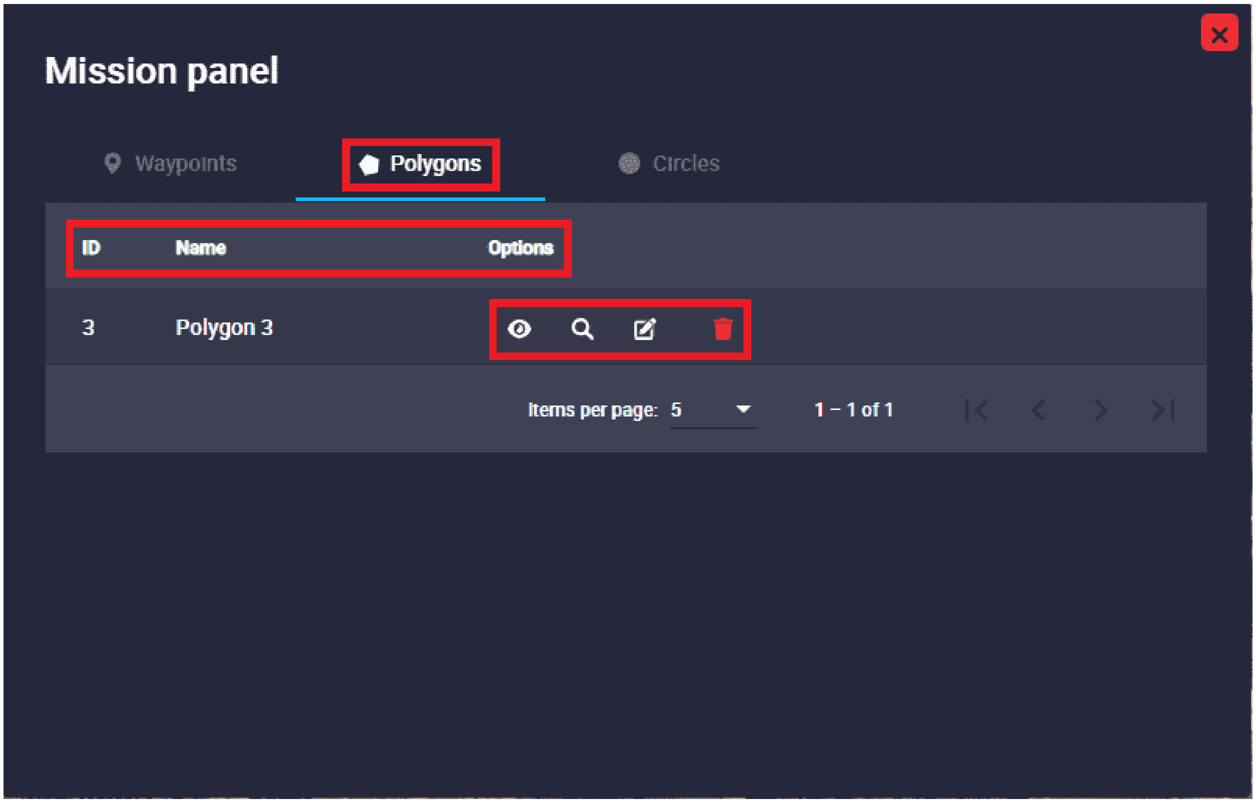
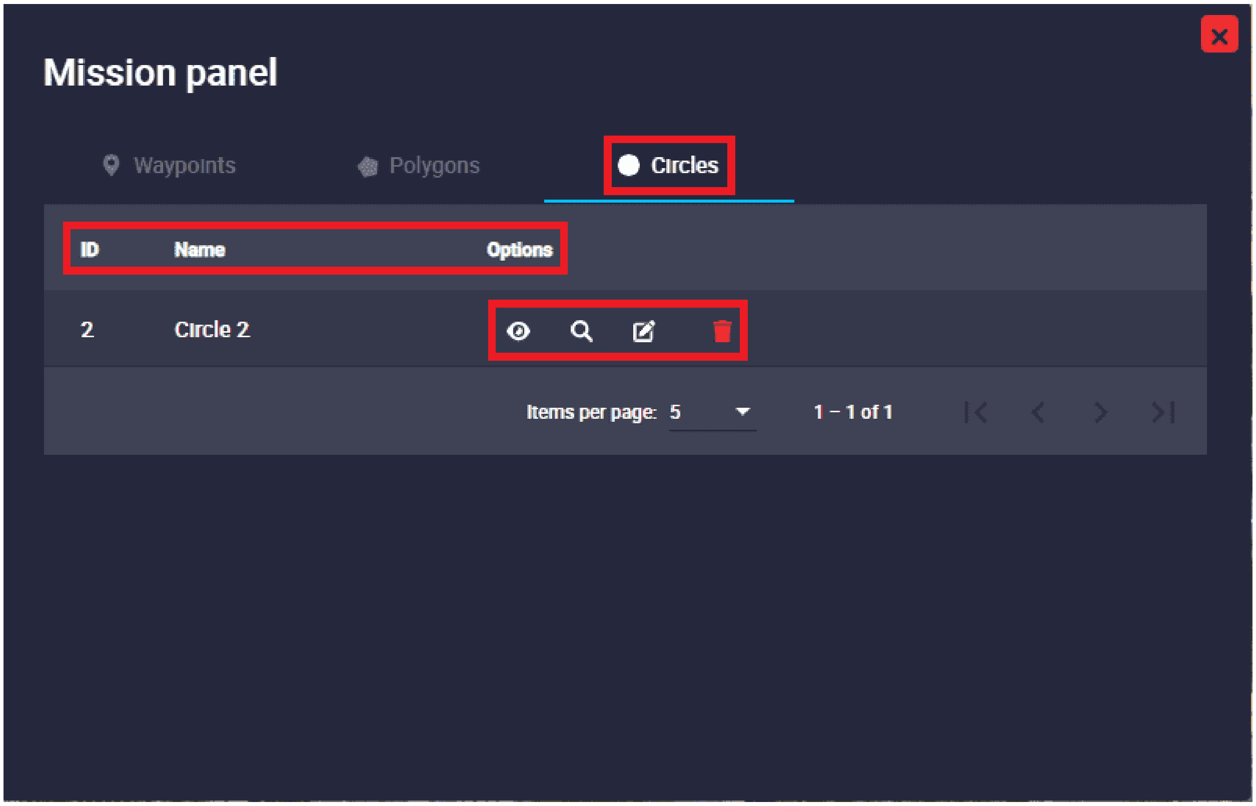


Fig. 124: **Mission panel - Polygons**

  - **ID**: Feature Id of this polygon.
  - **Name**: Name of this polygon defined in the **1x PDI Builder** software.
  - **Options**:
    - **Show/hide**: It is possible to show/hide the polygon on the map by clicking here.
    - **Search**: Clicking here will center and zoom the polygon on the map.
    - **Edit**: Open the polygon edit menu. For more information on polygon settings, click *here*.
    - **Delete**: Deletes this polygon.

- **Circles**

  The following fields can be found in this menu:



ID	Name	Options
2	Circle 2	

Fig. 125: **Mission panel - Circles**

- **ID**: Feature Id of this circle.
- **Name**: Name of this circle defined in the **1x PDI Builder** software.
- **Options**:
  - **Show/hide**: It is possible to show/hide the circle on the map by clicking here.
  - **Search**: Clicking here will center and zoom the circle on the map.
  - **Edit**: Open the circle edit menu. For more information on circle settings, click *here*.
  - **Delete**: Deletes this circle.

3.2.1.11 Edit mission

This tool allows the user to move waypoints, marks, areas, etc., as well as to change their shape.

A detailed explanation on how to use this tool can be found in each of the elements described above.

In addition, **when modifying a mission with a Veronte autopilot 1x connected**, the "original operation" loaded in the autopilot will be greyed out and the modified one will be coloured. This will be the case until the new changes are saved and uploaded to the autopilot, so the previous operation will be completely removed from the map. An example is shown below:

Fig. 126: **Edit mission**

3.2.1.12 Turn on multiselection

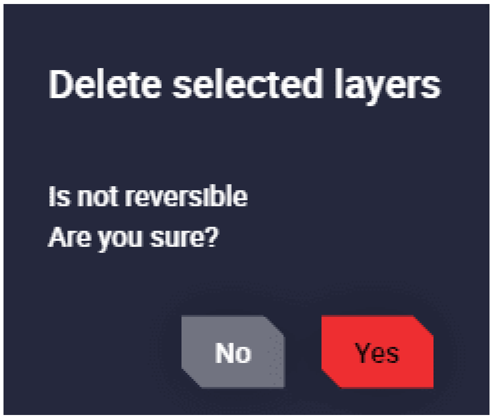
Multiselection allows to **move and rotate mission's path** from one place on the map to another.

- Select the tool and create a rectangle by clicking and dragging until the waypoints you want to move fall into it.
- With the points selected, click and drag the rectangle to move it to the desired location. And to rotate it, click on the 'white pin' ( ) and drag it to the desired rotation angle.
- After that, click again in the tool's icon to deselect.

Note: Runways and spots cannot be moved with this tool.

Fig. 127: **Multiselection tool**

In addition, **this tool also allows to delete all items selected** by **pressing the 'delete' key** on the user's keyboard. Before deleting the selected items, the following confirmation message appears:



Delete selected layers

Is not reversible
Are you sure?

Fig. 128: **Multiselection tool - Remove message**

Note: Runways and spots cannot be deleted in this way.

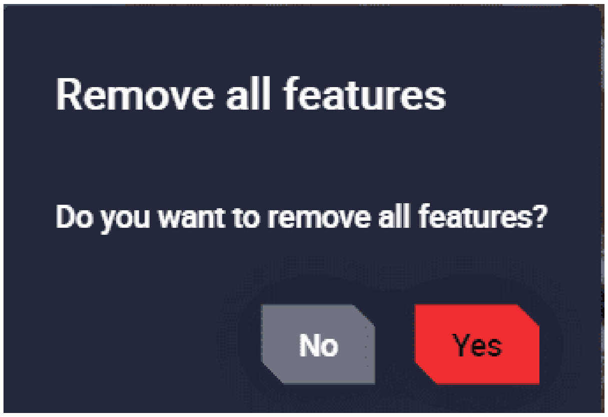
Fig. 129: **Multiselection tool - Remove**

3.2.1.13 Remove mission

By clicking on this icon, the user can remove all the elements created by simply clicking on each of them.

Fig. 130: **Remove mission**

However, if the user wishes to remove all the missions created, simply click on the second icon that appears: . A confirmation pop-up window will then appear to make sure that all missions wish to be deleted.



Remove all features

Do you want to remove all features?

Fig. 131: **Remove all missions**

3.2.2 Measure

3.2.2.1 Turn on ruler

Using the ruler, the user can measure distances and azimuths.

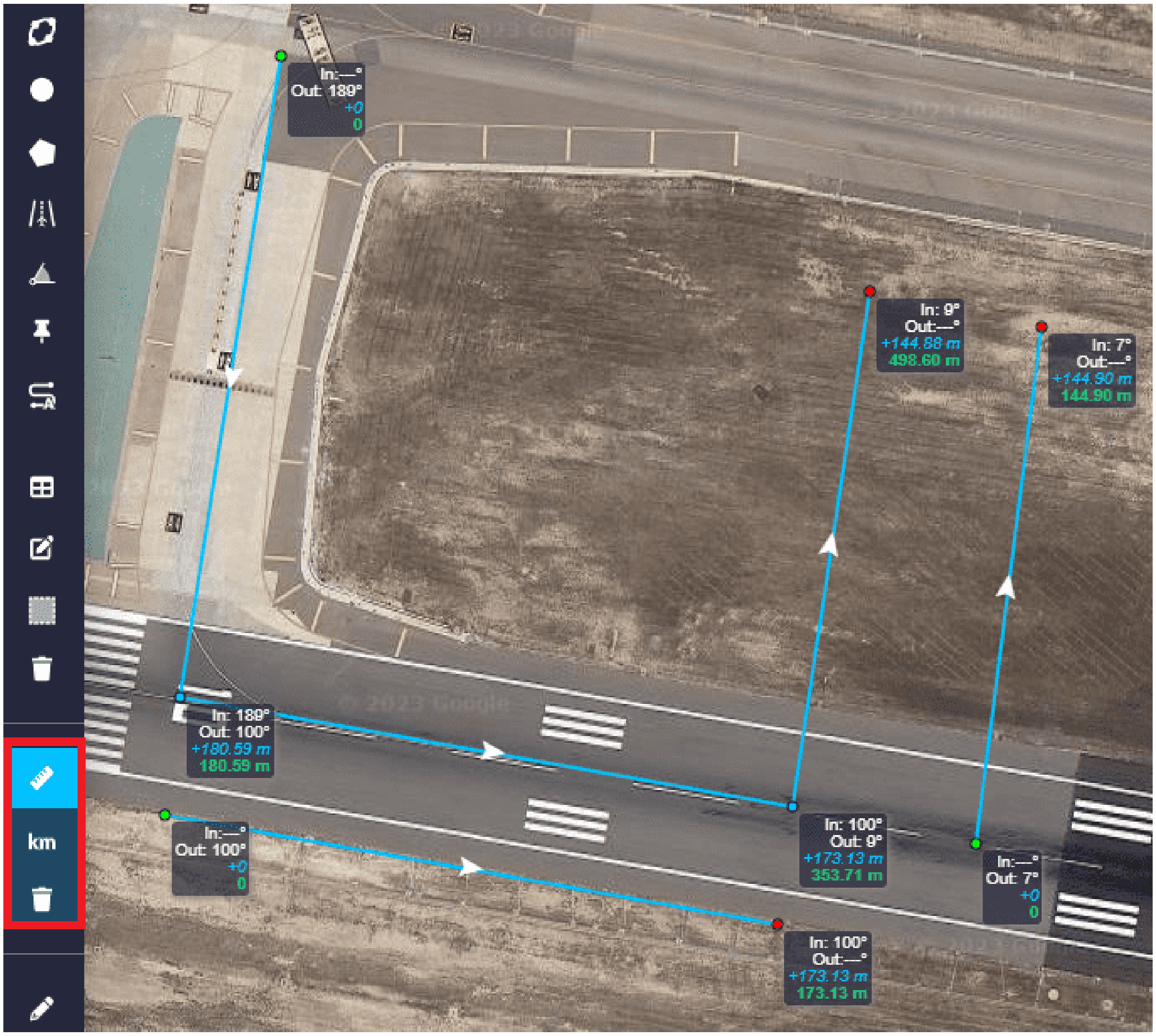


Fig. 132: **Ruler**

The following information can be found in the each point of the figure above:

- In (º): **Azimuth** in **degrees** of the 'incoming' measure. The **azimuth** is the angle of the segment with respect to North.
- Out (º): **Azimuth** in **degrees** of the 'outcoming' measure. The **azimuth** is the angle of the segment with respect to North.
- Blue measurement: Distance from the previous point.
- Green measurement: Distance from the first point.

Note: There 3 different types of points on the ruler segments:

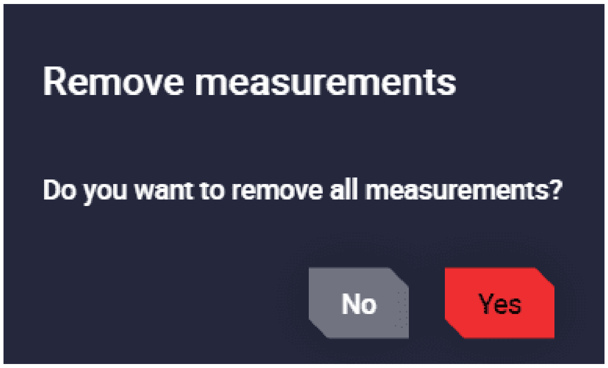
- Green point: Indicates the start of the route.
- Blue point: Midway point of the route.
- Red point: End of the route.

In addition, by clicking on the ruler icon, two more options will appear:

- km **Change units**: The user can change the units of the measurements by clicking on this icon. The available units are: km (kilometeres), mi (miles) and nm (nautical miles).

  Note: The ruler indicates the **measures with 2 decimals** in order to have more precision, as can be seen in the figure above.

- 🗑 **Clear measurements**: By clicking on it, it is possible to delete all the measurements in the mission. A confirmation pop-up window will then appear to make sure that all measurements wish to be deleted.



Remove measurements

Do you want to remove all measurements?

Fig. 133: **Remove all measurements**

3.2.3 Paint

3.2.3.1 ✎ Enable paint

This tool allows the user to make quick notes during the operation.

To access the paint option, click on this icon, a ‘Paint toolbar’ will then appear:

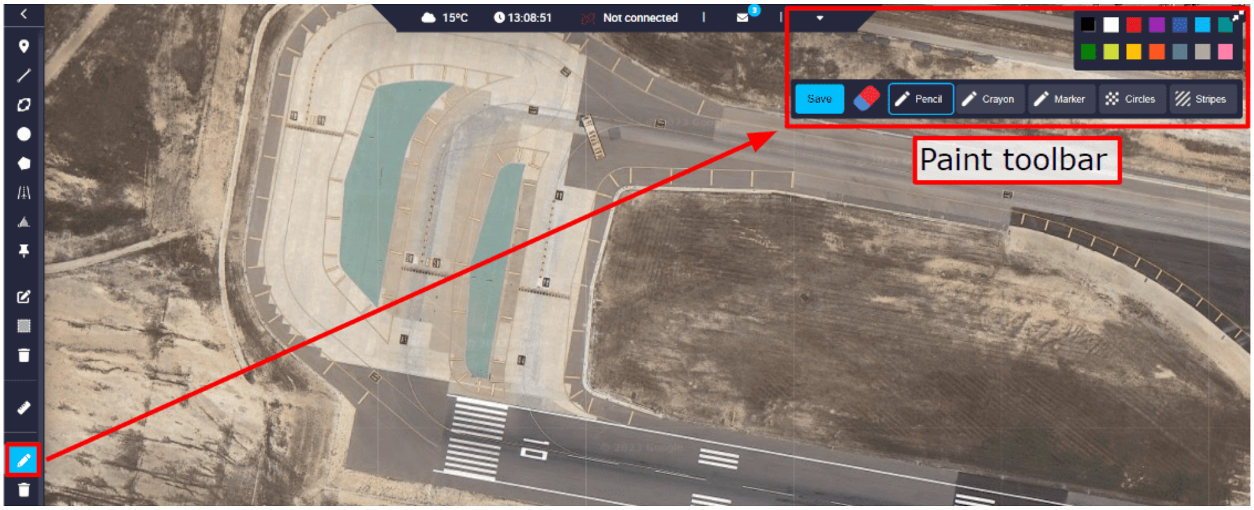


Fig. 134: **Paint toolbar**

Users can choose from a variety of ‘writing elements’ and colors to paint:

- Pencil
- Crayon
- Marker
- Circles
- Striples

An example of each is shown in the figure below:

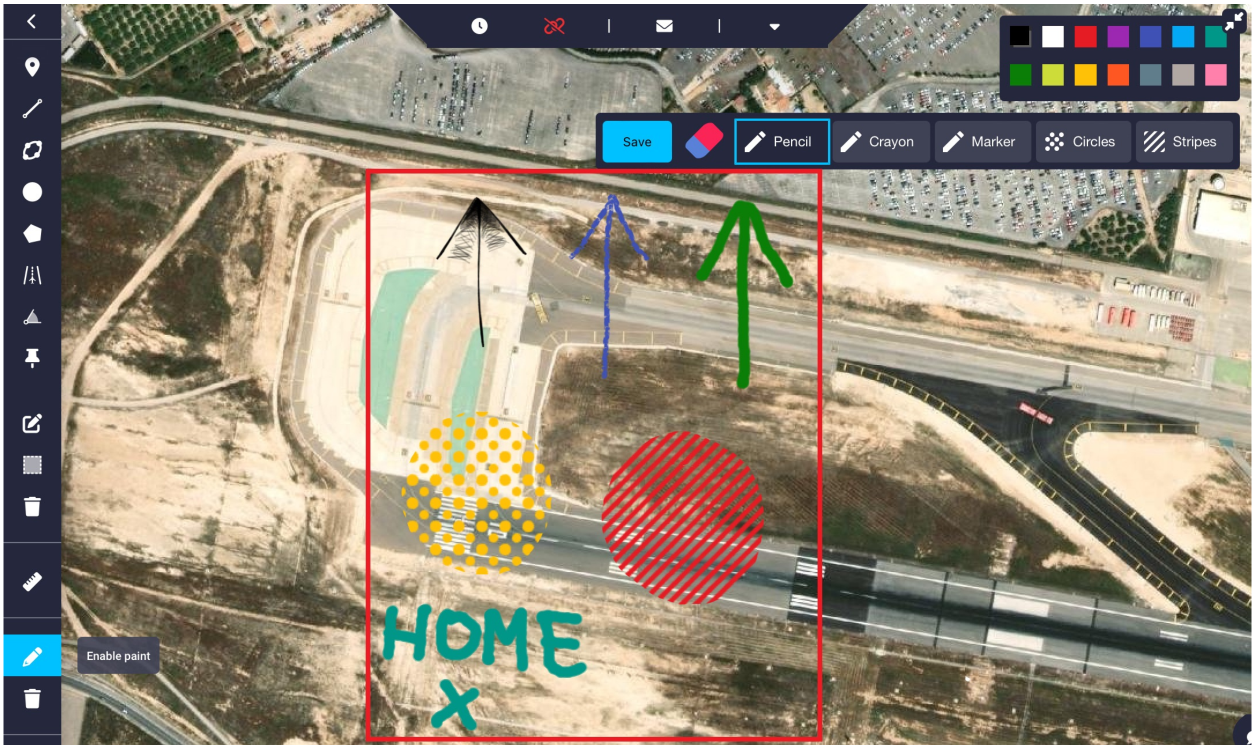
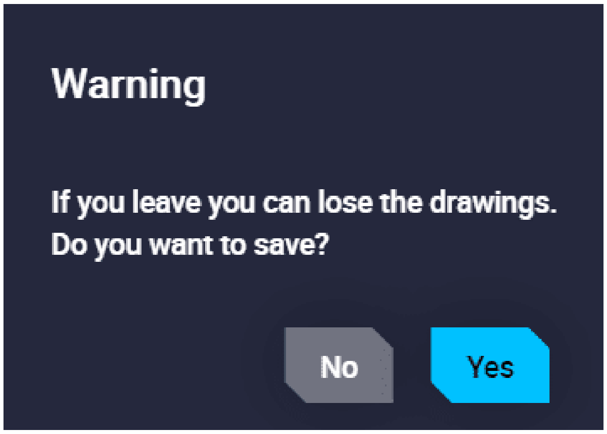


Fig. 135: **Paint examples**

In addition, all notes made can be erased with an eraser, if they are not already saved, by clicking on the 'eraser option' in the toolbar.

Fig. 136: **Paint erased**

Note: To save all the notes made here, it is important to click on the '**Save**' button, otherwise they will not be saved. If they are not saved, the following message will appear when exiting the 'Paint' option:



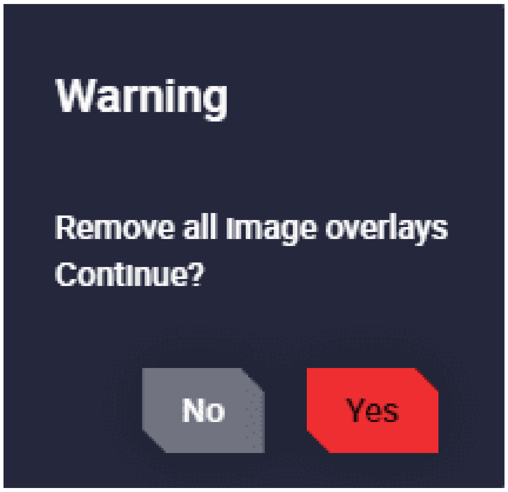
Warning

If you leave you can lose the drawings.
Do you want to save?

Fig. 137: **Warning paint not saved**

3.2.3.2 Delete paint

All paints will be removed. The following confirmation pop-up window will appear:



Warning

Remove all image overlays
Continue?

Fig. 138: **Remove paint**

3.2.4 Offline

This option is designed for when users operate offline, i.e. they do not have internet access to download map information. For this reason, the map tiles of the area to work on can be pre-downloaded.

The following options are available in this section:

3.2.4.1 Show downloaded tiles

This option works differently when working online and offline:

- **Online**: If the user has already downloaded tiles, when clicking on this icon, the area with the downloaded tiles will be marked with a blue rectangle:

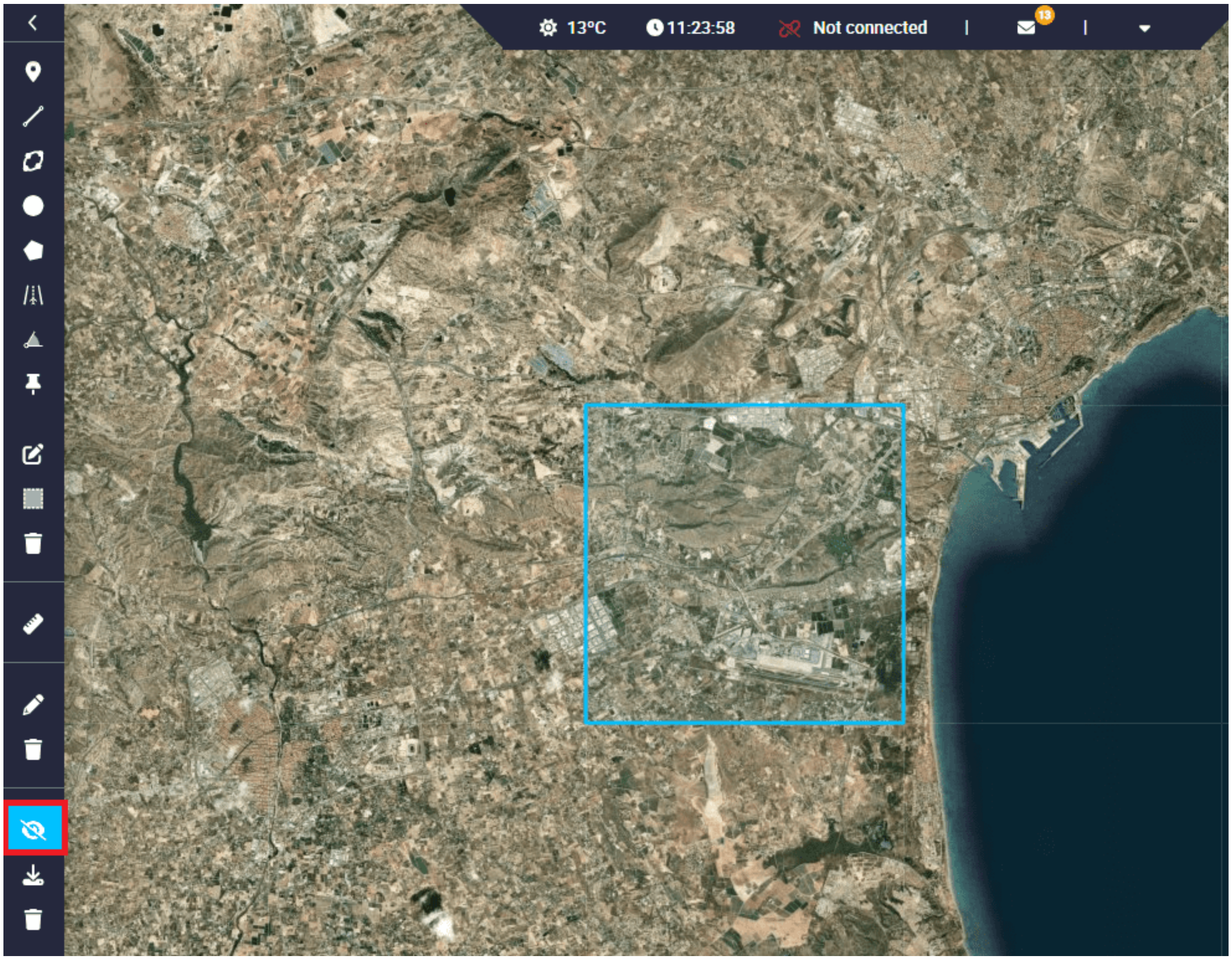
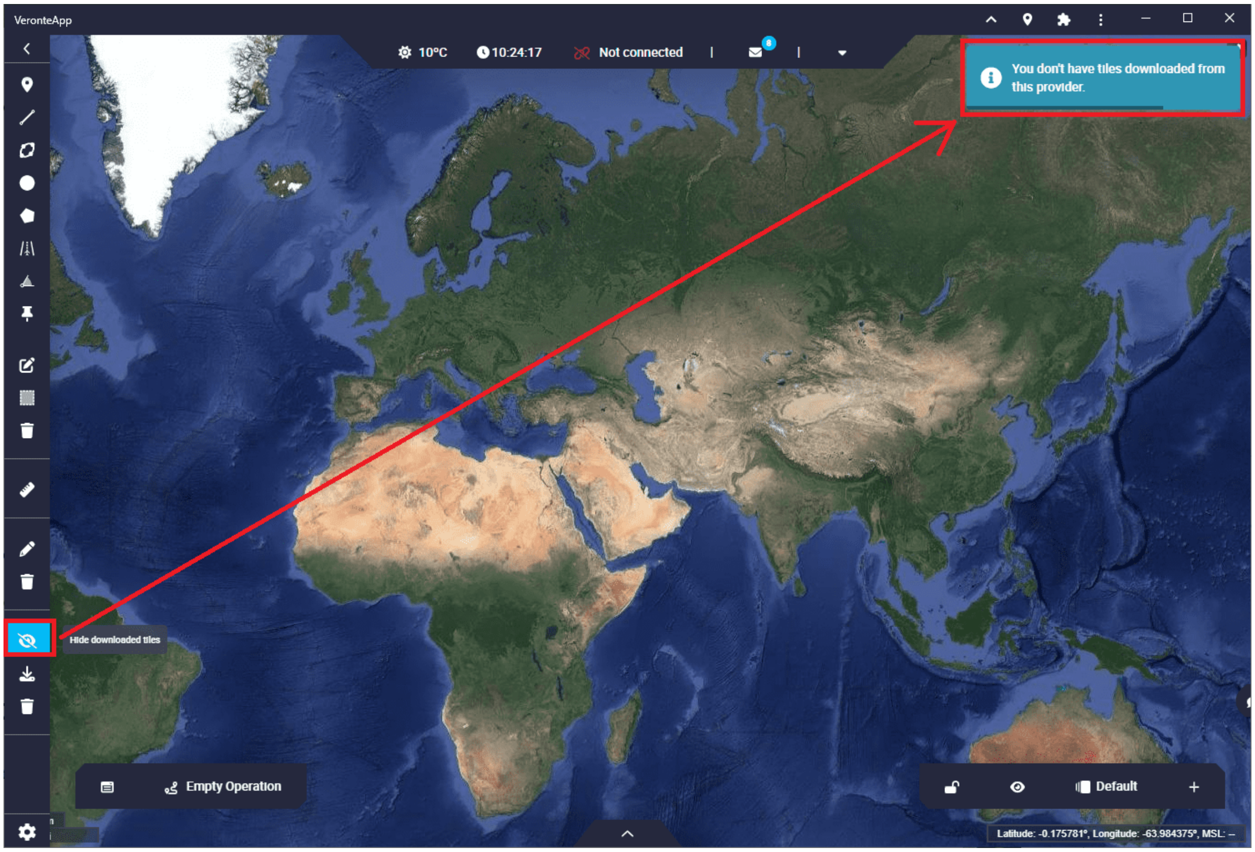


Fig. 139: **Show tiles**

If the user has not downloaded any tiles, the following message will appear when clicking here:



You don't have tiles downloaded from this provider.

Fig. 140: **Show tiles - don't have downloaded**

- **Offline**: If the user has already downloaded tiles, when clicking on this icon, these tiles will always appear:

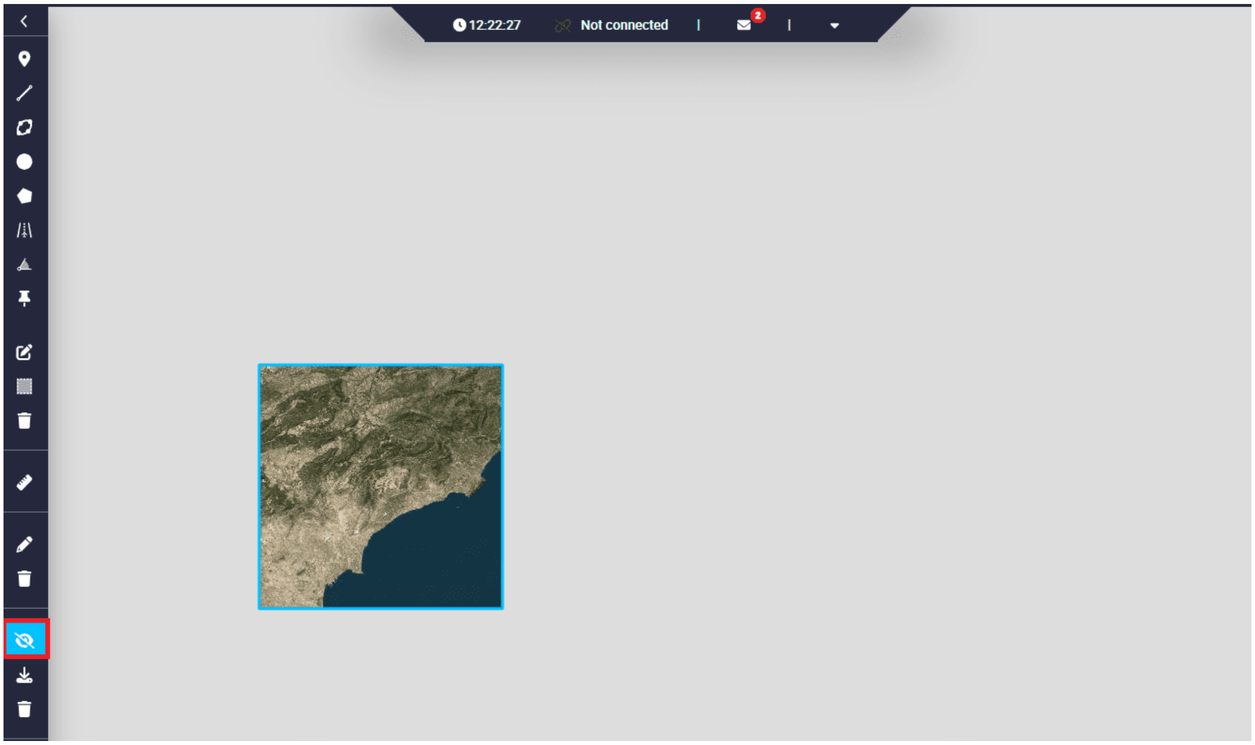


Fig. 141: **Show tiles**

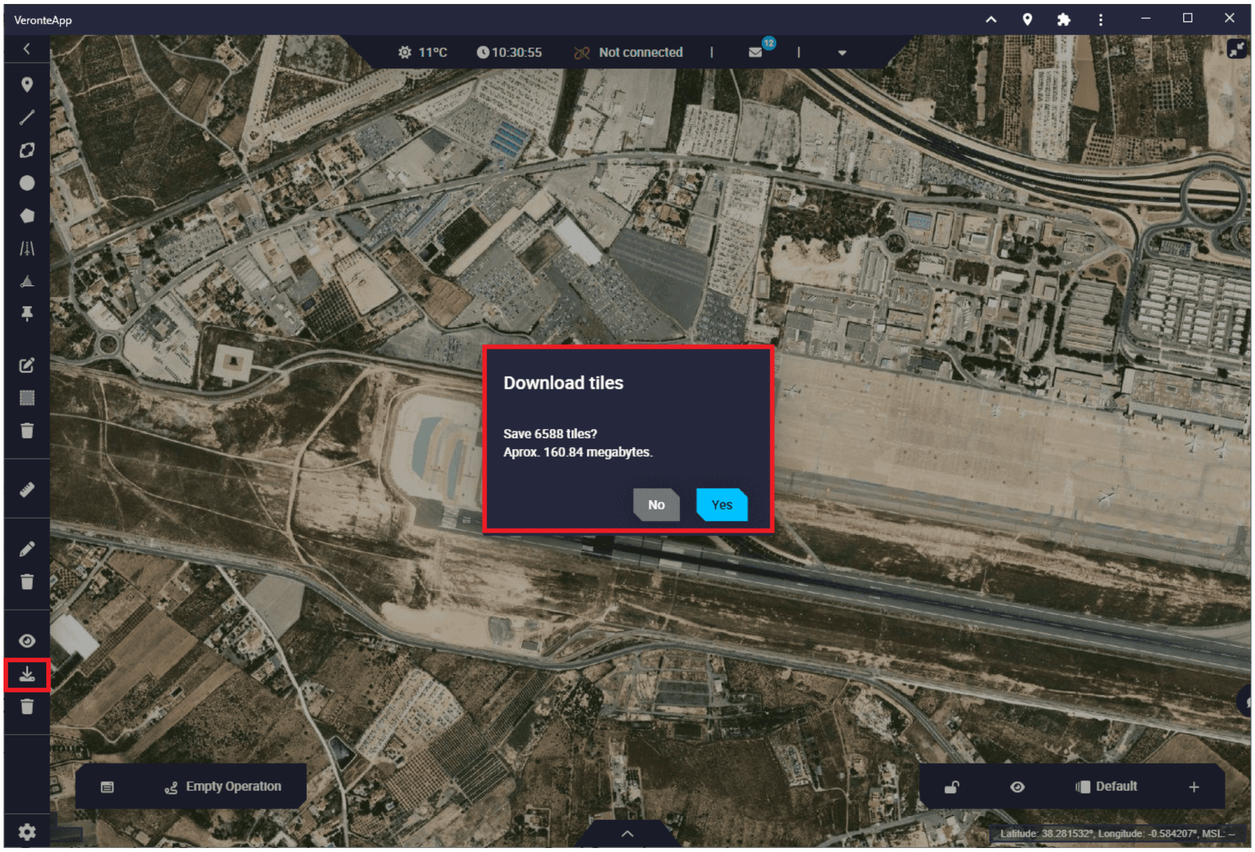
If the user has not downloaded any tiles, they may appear because they are stored in the Veronte Ops cache, however, it is not certain that this will always happen. Therefore, it is recommended to have the map tiles downloaded when working offline.

3.2.4.2 Save tiles

The tiles that the user is viewing will be downloaded. An example is shown below:

1. Click on this icon when the user is zooming in on the tiles in the desired area to download:

> **Warning:** As each zoom level in Veronte Ops counts as an independent map tile. When downloading map information, make sure that all relevant zoom levels are downloaded.



Download tiles

Save 6588 tiles?
Aprox. 160.84 megabytes.

Fig. 142: **Download tiles**

2. The tile download process will then begin:

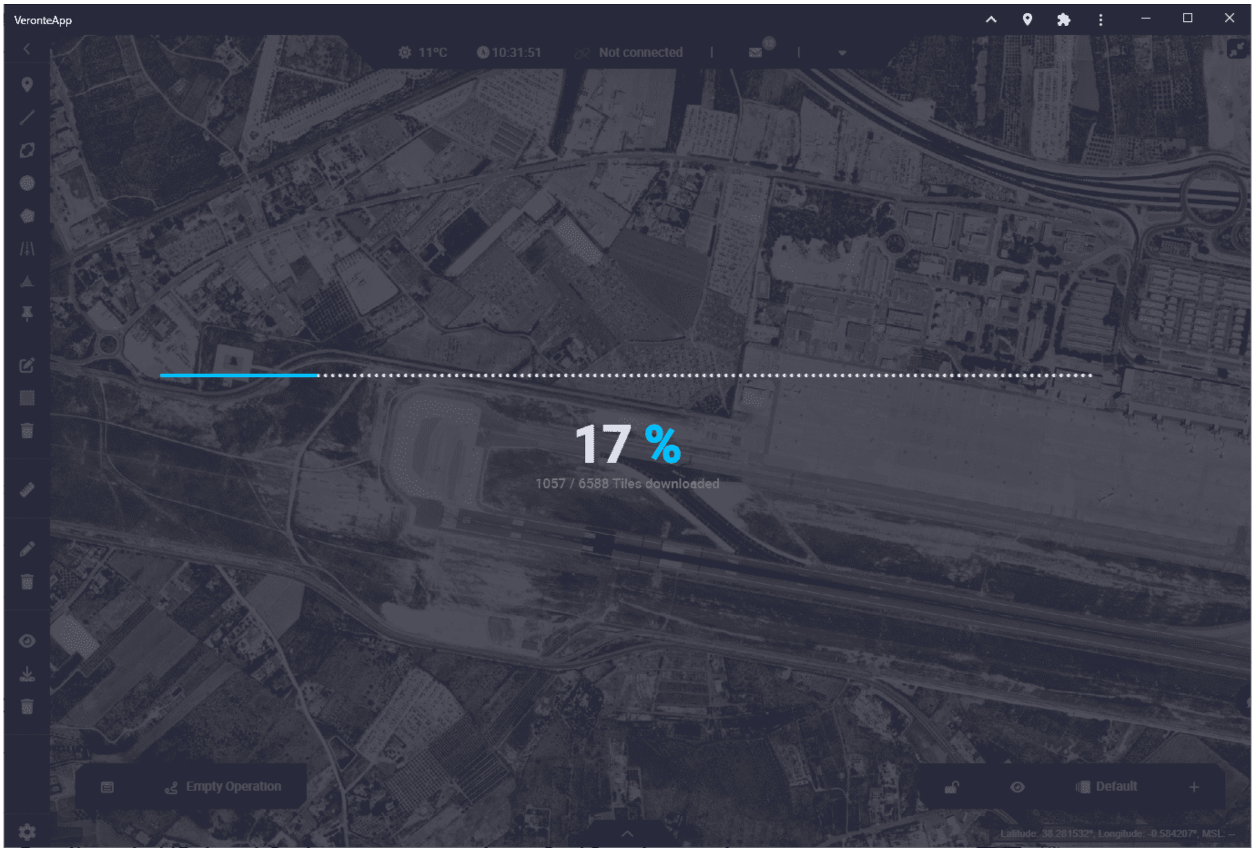
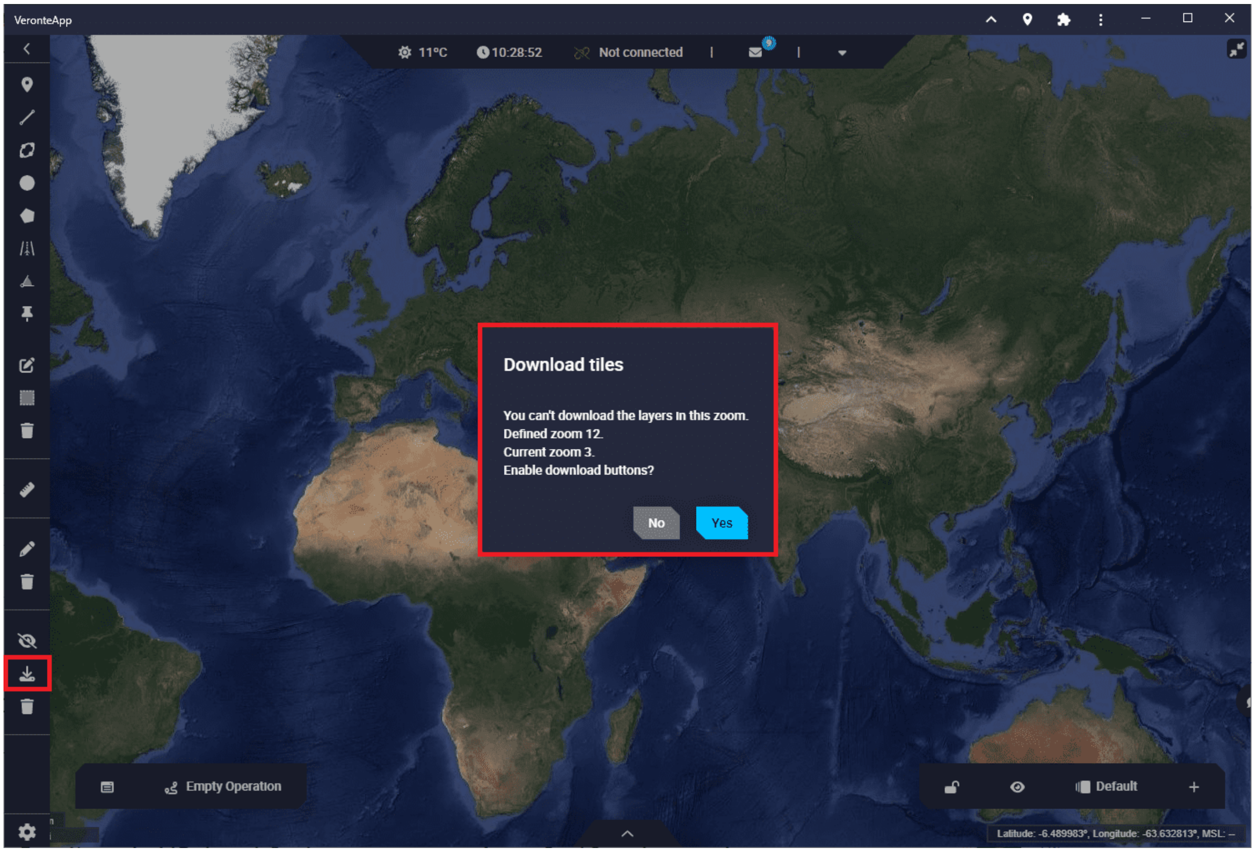

VeronteApp
11°C
10:31:51
Not connected
17 %
1057 / 6588 Tiles downloaded
Empty Operation
Default
Latitude: 38.281532°, Longitude: -0.584207°, MSL: --

Fig. 143: **Downloading tiles**

3. Finally, by clicking on the above option, users can view the downloaded map tiles of the desired area.

If there is no significant zoom, Veronte Ops will not download these files because there are too many of them. The following message will appear:



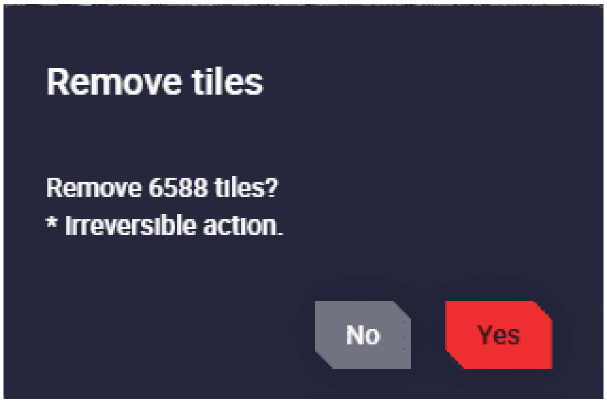
Download tiles

You can't download the layers in this zoom.
Defined zoom 12.
Current zoom 3.
Enable download buttons?

Fig. 144: **Not possible to download tiles**

3.2.4.3 Remove tiles

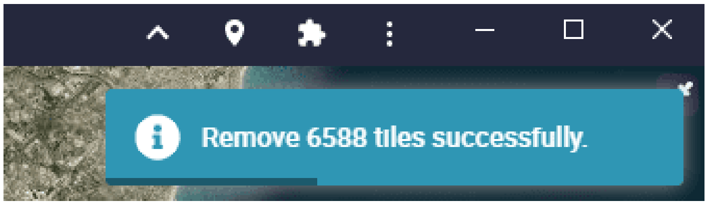
Clicking on this icon will delete all tiles downloaded tiles. The following messages will appear:



Remove tiles

Remove 6588 tiles?
* Irreversible action.

Fig. 145: **Remove tiles**

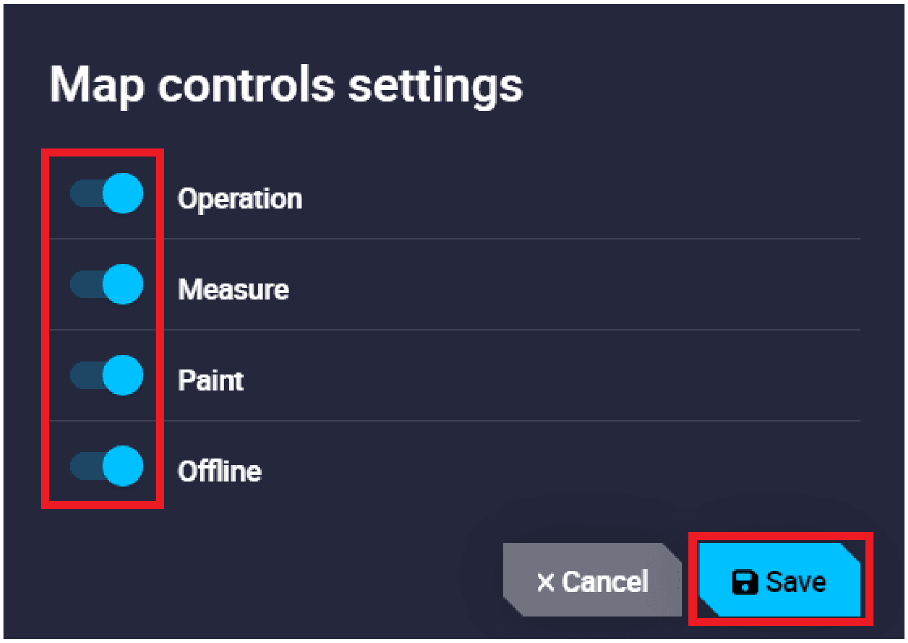


Remove 6588 tiles successfully.

Fig. 146: **Remove tiles successfully**

3.2.5 Settings

By clicking here, a settings menu window will appear:



Map controls settings

Operation

Measure

Paint

Offline

Fig. 147: **Settings menu**

Here, the user can choose, by enabling or disabling them, the group of functionalities to be displayed in the mission toolbar.

To save the changes made, click on the '**Save**' button.

Each group of funcionalities has been described in the previous sections.

- *Operation*
- *Measure*
- *Paint*
- *Offline*

3.3 Operation

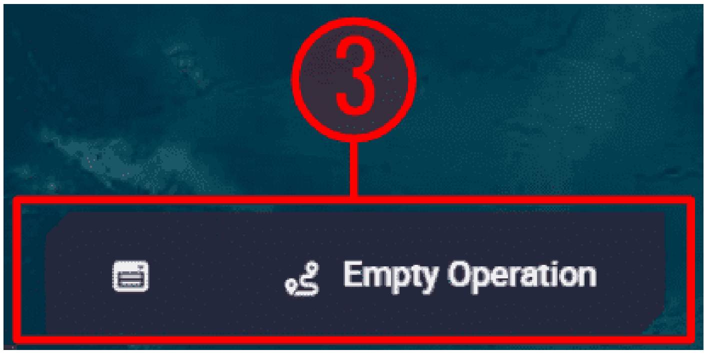


Fig. 148: **Operation toolbar**

The Operation toolbar is composed by 3 'parts': **Operation panel**, **Operations** and **Operation actions**. However, in the figure above there is no *Operation actions* part because there was no Veronte Autopilot 1x connected.

In the figure below, users can see these 3 'parts' when an Autopilot 1x is connected:

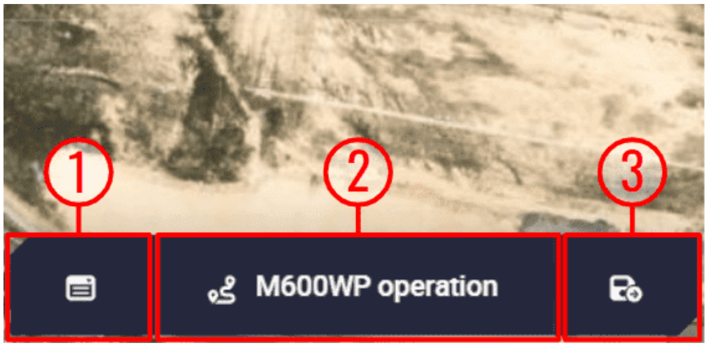


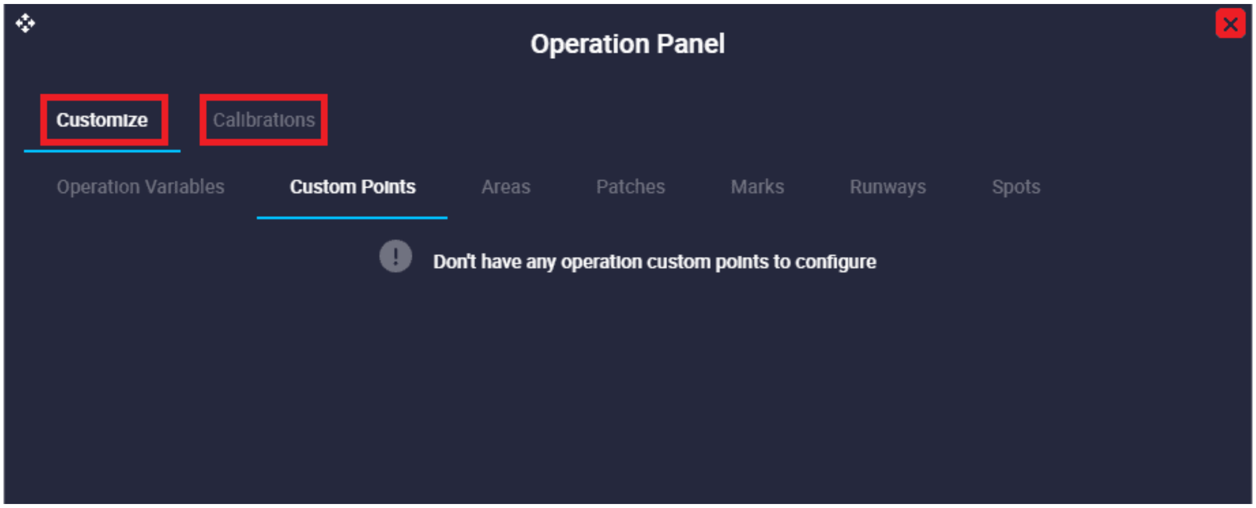
Fig. 149: **Operation toolbar - Autopilot connected**

1. *Operation panel*: Here the user can customize operation elements related to the operation and carry out some simple calibrations such as calibration of atmosphere, wind, DEM, etc.
2. *Operations*: Users shall be able to select an operation other than the one loaded on the autopilot and load it.
3. *Operation actions*: These are actions related to when changes are applied to the operation/mission, such as *Revert*, *Save* and *Upload* changes. This 'part' is only available when a Veronte 1x Autopilot is connected.

   In addition, when a change is made, the other 2 actions (*Revert* and *Save*) appear.

3.3.1 Operation panel

This menu is divided into 2 different functionalities: manage **operation elements** in the **Customize** tab, and **simple calibrations** in the **Calibrations** tab.



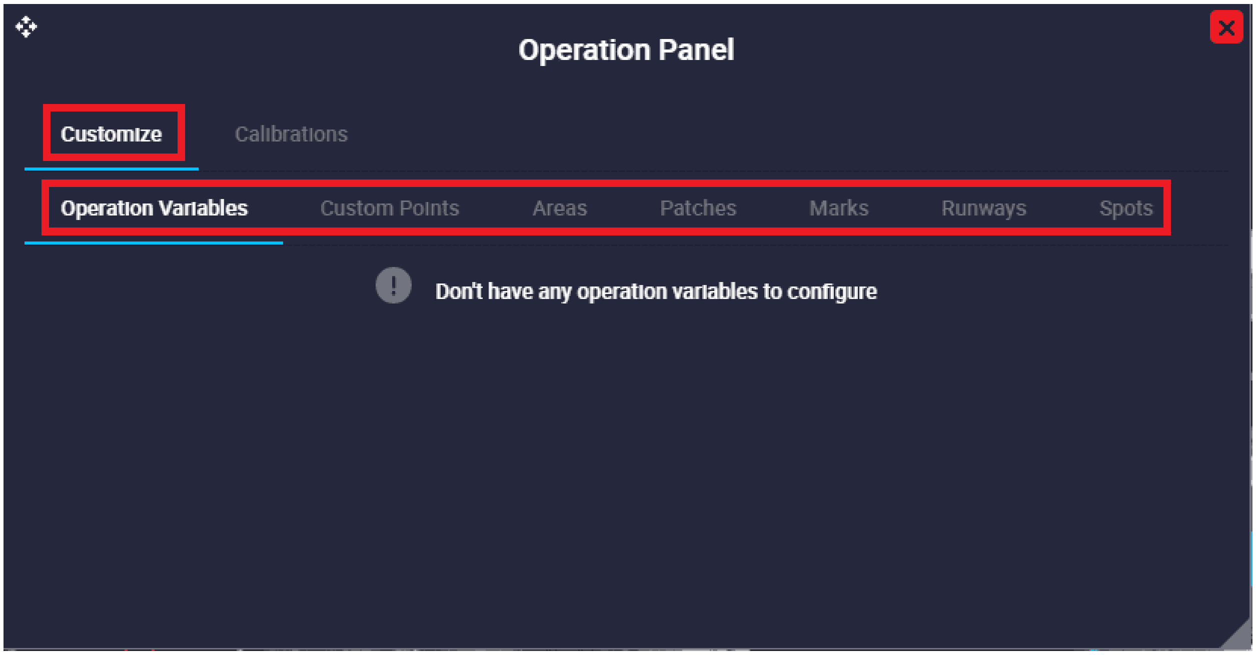
Don't have any operation custom points to configure

Fig. 150: **Operation panel**

All parameters included in this panel are explained in detail in the following sections.

3.3.1.1 Customize

In this part of the menu users can find all the operation elements used during the operation and mission: *Operation Variables, Custom Points, Areas (polygons and circles), Patches, Marks, Runways* and *Spots*.



Don't have any operation variables to configure

Fig. 151: **Operation panel - Customize tab**

If users wish to link a mark, patch, polygonal area, etc., to one of these variables, it is first necessary to define (rename) them in the **UI menu of the 1x PDI Builder software**, as described and explained in the corresponding section of the 1x PDI Builder manual, click here to access it.

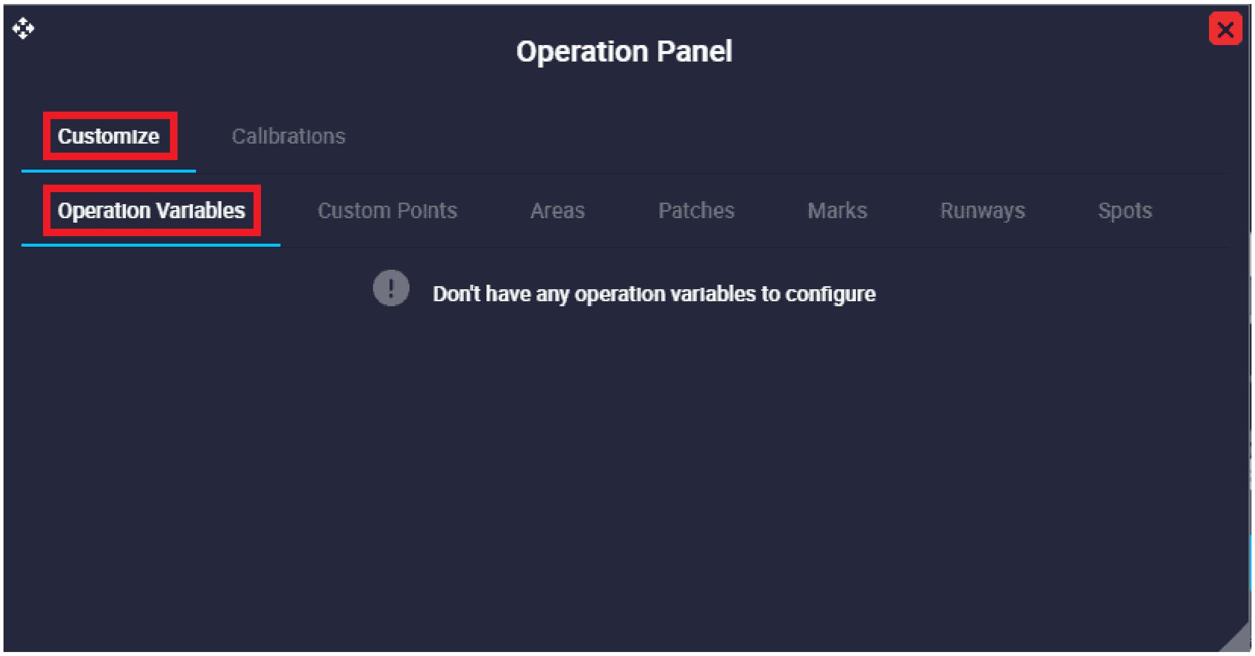
3.3.1.1.1 Operation Variables

Operation Variables are configurable values, postitions and directions that can vary depending on the mission.

Examples of *Operation Variables* can be:

- Mission duration
- Cruise speed
- Flight level
- Takeoff and landing direction
- Home point
- Start of route

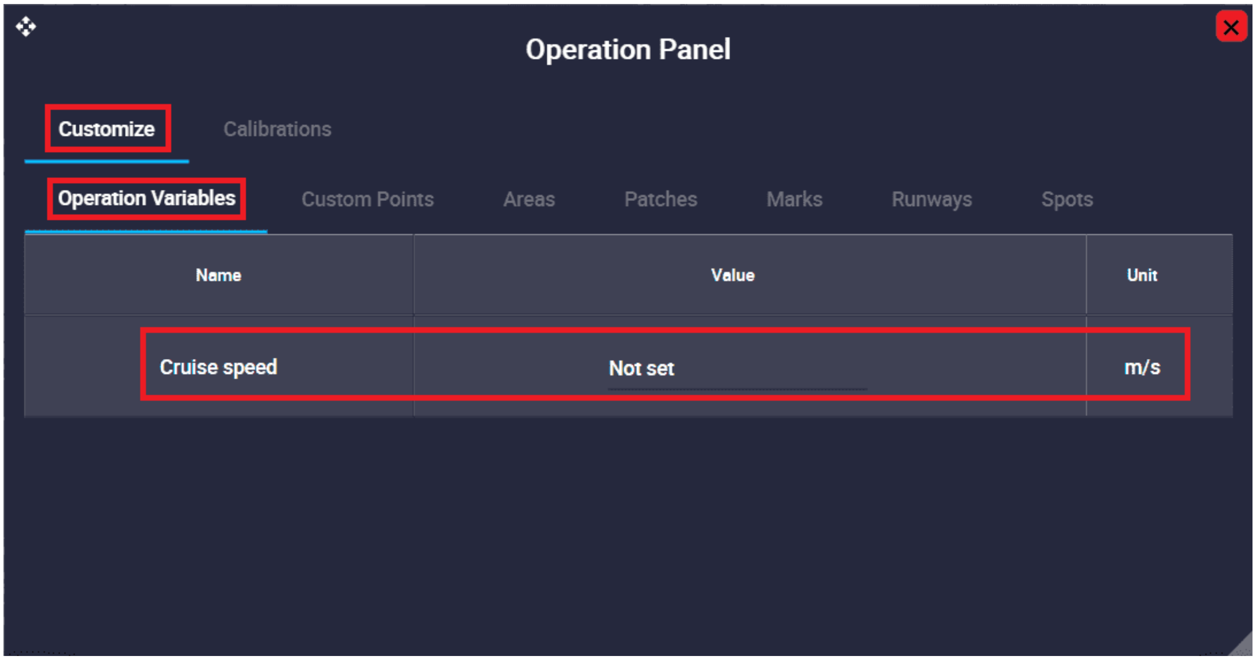
Their main advantage is that **it is not necessary to access Veronte Autopilot configuration to modify them**. In this way, the operator can modify certain parameters without the need of having access to the entire configuration.



Don't have any operation variables to configure

Fig. 152: **Operation Variables**

As explained above, operation elements must be created while building a Veronte Autopilot configuration. So, when a new *Operation Variable* is created, a new field will appear in the operation variables tab:



Name	Value	Unit
Cruise speed	Not set	m/s

Fig. 153: **New Operation Variable**

After this, the value of this variable can be defined using this menu. The user simply clicks on the value cell, enters the desired new value and saves the change (🖫 button, this is explained in the *Save operation section* section below). An example is shown below:

Fig. 154: **Operations Variables configuration**

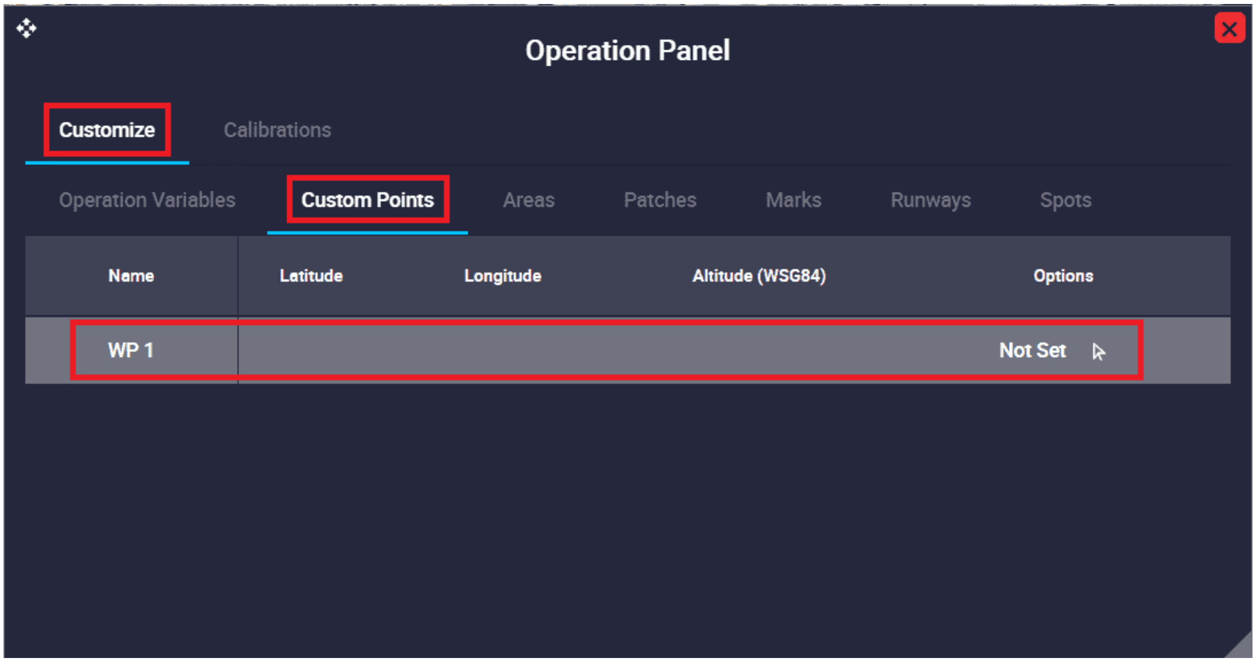
Warning: Although it is possible to modify Operation Parameters during the flight, this practice is not recommended.

Whenever changing values during an operation, make sure that no potential risk to flight safety is involved.

3.3.1.1.2 Custom Points

A **Custom point** is an operation element that can be linked to a waypoint of the configured mission.

As explained above, an operation element only appears in this panel when it has been previously defined in the 1x PDI Builder software.



Name	Latitude	Longitude	Altitude (WSG84)	Options
WP 1				Not Set

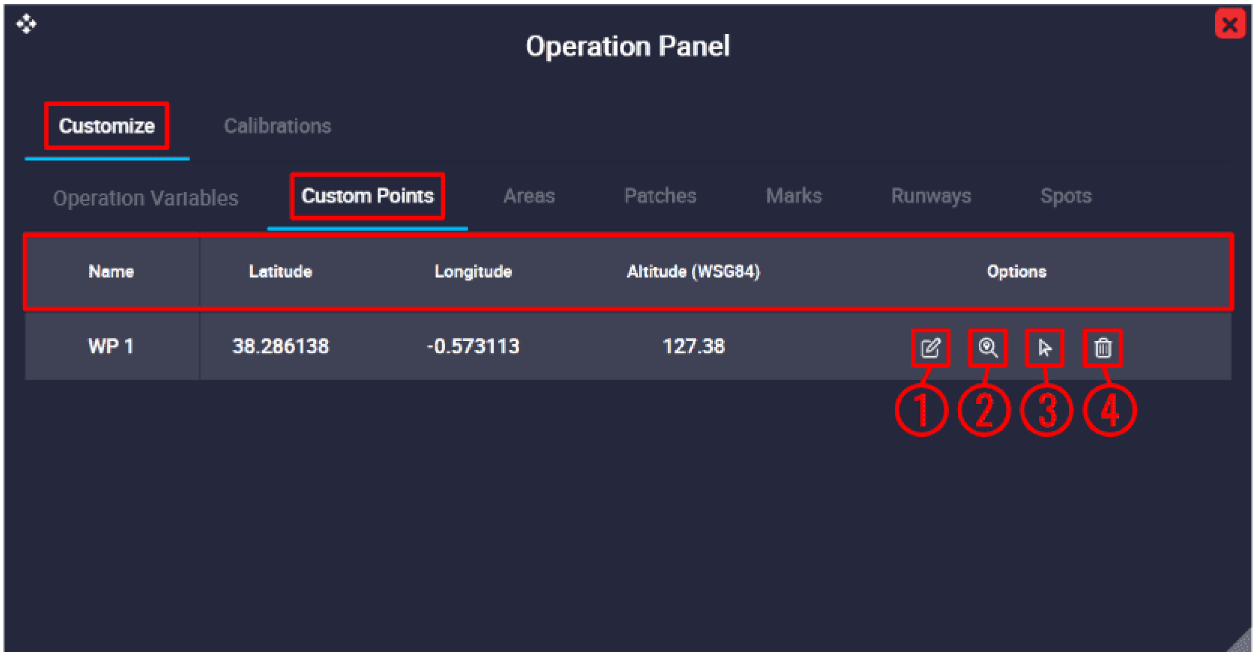
Fig. 155: **Custom point**

Therefore, as can be seen in the figure above, this *Custom point* has been defined in the autopilot configuration, but is **not yet configured**.

To configure it, it is necessary to click on the ↖ icon to link this *Custom point* to a waypoint of the mission. An example is shown below:

Fig. 156: **Custom point configuration - Select point**

Once, the *Custom point* is linked to a waypoint, the following options will appear in the operation panel:

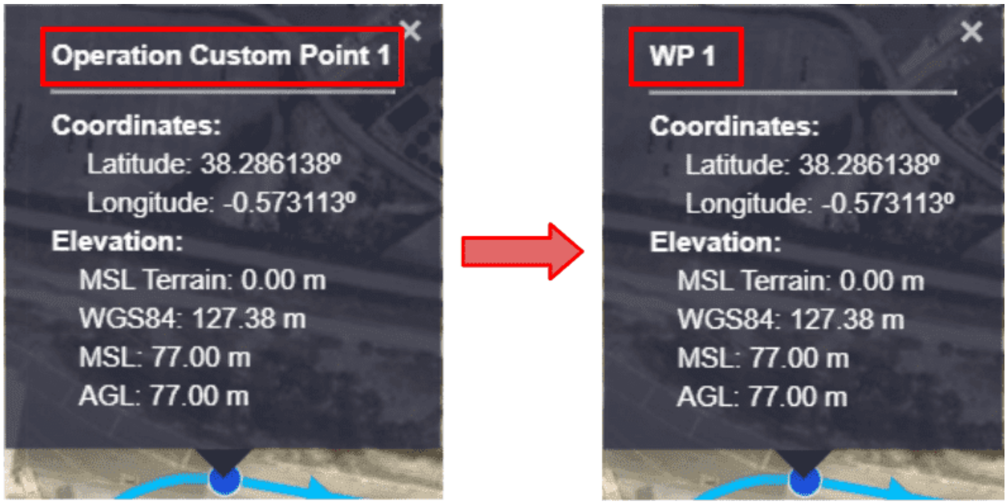


Name	Latitude	Longitude	Altitude (WSG84)	Options
WP 1	38.286138	-0.573113	127.38	

Fig. 157: **Custom point configuration**

- **Name**: Name of this *Custom point* **defined in the 1x PDI Builder** software.
- **Coordinates**: Latitude, longitude and altitude (WGS884) of the selected point.
- **Options**: These are configuration options of the *Custom point*:
  1. **Edit options**: This option allows the user to manually edit the position of the *Custom point*. Its configuration is the same as for a waypoint (a detailed explanation of this has been described in the *Waypoint* section).
  2. **Search**: By clicking here, Veronte Ops will center and zoom in on the area of the map where this *Custom point* is defined.
  3. **Select in map**: To link the *Custom point* to a different waypoint, click here and select it on the map.
  4. **Remove reference**: The user can remove the *Custom point* configuration by clicking here.

Moreover, by clicking on the linked waypoint, it will appear with the name of the configured *Custom point*:


Operation Custom Point 1

Coordinates:
Latitude: 38.286138º
Longitude: -0.573113º
Elevation:
MSL Terrain: 0.00 m
WGS84: 127.38 m
MSL: 77.00 m
AGL: 77.00 m

WP 1

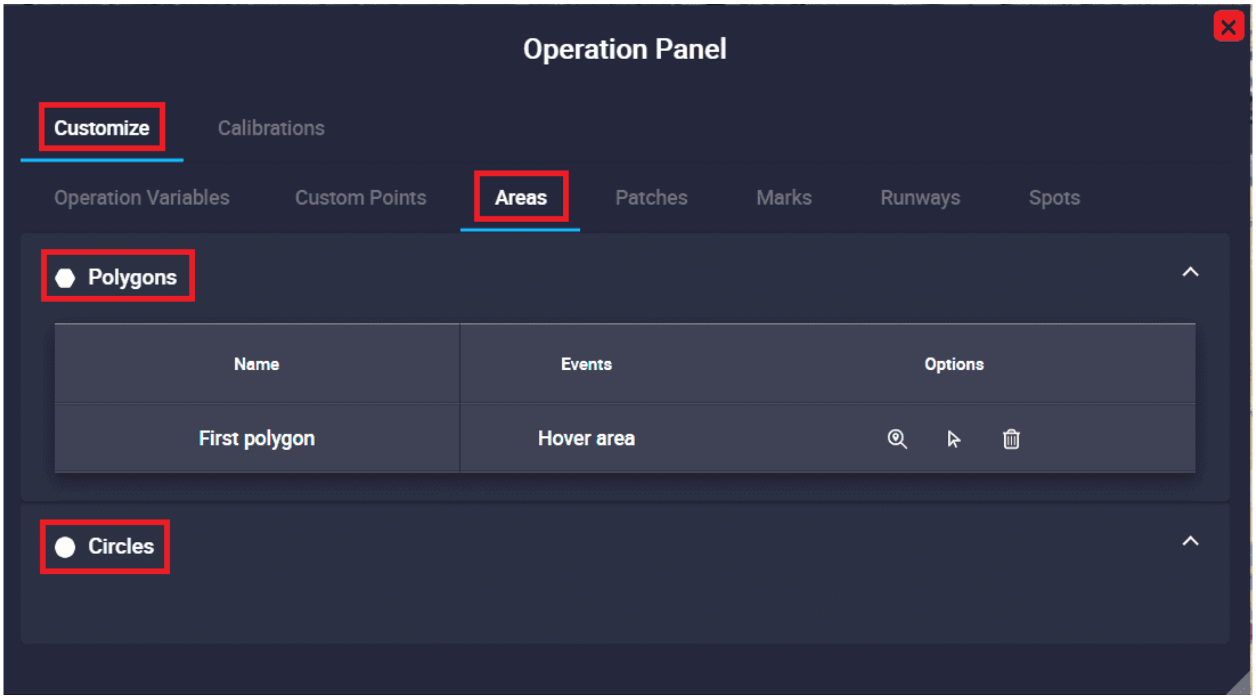
Coordinates:
Latitude: 38.286138º
Longitude: -0.573113º
Elevation:
MSL Terrain: 0.00 m
WGS84: 127.38 m
MSL: 77.00 m
AGL: 77.00 m

Fig. 158: **Custom point description**

3.3.1.1.3 Areas

This tab includes **polygonal and circular areas**.

These operation elements, *Polygons* and *Circles*, are detection areas that can be linked to polygons or circles of the configured mission.



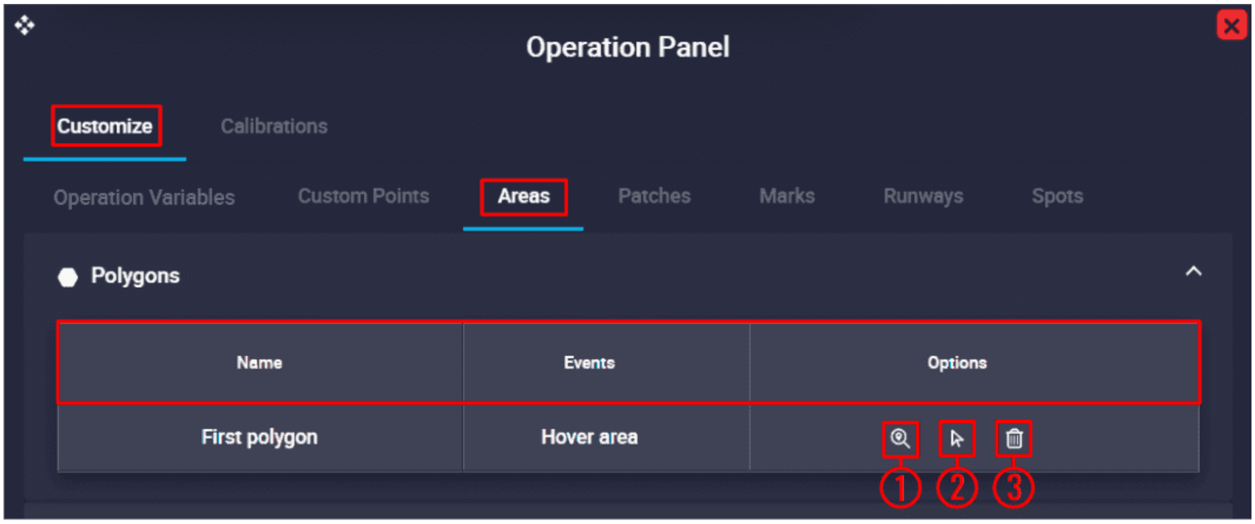
Name	Events	Options
First polygon	Hover area	

Fig. 159: **Areas**

In the image above, the user can identify that there is a polygonal area already defined and configured and that there is no circular area either configured or defined.

If the user wants to **define** a circular area, this has to be done in **1x PDI Builder**, as described at the beginning of the *Customize section*. Then, to configure it, the process is the same as described for *Custom points*.

Once an *Area* has been defined and configured, the following options are displayed in the operation panel:



Name	Events	Options
First polygon	Hover area	

Fig. 160: **Are configuration**

- **Name**: Element identifier, this has been **defined in the 1x PDI Builder** software.
- **Events**: Here is displayed the list of any events that are linked to this element, such as triggers for automatic actions.
- **Options**: These are configuration options of the *Area*:
  1. **Search**: By clicking here, Veronte Ops will center and zoom in on the area of the map where this *Area* is defined.
  2. **Select in map**: To link this operation element to a different area, click here and select it on the map.
  3. **Remove reference**: The user can remove the *Area* configuration by clicking here.

In addition, when clicking on the linked area, its description will appear with the name defined by the user and the events linked to it will also appear:

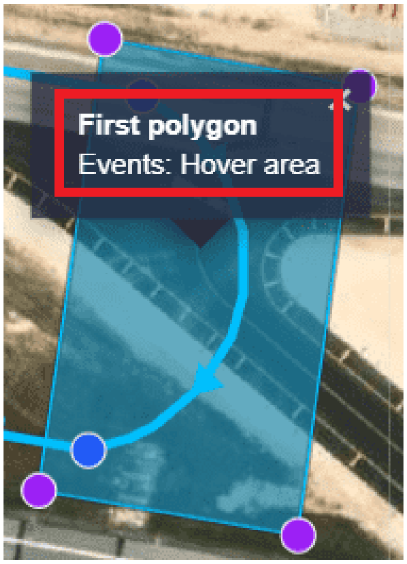
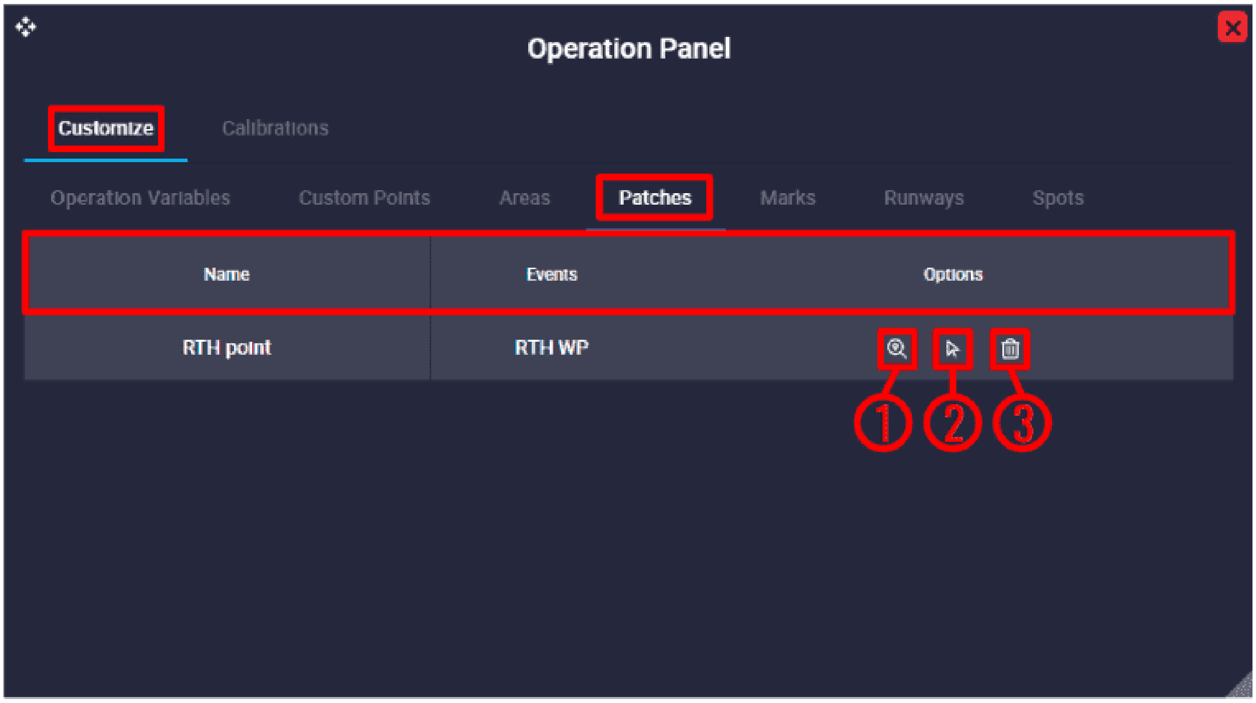


Fig. 161: **Area description**

3.3.1.1.4 Patches

A **Patch** is an operation element that can be linked to patches associated with waypoints, segments, arcs or orbits of the configured mission.

This tab has the same options and works exactly the same way as the previous section (*Areas section*).



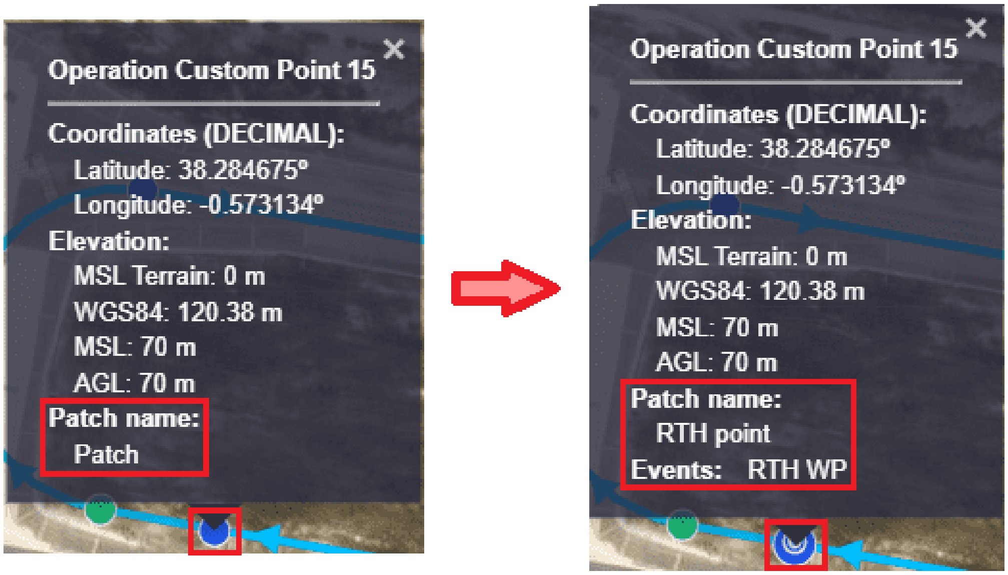
Name	Events	Options
RTH point	RTH WP	

Fig. 162: **Patches**

In addition, if the event that is linked to the *Patch* has an associated icon and the element of the mission is the patch of a **waypoint**, the icon will appear at this waypoint. An example is shown below:

Moreover, if the event that is linked to the *Patch* has an associated icon and the element of the mission is the patch of a **waypoint**, the icon will appear at this waypoint. In addition, when clicking on it, in its description will appear with patch name defined by the user and the events linked to it will also appear. An example is shown below:

Note: As this is a patch, the Operation Custom Point is not renamed as in the case of *Custom Points*, the name of the patch associated to this waypoint is renamed in the description.



Operation Custom Point 15

Coordinates (DECIMAL):
Latitude: 38.284675°
Longitude: -0.573134°
Elevation:
MSL Terrain: 0 m
WGS84: 120.38 m
MSL: 70 m
AGL: 70 m
Patch name:
Patch

Operation Custom Point 15

Coordinates (DECIMAL):
Latitude: 38.284675°
Longitude: -0.573134°
Elevation:
MSL Terrain: 0 m
WGS84: 120.38 m
MSL: 70 m
AGL: 70 m
Patch name:
RTH point
Events: RTH WP

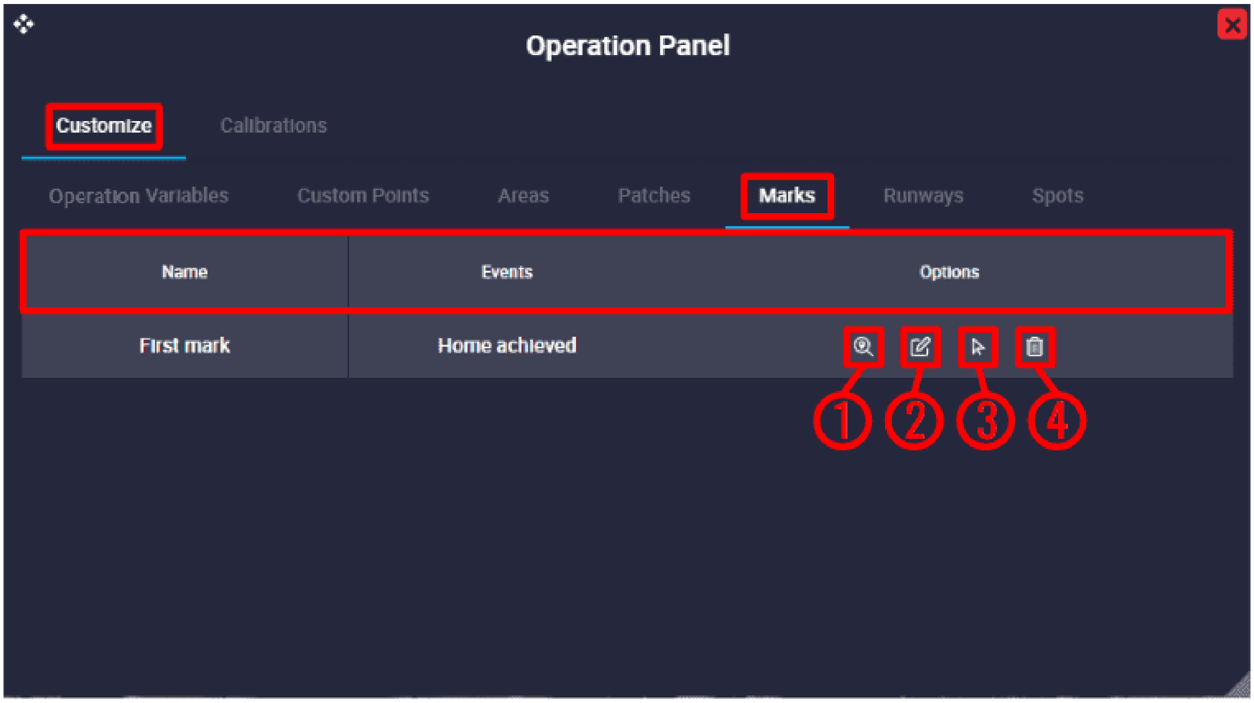
Fig. 163: **Patches - WP description**

3.3.1.1.5 Marks

A **Mark** is an operation element that can be linked to a mark (reference placed in a patch) of the configured mission.

The procedure for defining and configuring a mark is the same as described above in the *Areas section*.

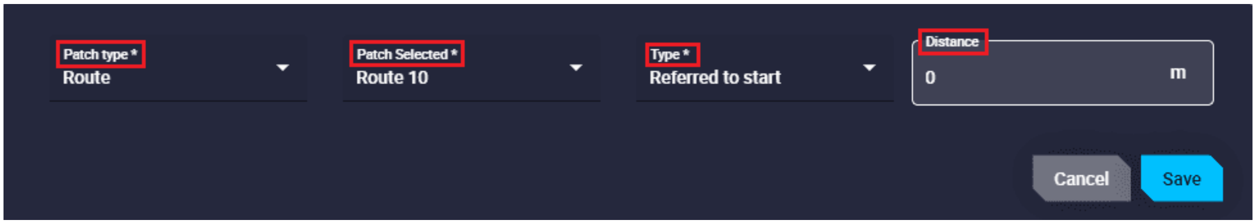
Once a *Mark* is configured, the following options will appear in the operation panel:



Name	Events	Options
First mark	Home achieved	

Fig. 164: **Marks**

- **Name**: Element identifier, this has been **defined in the 1x PDI Builder** software.
- **Events**: Here is displayed the list of any events that are linked to this mark, such as triggers for automatic actions.
- **Options**: These are configuration options of the *Mark*:
    1. **Search**: By clicking here, Veronte Ops will center and zoom in on the area of the map where this *Mark* is defined.
    2. **Edit/Create**:



Patch type * Route

Patch Selected * Route 10

Type * Referred to start

Distance 0 m

Fig. 165: **Marks - Edit**

- **Patch type**: The user can select different flight guidance phases where the marks will be placed: **Approach**, **Climbing**, **Route**, **Taxi**, **VTol** and **Rendezvous**. Except for Route patches, for the rest of the guidance phase, **patches are generated when the user**, or an automation, **activates them**. As the user cannot select these patches, as **they cannot be generated initially**, this option will automatically create the marking on the selected patch.
- **Patch Selected**: Most flight guidance phases have predefined patches with specific names. The user can select where the mark will be placed on those patches. A table summarising the available options is shown below.
- **Type**: Right now the only possible option is "*Referred to Start*" of the selected patch.

- **Distance**: Distance from the mark to the start of the patch.

Climbing and Approach guidances are defined as follows:

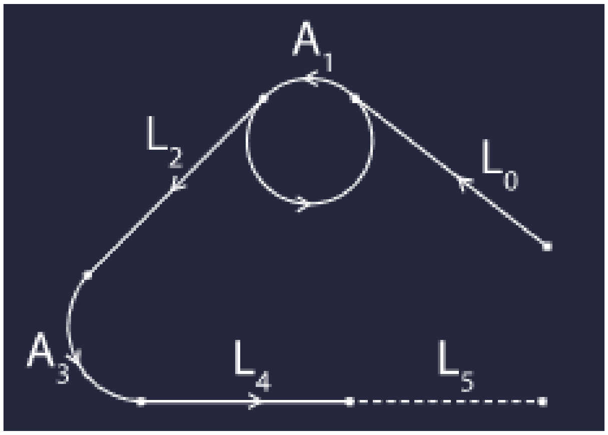


Fig. 166: **Marks - Approach patches**

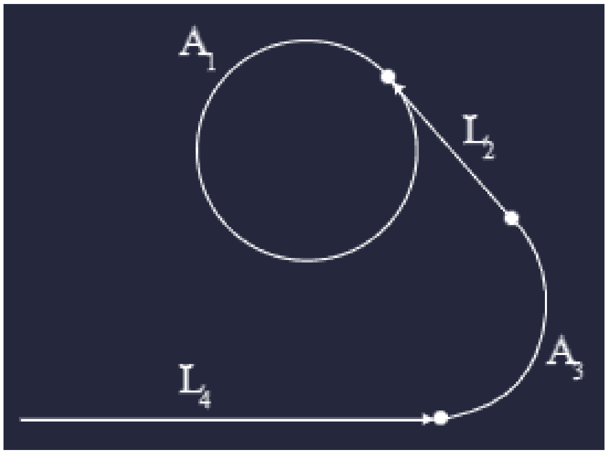


Fig. 167: **Marks - Climbing patches**

Approach	L0/A1/L2/A3/L4/L5
Climbing	L4/A3/L2/A1
Route	512 patches
Taxi	Taxi1/Taxi2
VTol	VTol1/VTol2/VTol3
Rendezvous	Rendezvous1/Rendezvous2/Rendezvous3

3. **Select in map**: To link this operation element to a different mark, click here and select it on the map.
4. **Remove reference**: The user can remove the *Mark* configuration by clicking here.

Moreover, if the event that is linked to the *Mark* has an associated icon, the icon will appear on that mark. In addition, when clicking on it, its description will appear with the name defined by the user and the events linked to it will also appear. An example is shown below:

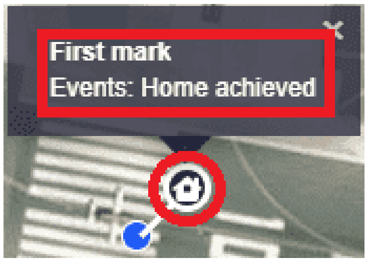
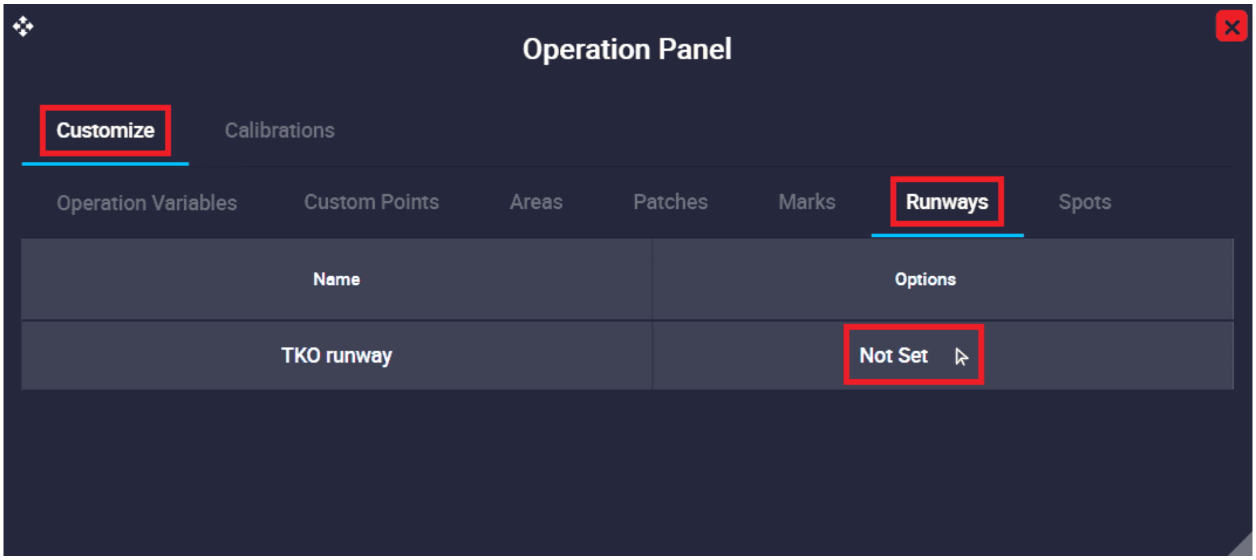


Fig. 168: **Marks - Icon and description**

3.3.1.1.6 Runways

Runways are operation elements that can be linked to the runways of the configured mission.

Like all other operation elements, *Runways* have to be **defined in 1x PDI Builder** and then **configured by selecting a runway from the map**.



Name	Options
TKO runway	Not Set

Fig. 169: **Runways**

The following configurable options will then appear in the operation panel:

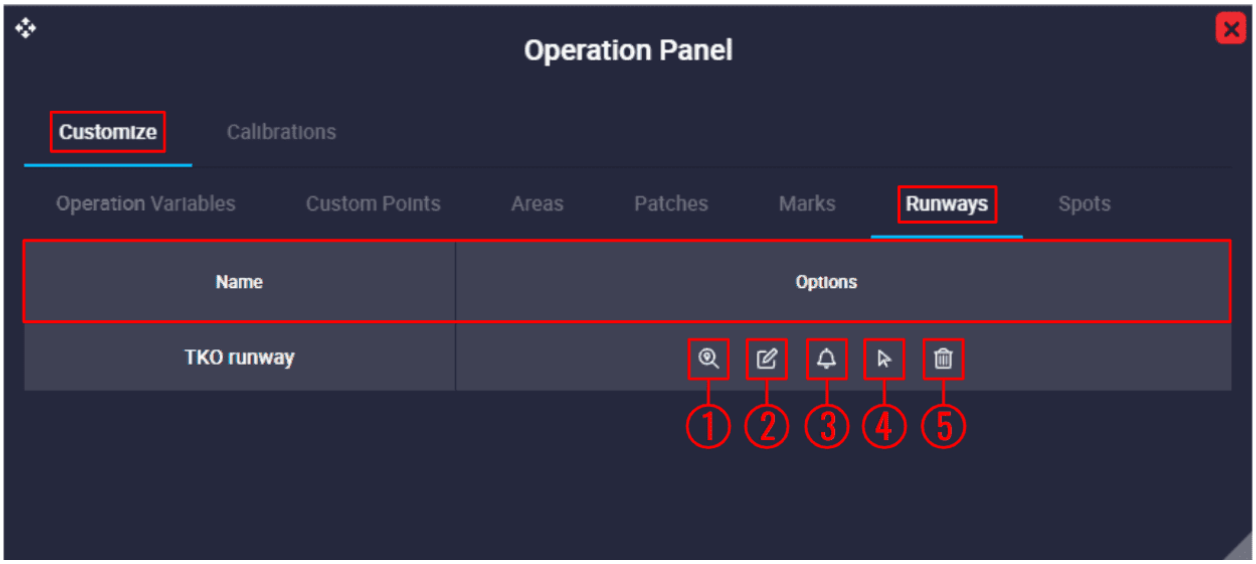


Fig. 170: **Runways configuration**

- **Name**: Element identifier, this has been **defined in the 1x PDI Builder** software.
- **Options**: These are configuration options of the *Runway*:
  1. **Search**: By clicking here, Veronte Ops will center and zoom in on the area of the map where this *Runway* is defined.
  2. **Edit**: By clicking here the user will be able to modify the runway settings. A detailed explanation of how to configure it can be found in *Mission toolbar section - Runway*.
  3. **Configure Alarms**: Alarms can be associated to *Runways*. A detailed explanation of how to configure them can be found in *Mission toolbar section - Runway*.
  4. **Select in map**: To link this operation element to a different runway, click here and select it on the map.
  5. **Remove reference**: The user can remove the *Runway* configuration by clicking here.

Moreover, by clicking on the linked runway, it will appear with the name of the configured *Runway*:

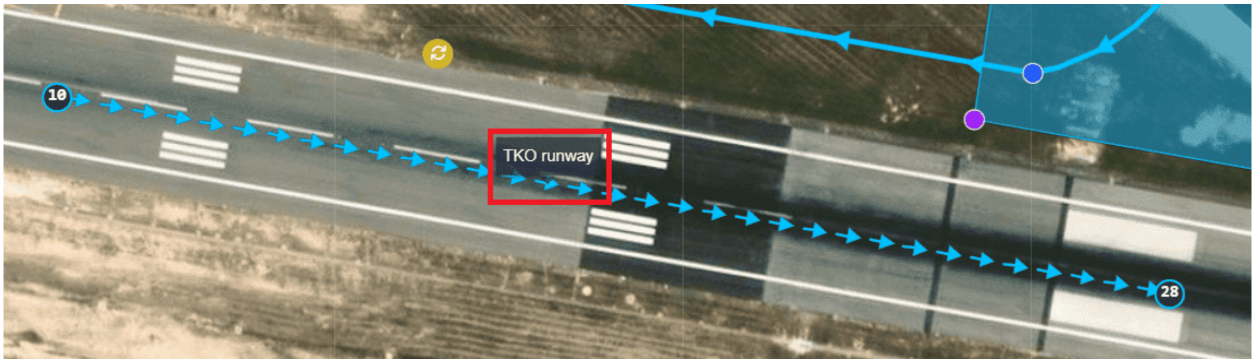


Fig. 171: **Runways description**

If the user clicks on the different points of the *Runway*, these are also renamed:

- *Start point of the runway*:

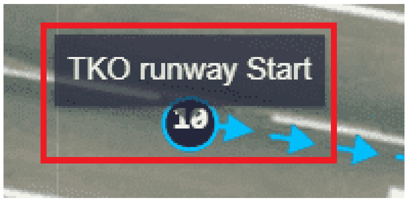


Fig. 172: **Runways - Start point**

- *End point of the runway*:

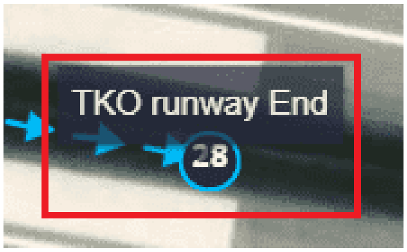


Fig. 173: **Runways - End point**

- *Loiter point of the runway*:

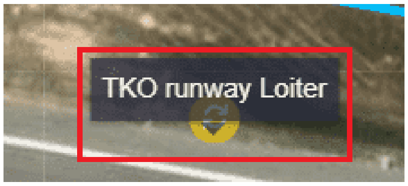


Fig. 174: **Runways - Loiter point**

3.3.1.1.7 Spots

Spots are operation elements that can be linked to the spots of the configured mission.

They function in the same way as the *Runways* operation elements:

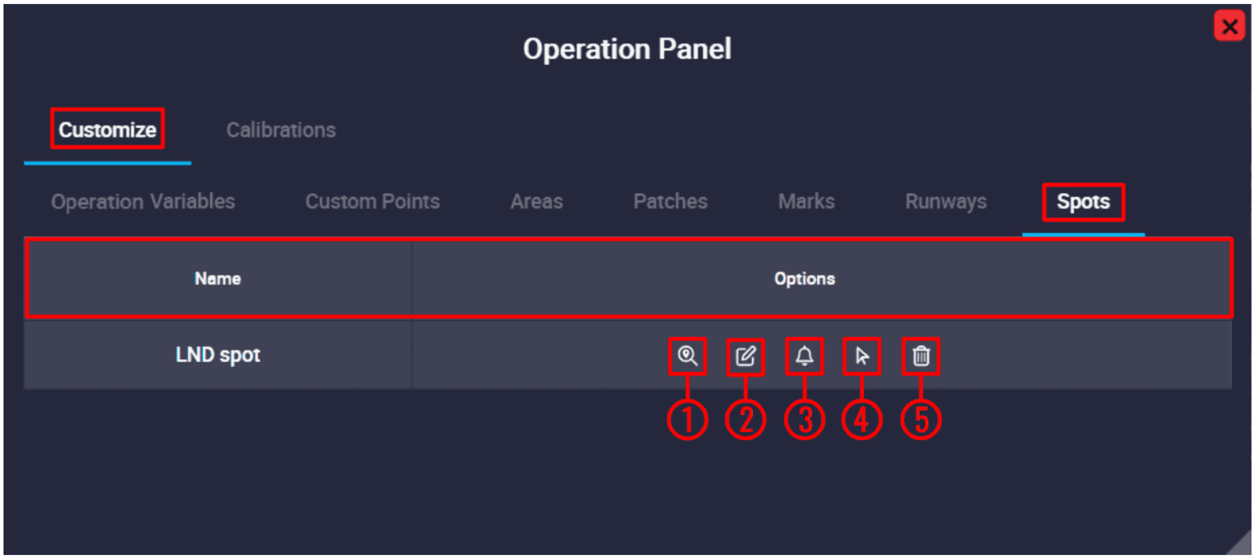


Fig. 175: **Spots configuration**

- **Name**: Element identifier, this has been **defined in the 1x PDI Builder** software.
- **Options**: These are configuration options of the *Spot*:
  1. **Search**: By clicking here, Veronte Ops will center and zoom in on the area of the map where this *Spot* is defined.
  2. **Edit**: By clicking here the user will be able to modify the spot settings. A detailed explanation of how to configure it can be found in *Mission toolbar section - Spot*.
  3. **Configure Alarms**: Alarms can be associated to *Spots*. A detailed explanation of how to configure them can be found in *Mission toolbar section - Spot*.
  4. **Select in map**: To link this operation element to a different spot, click here and select it on the map.
  5. **Remove reference**: The user can remove the *Spot* configuration by clicking here.

Moreover, by clicking on the linked spot, it will appear with the name of the configured *Spot*:

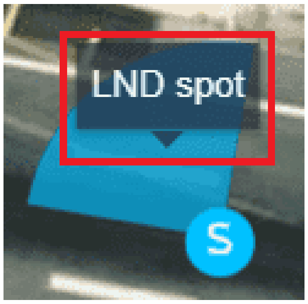


Fig. 176: **Spots description**

If the user clicks on the *spot loiter point*, it is also renamed:

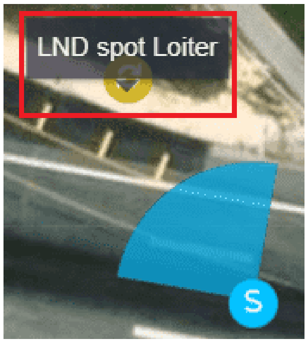


Fig. 177: **Spots - Loiter point**

3.3.1.2 Calibrations

In this tab, the user can carry out simple calibrations during a standard operation. This way, there is no need of modifying the configuration or building a specific automation.

Note: Some of the following calibrations can also be triggered automatically using Automations.

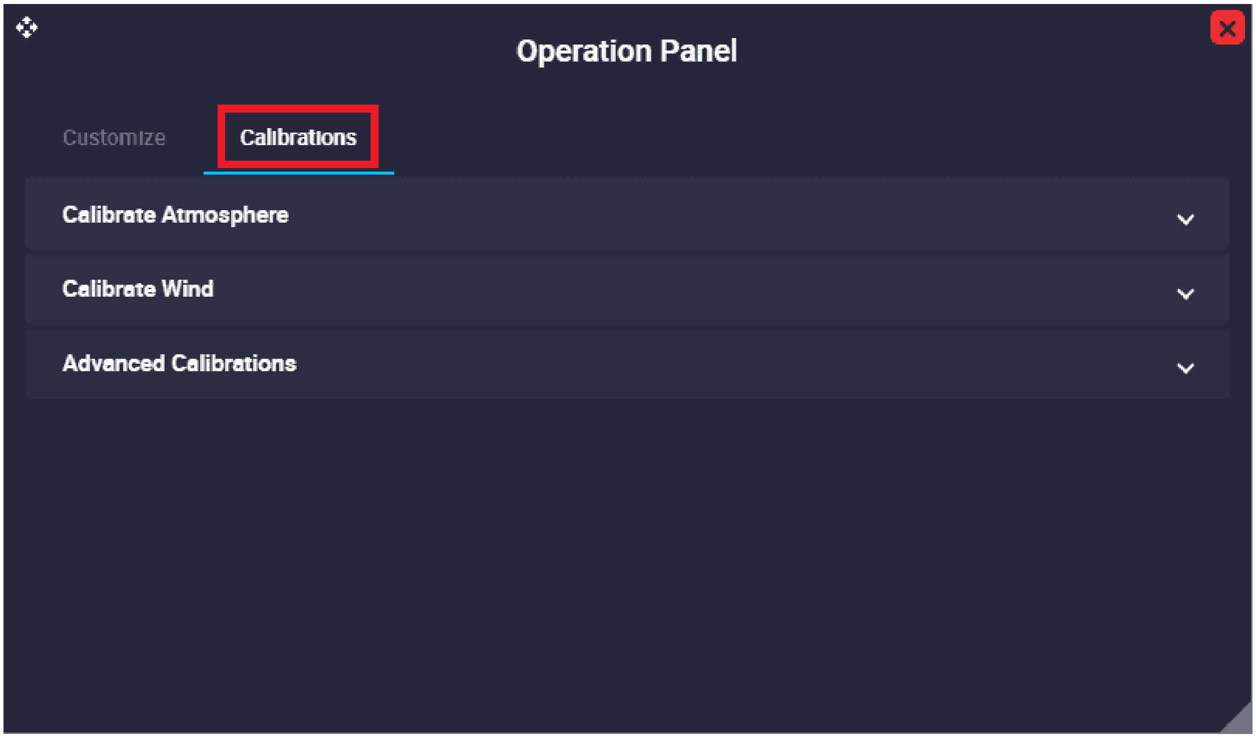


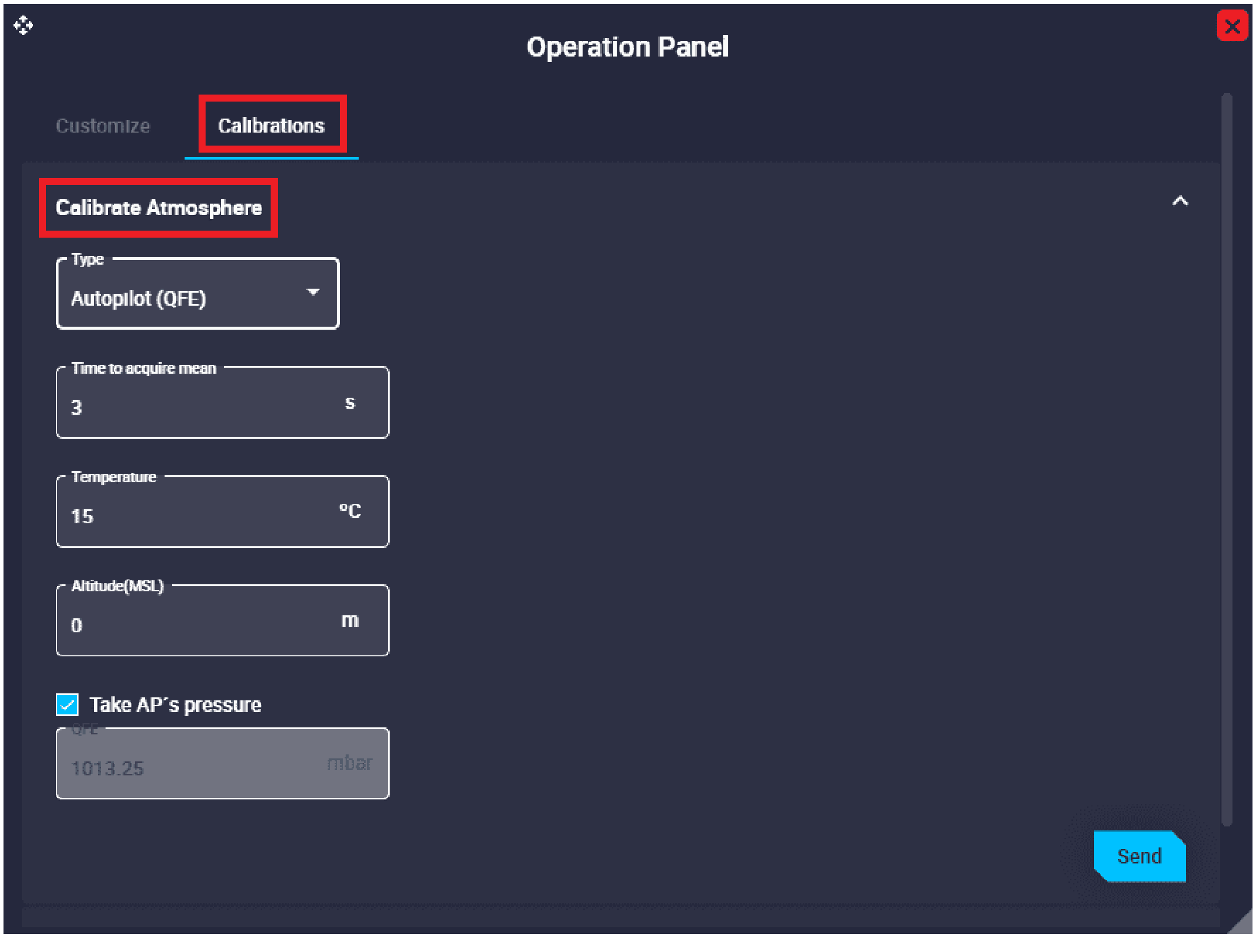
Fig. 178: **Operation panel - Calibrations tab**

Note: These calibrations will never modify the autopilot's current configuration: the changes are volatile, and will dissapear once the system is rebooted.

Warning: To send any of these calibrations, it is necessary to click on the 'Send' button.

3.3.1.2.1 Calibrate Atmosphere

Calibration for MSL calculation with barometric pressure.



Type: Autopilot (QFE)

Time to acquire mean: 3 s

Temperature: 15 °C

Altitude(MSL): 0 m

☑ Take AP's pressure

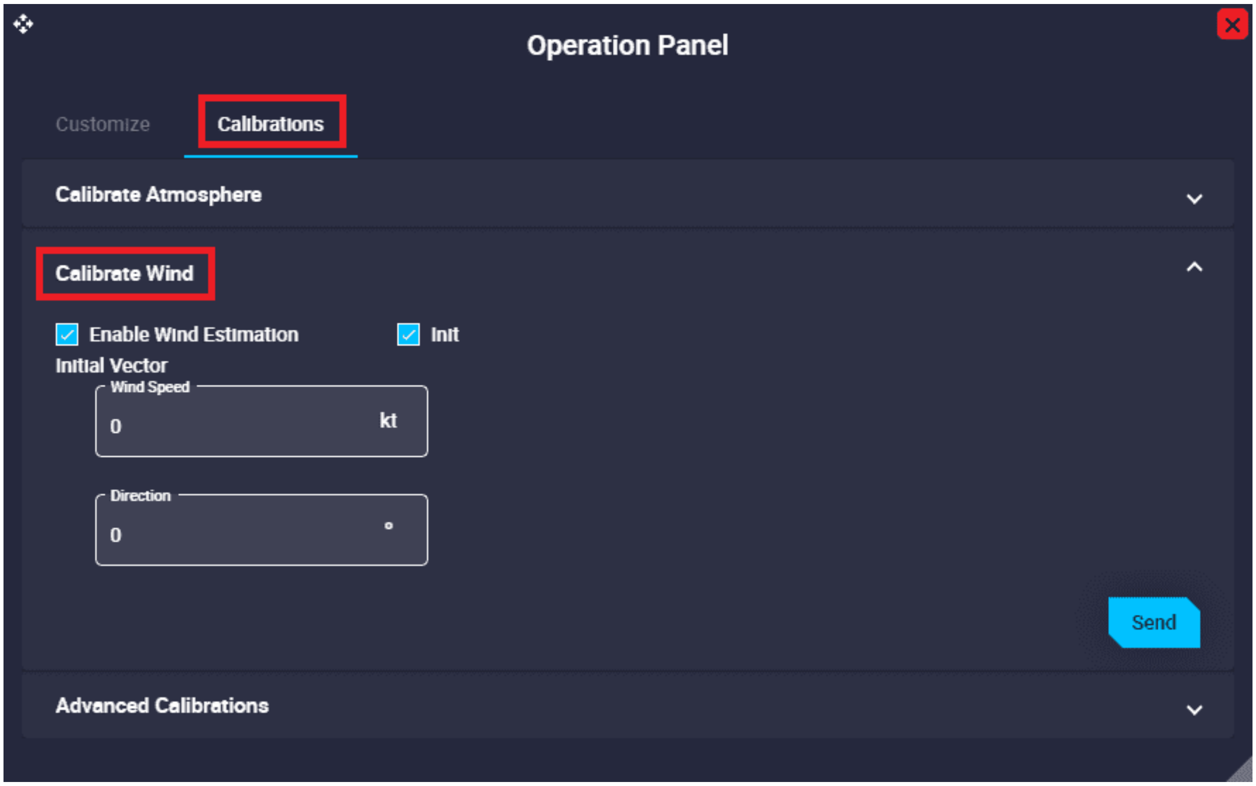
QFE: 1013.25 mbar

Fig. 179: **Calibrate Atmopshere**

- **Type**: QFE and QNH options are available.
- **Time to acquire mean**: Specified time during which the static pressure is read from the static pressure sensor.
- **Temperature**: Outside air temperature.
- **Altitude (MSL)**: Actual MSL altitude.
- **Take AP's pressure**: If enabled, static pressure will be selected from the autopilot measurement, otherwise users will must enter it manually.

3.3.1.2.2 Wind Calibration

This command allows to enter initial values for wind state and start wind estimation algorithm.



☑ Enable Wind Estimation ☑ Init

Initial Vector

Wind Speed: 0 kt

Direction: 0 °

Fig. 180: **Calibrate Wind**

- **Enable Wind Estimation**.
- **Init**: By enabling it, an initial wind vector can be set to a faster convergence of the estimation.
- **Wind Speed**: Module of the initial wind speed.
- **Direction**: Argument/Direction of the initial wind speed.

3.3.1.2.3 Advanced Calibration

The following are the advanced calibrations that can be performed by the user during operation:

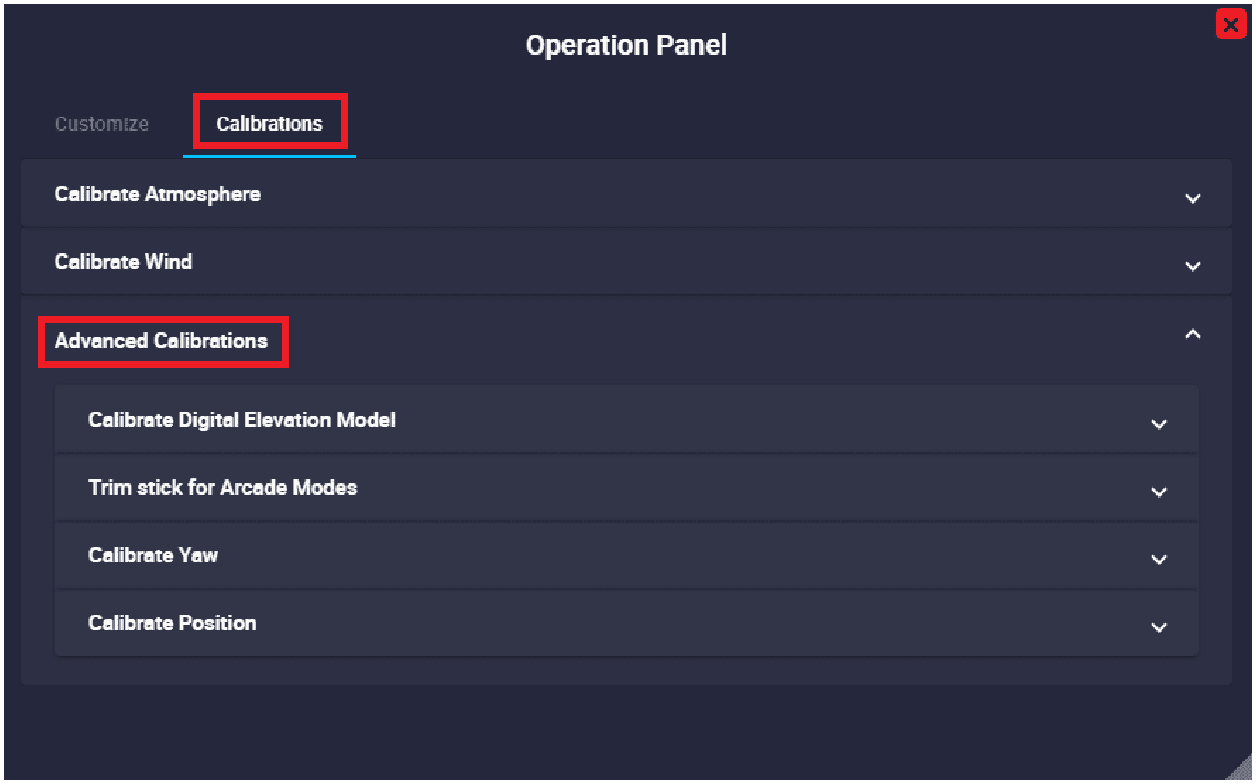
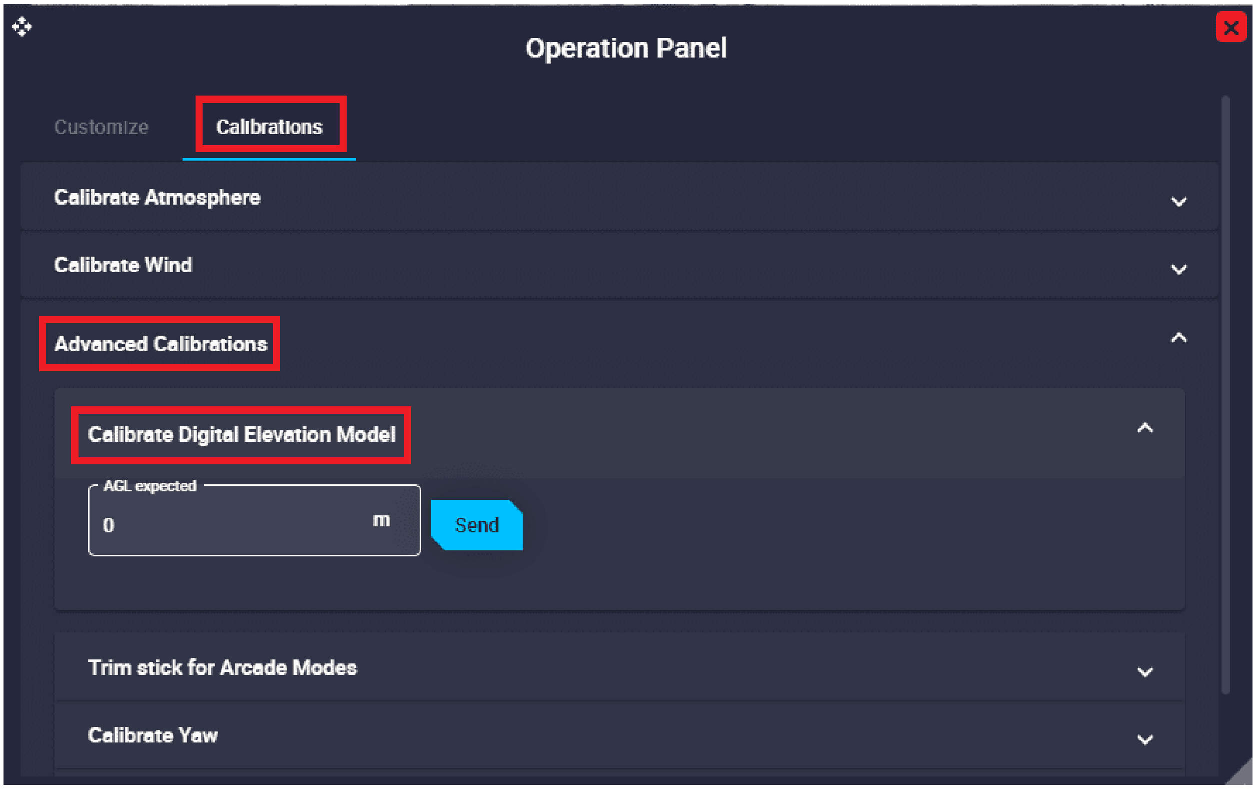


Fig. 181: **Advanced Calibrations**

- **Calibrate Digital Elevation Model (DEM)**

  Calibrate any offset that the current terrain model may have for the user's current position.

  > **Warning:** Always perform this action on the ground, unless an accurate estimation of current AGL is available.



AGL expected: 0 m

Fig. 182: **Advanced Calibrations - Calibrate DEM**

- **Trim stick for Arcade Modes**

  This command calibrates the current stick for arcade commands.

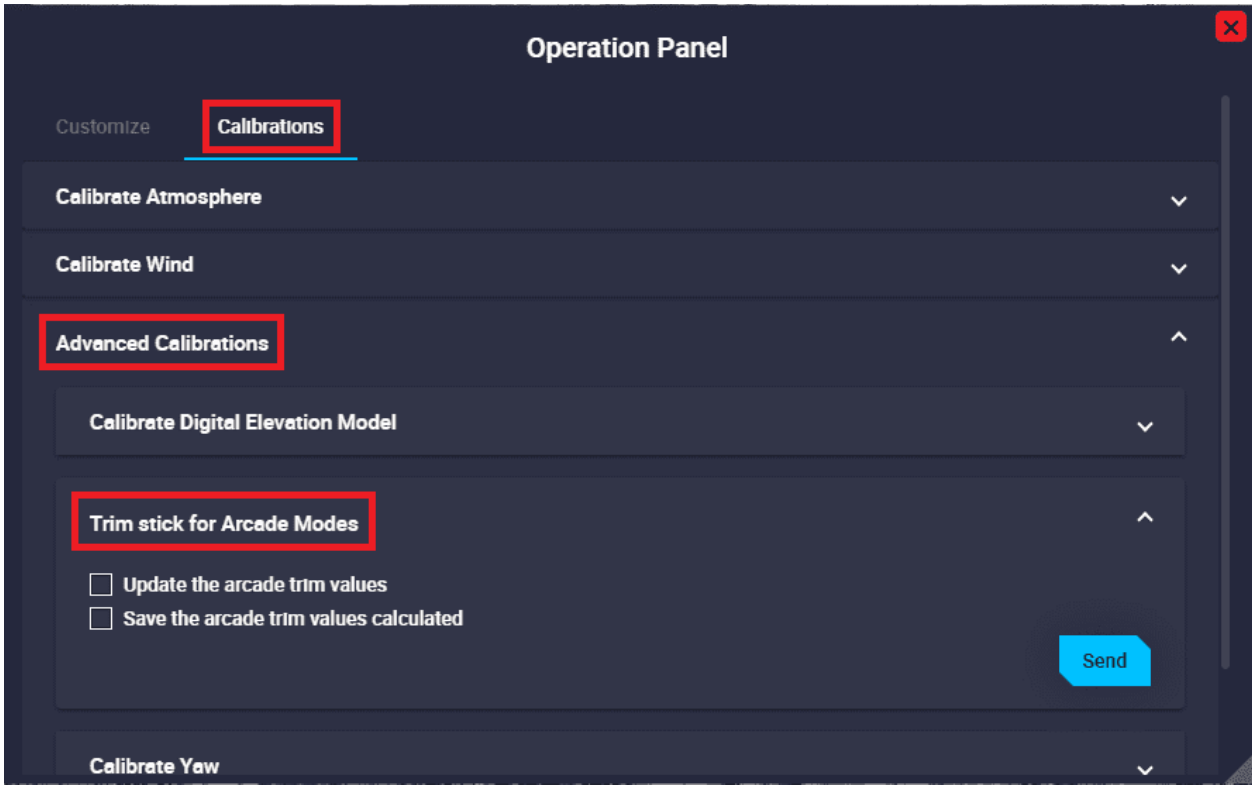

Operation Panel
Customize
Calibrations
Calibrate Atmosphere
Calibrate Wind
Advanced Calibrations
Calibrate Digital Elevation Model
Trim stick for Arcade Modes
☐ Update the arcade trim values
☐ Save the arcade trim values calculated
Send
Calibrate Yaw

Fig. 183: **Advanced Calibrations - Trim stick**

- **Calibrate Yaw**

  Allows to manually modify the Yaw Navigation state.

  > **Warning:** If there is any **Yaw sensor active** (i.e. Magnetometer), this command will **not work** since it will be automatically **overrided**.

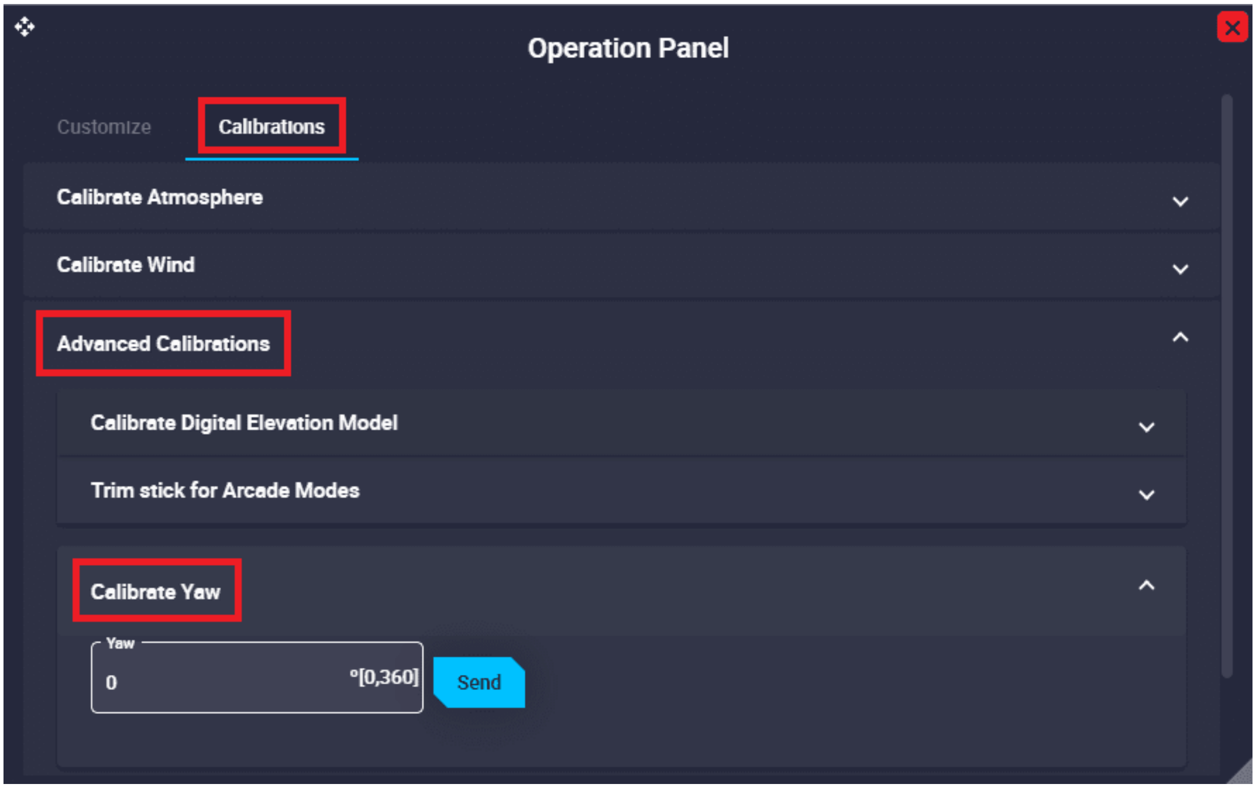


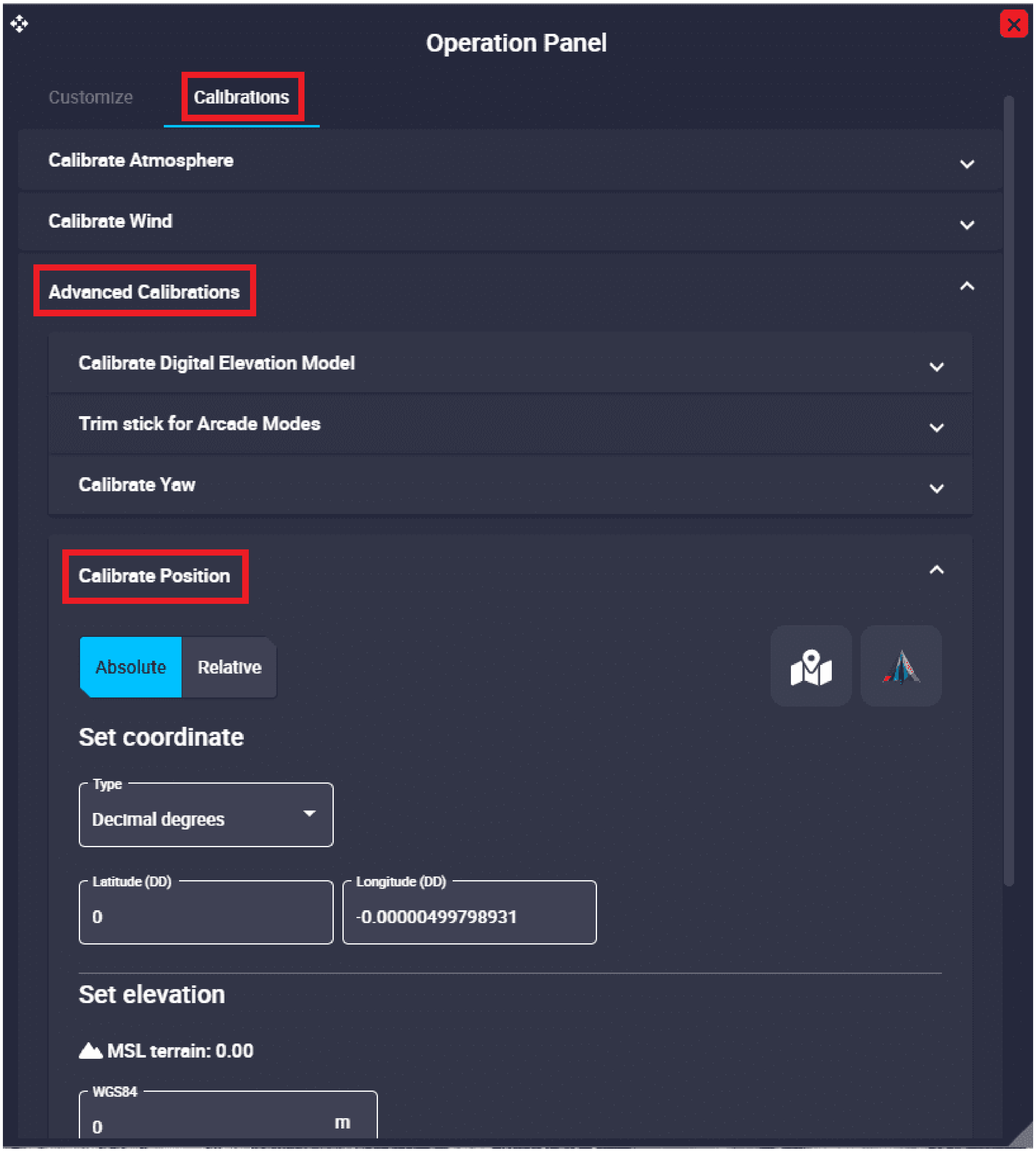
Fig. 184: **Advanced Calibrations - Calibrate Yaw**

- **Calibrate Position**

  Allows to manually modify the Position Navigation state.

  The configurable parameters of the position calibration are the same as for configuring the position of a **waypoint**. So they have already been described in detail earlier in the *Waypoint* section of this manual.

  > **Warning:** If there is any **absolute positioning sensor active** (i.e. GNSS), this command will **not work** since it will be automatically **overrided**.



Type: Decimal degrees

Latitude (DD): 0

Longitude (DD): -0.00000499798931

MSL terrain: 0.00

WGS84: 0 m

Fig. 185: **Advanced Calibrations - Calibrate Position**

3.3.2 Operations

By clicking here, a list of all operations loaded in Veronte Ops will appear. The current operation is the one that is selected, the one shown in blue.

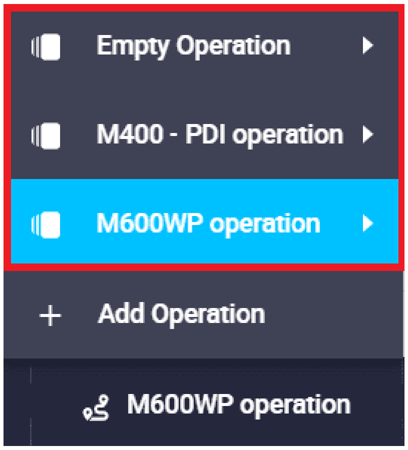


Fig. 186: **Operations**

The following options are available for each operation:

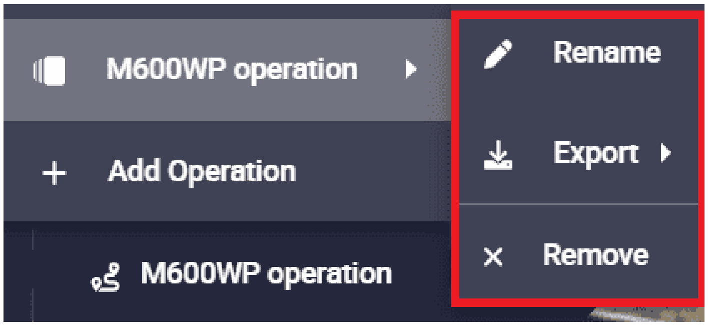


Fig. 187: **Operation options**

- **Rename**: The user can rename the operation as desire.
- **Export**: The current operation can be exported, the available formats are: `ZIP`, `KML` and `GEOJSON`.
- **Remove**: Clicking here will delete the selected operation.

Note: It is possible to delete several or all operations at once from the **Operation manager menu** of the **Status bar**, click *here* for more infromation.

Adding an operation

It is posible to create a new operation by simply clicking on '**Add Operation**'.

The user can choose between adding an empty operation or importing one from the laptop, which has been previously exported. The available formats for importing an operation are the same as for exporting it: `ZIP`, `KML` and `GEOJSON`.

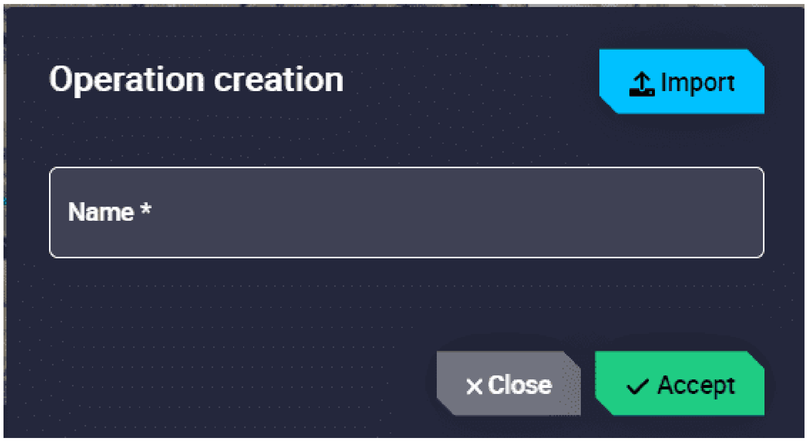
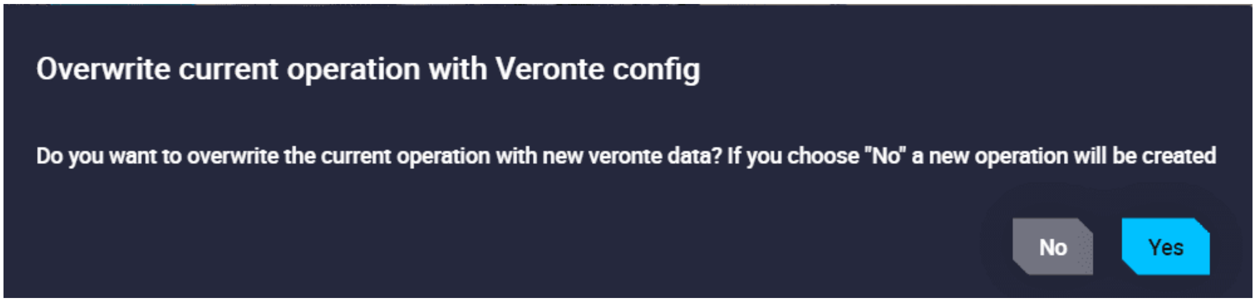


Fig. 188: **Operation creation**

Note: When **a configuration is saved in the 1x PDI Builder software**, the following message will appear to inform the user that there is a new operation loaded in the autopilot 1x:


Overwrite current operation with Veronte config

Do you want to overwrite the current operation with new veronte data? If you choose "No" a new operation will be created

Fig. 189: **Operation overwrite/new**

- If the user does not select anything, **after 10 seconds** this message will disappear and a **new operation will be created**.
- If the user selects **NO**, a **new operation** will also be created, as described in the message.
- If the user selects **YES**, no new operation will be created and the changes saved in the 1x PDI Builder software will be applied to the current operation, i.e. the **current operation will be overwritten**.

3.3.3 Operation actions

Revert Operation changes

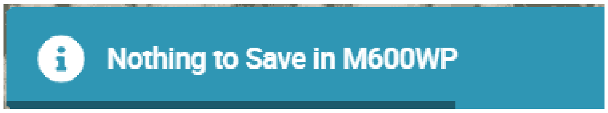
- When a change is made, it is possible to revert it by pressing this button. This is only possible **if the changes have not yet been saved**.

Save Operation

- To apply any change it is necessary to save it by pressing this button.

Upload to '*(Platform name)*'

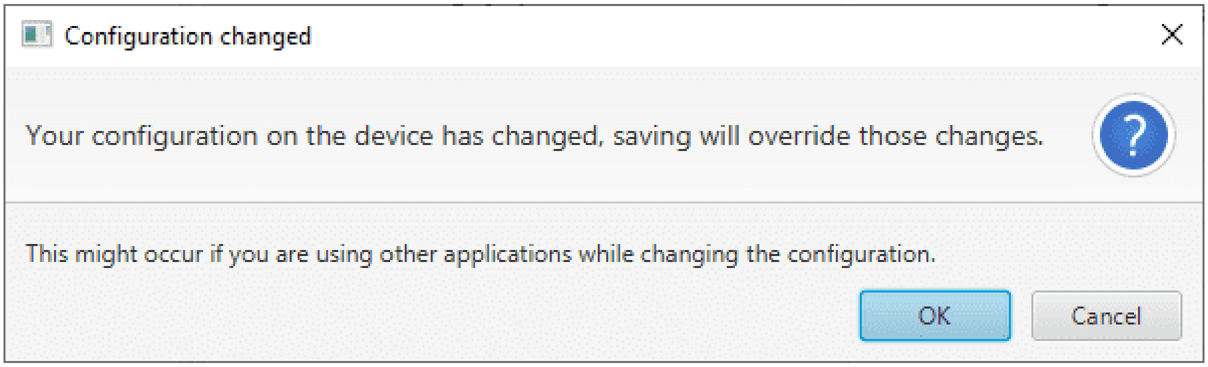
- To update the operation loaded on the autopilot with the **new saved changes**, click on this button.
- If there is no change to upload to the operation configuration, the following message will appear:



Nothing to Save in M600WP

Fig. 190: **Nothing to Save in '…'**

Caution: When **1x PDI Builder** opens the configuration (i.e., 'Open 1xVeronte' has already been clicked), it takes a snapshot of the configuration inside the Veronte Autopilot 1x. This implies that if any other tool (in this case Veronte Ops) modifies the configuration (in this case the operation), it will be modifying the configuration inside the autopilot, but not the snapshot shown in the 1x PDI Builder software, so when saving from this software, the intermediate changes would be overwritten. Therefore, changes made in **Veronte Ops** will not be saved.



Configuration changed

Your configuration on the device has changed, saving will override those changes.

This might occur if you are using other applications while changing the configuration.

Fig. 191: **Configuration override message**

3.4 Platform

This panel shows information from the linked Veronte Autopilots 1x.

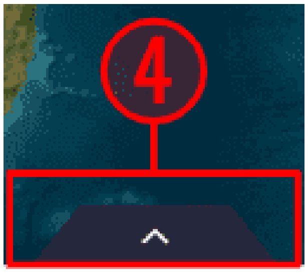
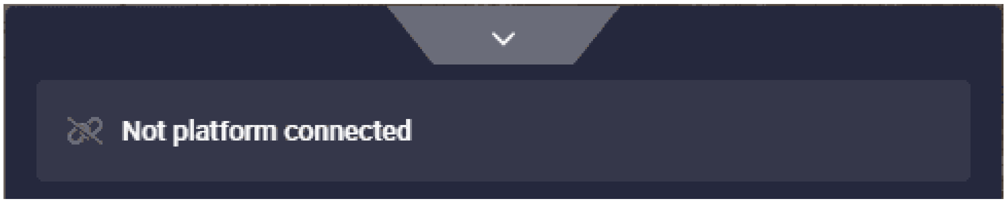


Fig. 192: **Platform list**

3.4.1 Platform connection status

This menu allows the user to check which autopilot 1x is connected and its **connection status**:

- **Not connected**



Not platform connected

Fig. 193: **Platform list - Not connected**

- **Connected**:

  Even if an autopilot 1x is connected, until it is selected by the user, Veronte Ops will operate as if no autopilot is connected:

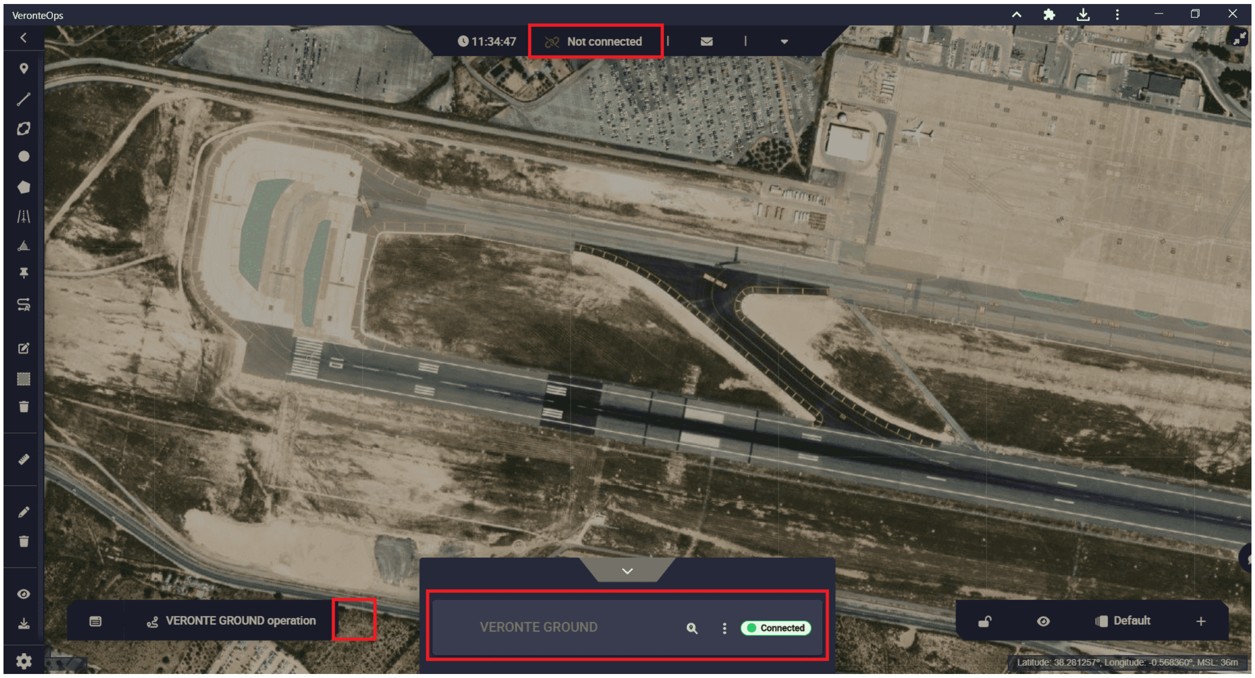


Fig. 194: **Platform list - Connected but not selected**

Once Veronte Autopilot is **connected and selected**, Veronte Ops appears as shown in the figure below:

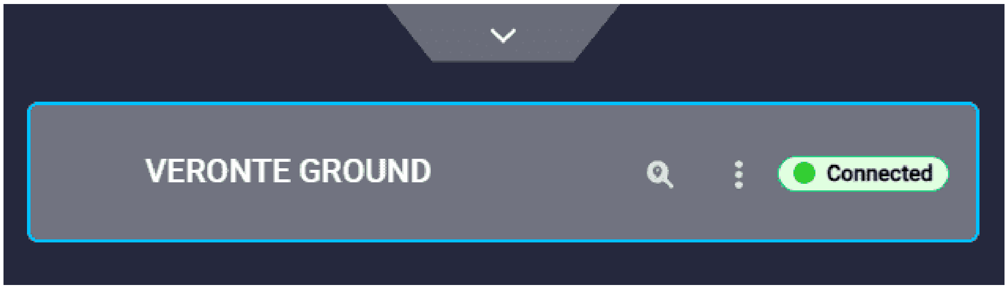


Fig. 195: **Platform list - Connected and selected**

- **Disconnected**:

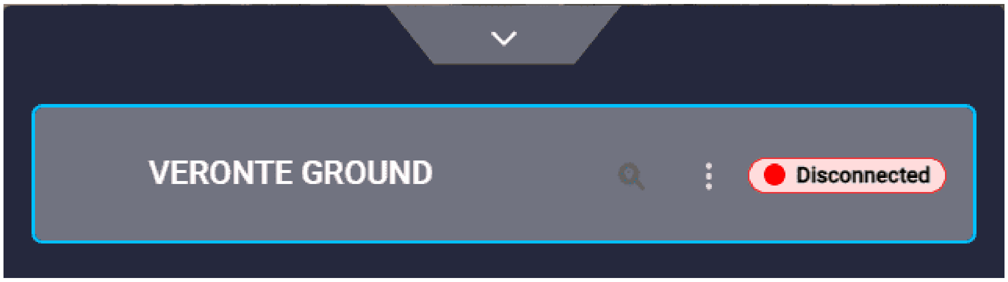


Fig. 196: **Platform list - Disonnected**

- **Maintenance mode**: By **placing** the mouse cursor over the ⚠ icon, a message appears indicating that the autopilot is in maintence mode:

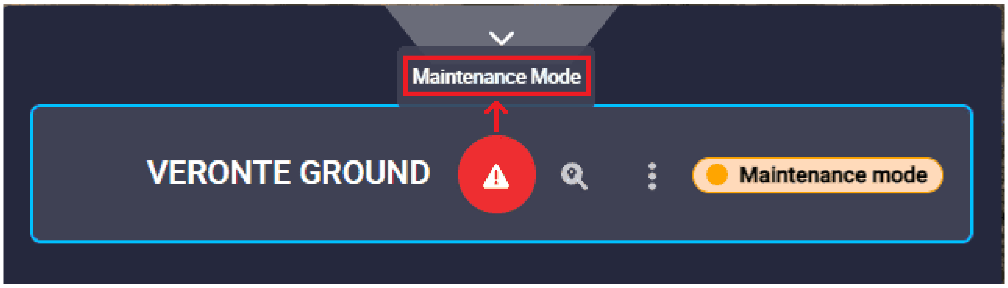
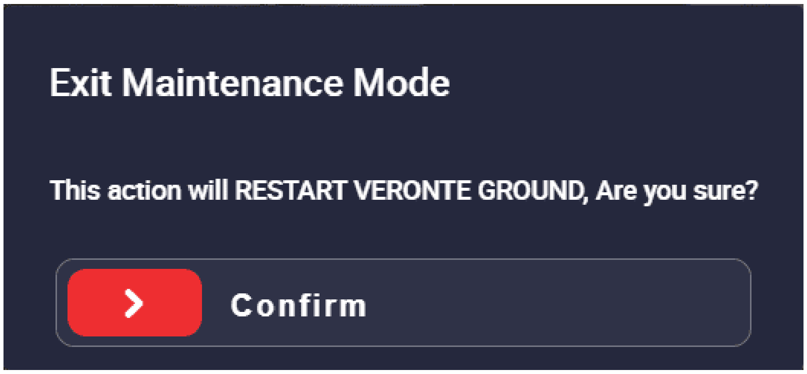


Fig. 197: **Platform list - Maintenance mode**

It is possible to exit of maintenance mode from this menu by **clicking** on the ⚠ icon. Then, the following confimation message will appear:

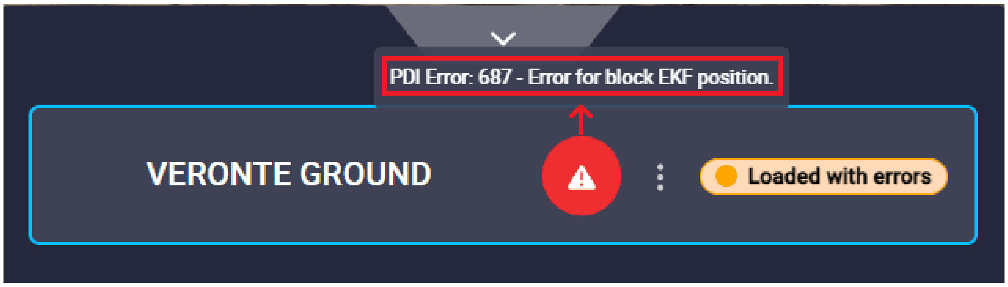


Exit Maintenance Mode

This action will RESTART VERONTE GROUND, Are you sure?

Fig. 198: **Platform list - Exit of maintenance mode**

- **Maintenance mode (loaded with errors)**: In this case, by placing the mouse cursor over the ⚠ icon, Veronte Ops will report the **ID of the PDI error and a brief description of the error**.



PDI Error: 687 - Error for block EKF position.

Fig. 199: **Platform list - Maintenance mode (loaded with errors)**

3.4.2 Platform actions

Moreover, when in Veronte Ops the **autopilot 1x is displayed in any connection state other than 'not connected'**, the following actions appear in this menu:

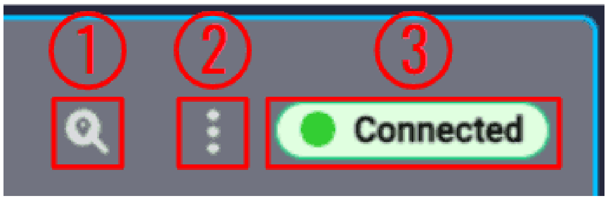


Fig. 200: **Platform list actions**

1. **Search & follow**: This action searchs the platform's position and centers it on the map.

   Note: This action is **not available** when **autopilot 1x** is in '**disconnected**' state.

2. **Options**

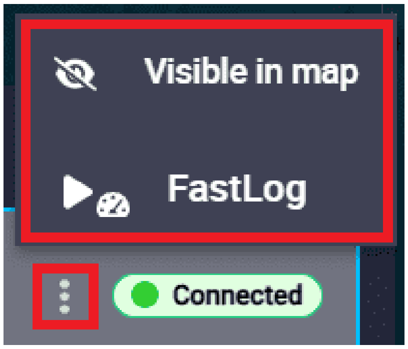


Fig. 201: **Platform options**

- **Visible/Invisible in map**: When the icon is ⊘, the platform icon is visible on the map, when the icon is 👁, the platform does not appear on the map. An example is shown below:

  Fig. 202: **Platform options - Visible/Invisible in map**

- **FastLog**: By **pressing this button**, the Veronte Autopilot 1x will **start recording the fastlog** and this option will be as shown in the figure below:

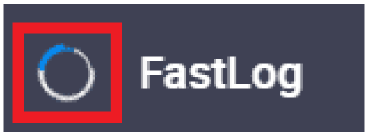
  

  Fig. 203: **Platform options - FastLog recording**

  To **stop fastlog recording**, simply **click this button again**.

  For more information on Fast Log, see the Telemetry section of the **1x PDI Builder** user manual.

3. **Minimize/maximize** this pill: By clicking here, this 'pill' will be minimized/maximized.

3.4.3 Platform list

When **more than one Veronte 1x Autopilot is connected**, either by radio link or directly connected to the laptop, **they will all appear here.**

The **user must then select one of them to operate** it, i.e. to modify its operation, mission, etc.

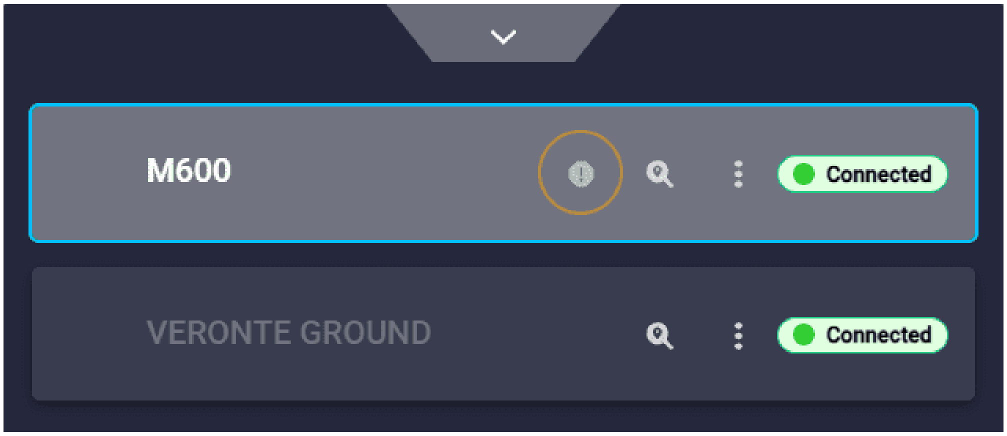


Fig. 204: **Platform list - 2 Veronte Autopilots 1x connected**

In the above figure, the following things can be observed:

- The selected platform is the one called: ‘*M600*’.
- The ‘M600’ unit has a **limited operation licence**.

  By **placing** the mouse cursor over the ❗ icon, a message appears indicating that the autopilot has a limited operation licence:

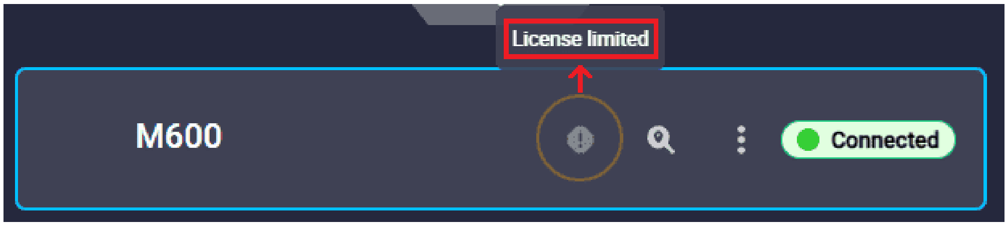
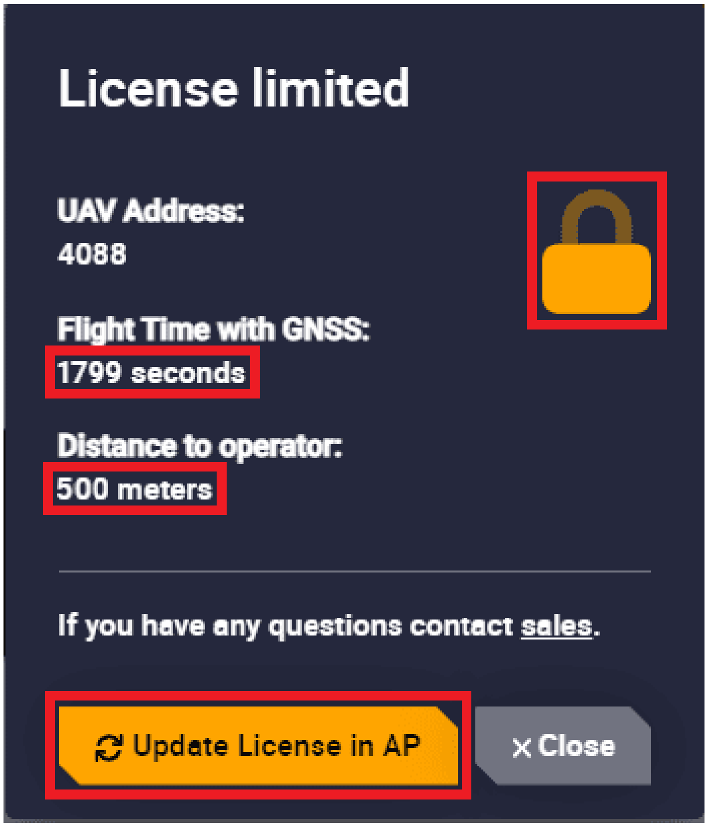


Fig. 205: **Platform list - Operation License limited**

  By **clicking** on this ❗ icon, the following information message will appear:



License limited

UAV Address:
4088

Flight Time with GNSS:
1799 seconds

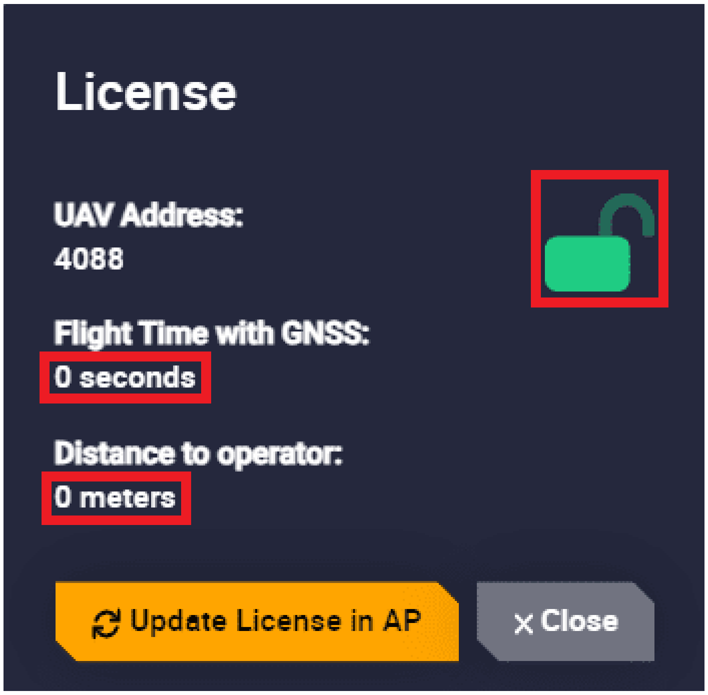
Distance to operator:
500 meters

If you have any questions contact sales.

Fig. 206: **Platform list - Operation License limited message**

Clicking on the button “**Upgrade License in AP**”, if the users have the **license activated**, Veronte Ops will be updated and they will be able to **operate without limitation**.

In this case, this message changes and the padlock opens and turns green:



License

UAV Address:
4088

Flight Time with GNSS:
0 seconds

Distance to operator:
0 meters

Fig. 207: **Platform list - Operation License updated message**

However, if users do **not have the licence activated**, they will continue to have **limited operation**, in which case they should contact sales@embention.com.

For more information on this operation license, see Limited Operation Firmware section of the **1x Hardware Manual**.

3.5 Workspace

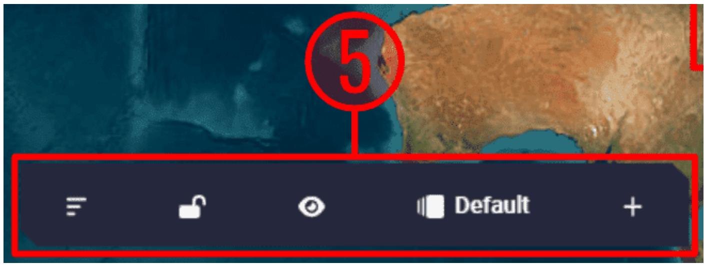


Fig. 208: **Workspace toolbar**

Workspace settings allow the user to customize any information to be displayed on the screen for monitoring the operation.

Attention: Although **Veronte Ops cannot be extended to multiple screens**, it is possible to **open more than one Veronte Ops** in order to display all the widgets necessary for the operation.

3.5.1 Map options

The map widget configures the background map that appears in Veronte Ops screen.

By **right clicking** on the map the following map options are available:

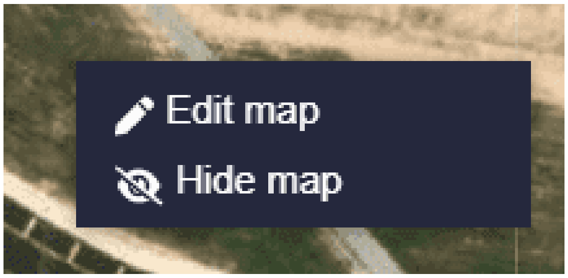
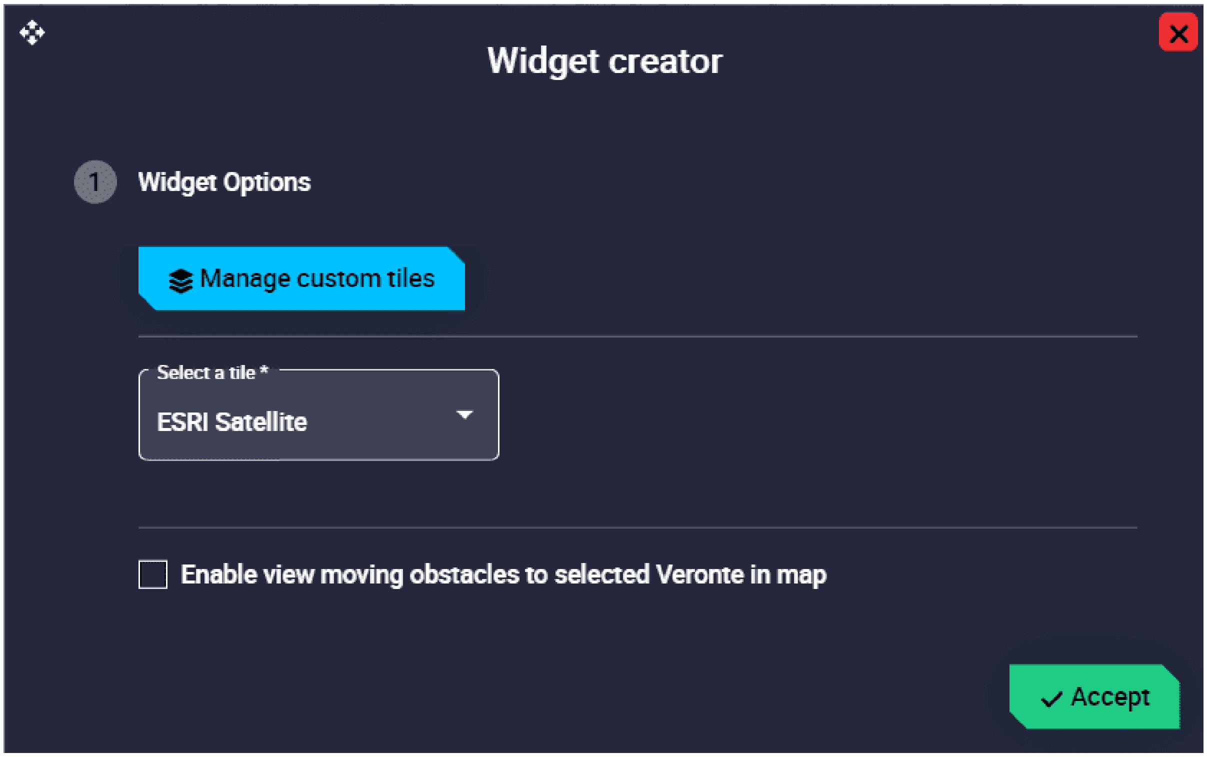


Fig. 209: **Map options**

- **Edit map**: In this menu the following options can be configured:

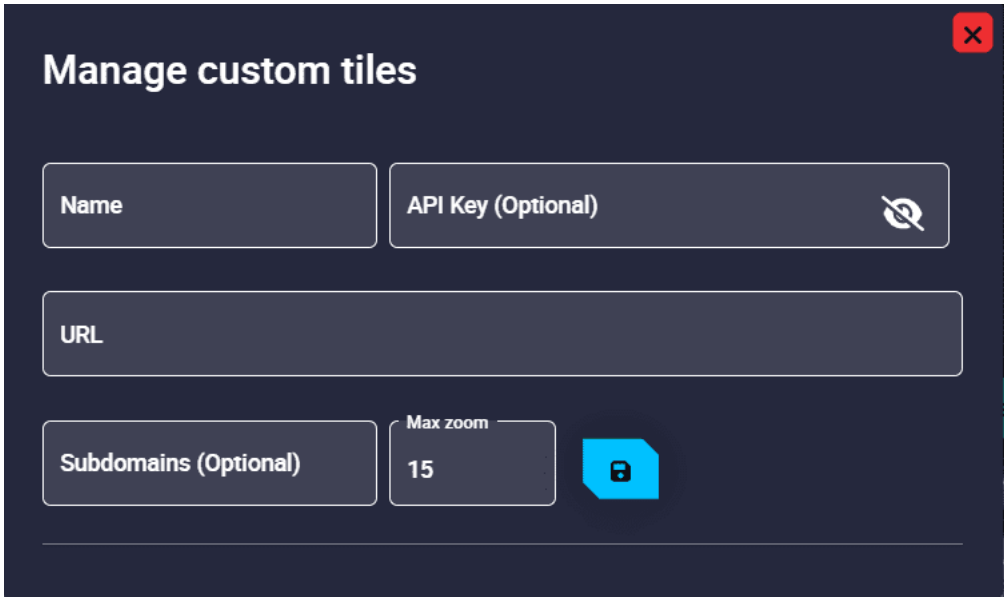


Select a tile *: ESRI Satellite

☐ Enable view moving obstacles to selected Veronte in map

Fig. 210: **Edit map option**

  - **Manage custom tiles**: This menu allows the user to add and manage their own map tiles.



Max zoom
15

Fig. 211: **Manage custom tiles**

  - **Select a tile**: It is possible to select the map provider from a number of options.
  - **Enable view moving obstacles to selected Veronte in map**
- **Hide map**: The map will be hidden. To show it again, go to '**Main Widgets' menu** and select 'Map'.

In addition, **double-clicking** on the map will **zoom in** on the area where it is located.

Furtheremore, the map can be minimized/maximized by clicking on the icon in the top right corner of the application. An example is shown below:

Fig. 212: **Minimize/Maximize map**

3.5.2 Workspace toolbar

The workspace toolbar is divided into 5 different 'parts':

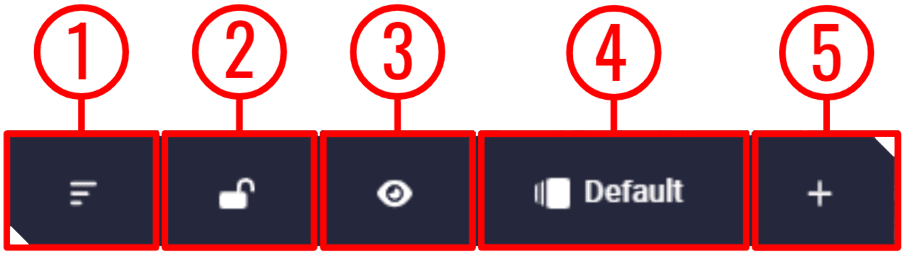


Fig. 213: **Workspace toolbar parts**

1. **Sort widgets**: With this button it is possible to sort the widgets, i.e. the user can place one widget on top of another.

To do this, click on this button and a 'sorting panel' will appear for the user to sort widgets, so that the first in the list will be on top of the second, the second on top of the third and so on.

For ease of use, the widget selected for sorting will be outlined in blue, as shown in the example below:

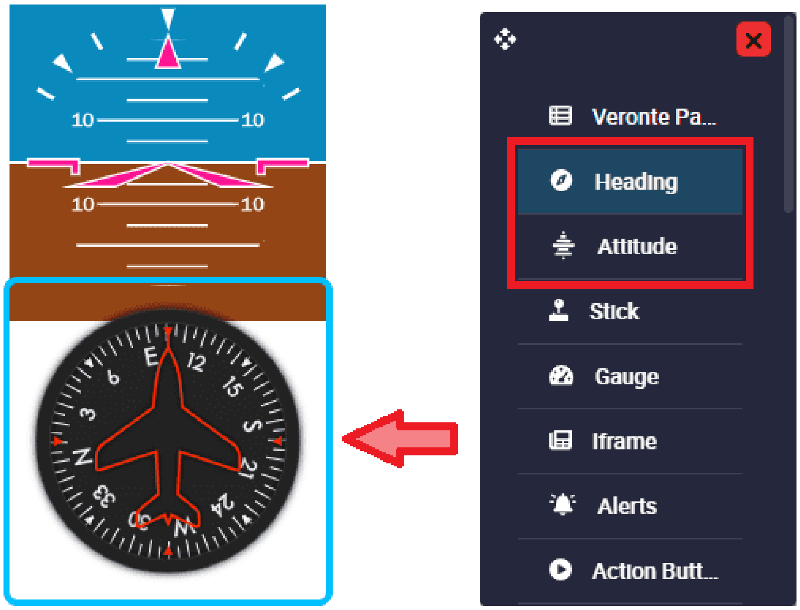


Fig. 214: **Sort widgets**

In this example, 'Heading widget' is selected and is ordered above the 'Attitude widget'.

> **Warning:** The **map** will always be at the **back** (the last widget in the list), except when minimized, which can be sorted as desired.

2. **Lock/Unlock widgets**: When widgets are locked, users will not be able to move them.
3. **Show/Hide widgets**: Users can choose to show/hide **all widgets** by pressing this button.
4. *Workspaces*: Users can have different workspaces for different missions, operations, tests, etc.
5. *Widgets*: Veronte Ops offers several applications to display parameters and variables in real time of the flight mission.

3.5.2.1 Workspaces

By clicking here, a list of all workspaces loaded in Veronte Ops will appear. The current workspace is the one that is selected, the one shown in blue.

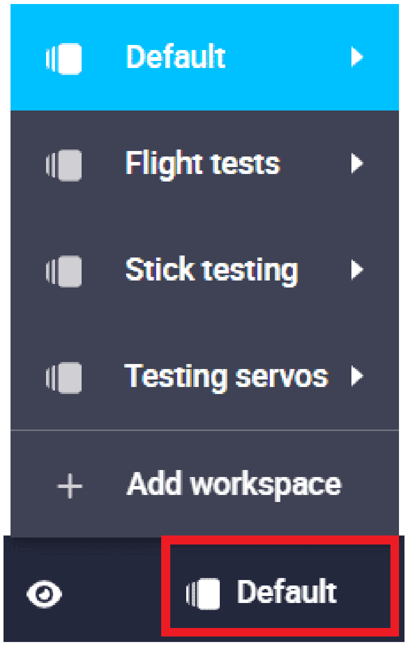


Fig. 215: **Workspaces**

The following options are available for each workspace:

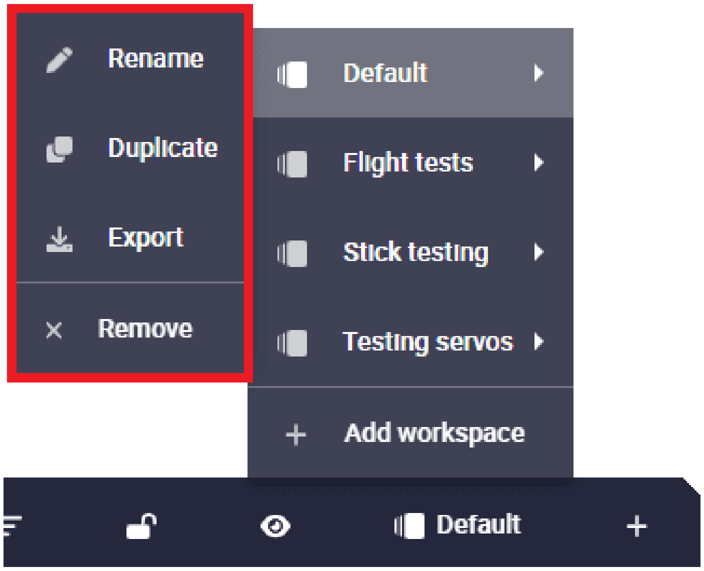


Fig. 216: **Workspaces options**

- **Rename**: The user can rename the workspace as desire.
- **Duplicate**: Duplicates this workspace.
- **Export**: The current workspace can be exported. This file is exported in `.json` format.
- **Remove**: Clicking here will delete the selected workspace.

Note: It is possible to delete several or all workspaces at once from the **Workspace manager menu** of the

Status bar, click *here* for more infromation.

Adding a workspace

It is posible to create a new workspace by simply clicking on '**Add workspace**'.

The user can choose between adding an empty workspace or importing one from the laptop, which has been previously exported. To **import** a workspace, the format file must be a `.json`.

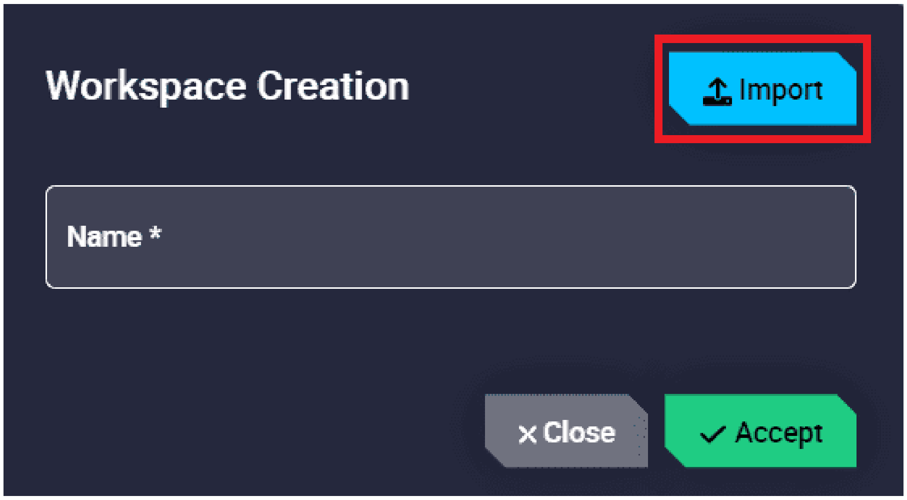


Fig. 217: **Add workspace**

3.5.2.2 Widgets

By clicking here, the user will see different widget menus sorted by categories.

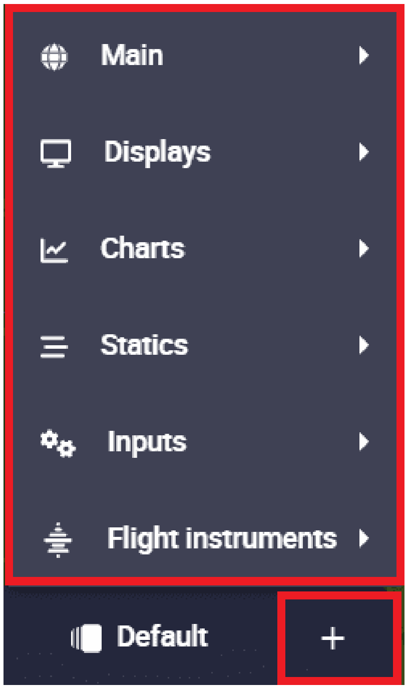


Fig. 218: **Widgets**

To display any widget on the map, just search for the desired widget and configure it.

Warning: In order for the widgets to correctly receive data from the variable they represent, i.e. the variable that has been selected in their configuration, it is necessary that this variable has been added to the **Data to Vapp** telemetry vector in the telemetry configuration of the **1x PDI Builder** software. For more information, see the Data to Vapp -> Telemetry section of the **1x PDI Builder** user manual.

Therefore, users should add to that telemetry vector all normally used variables, as well as those variables of the current configuration that are expected to be used during operation.

Otherwise, if the variable configured for a widget is not present in the telemetry configuration of the PDI, the widget will appear with a red triangle (warning icon), which means that the variable selected for this widget is not being received in Veronte Ops:

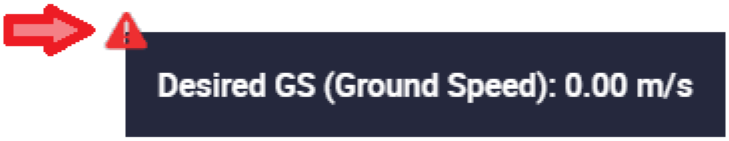


Fig. 219: **Not receiving telemetry in this widget**

To fix this, users can simply add this variable to the **complementary vector telemetry** by *uploading the current operation* to the platform configuration. However, this complementary vector telemetry is **always** running at a frequency of **10 Hz** (not configurable) and the variables are sent uncompressed.

It is therefore **recommended** to add the variables to the **Data to Vapp** telemetry vector to configure the desired frequency, the compression/uncompression of the variables, etc.

Widgets common configuration

Warning: This does not apply to widgets in the '**Statics**' category.

All widget editing menus except those in the 'Statics' category have **at least** the following configurable parameters:

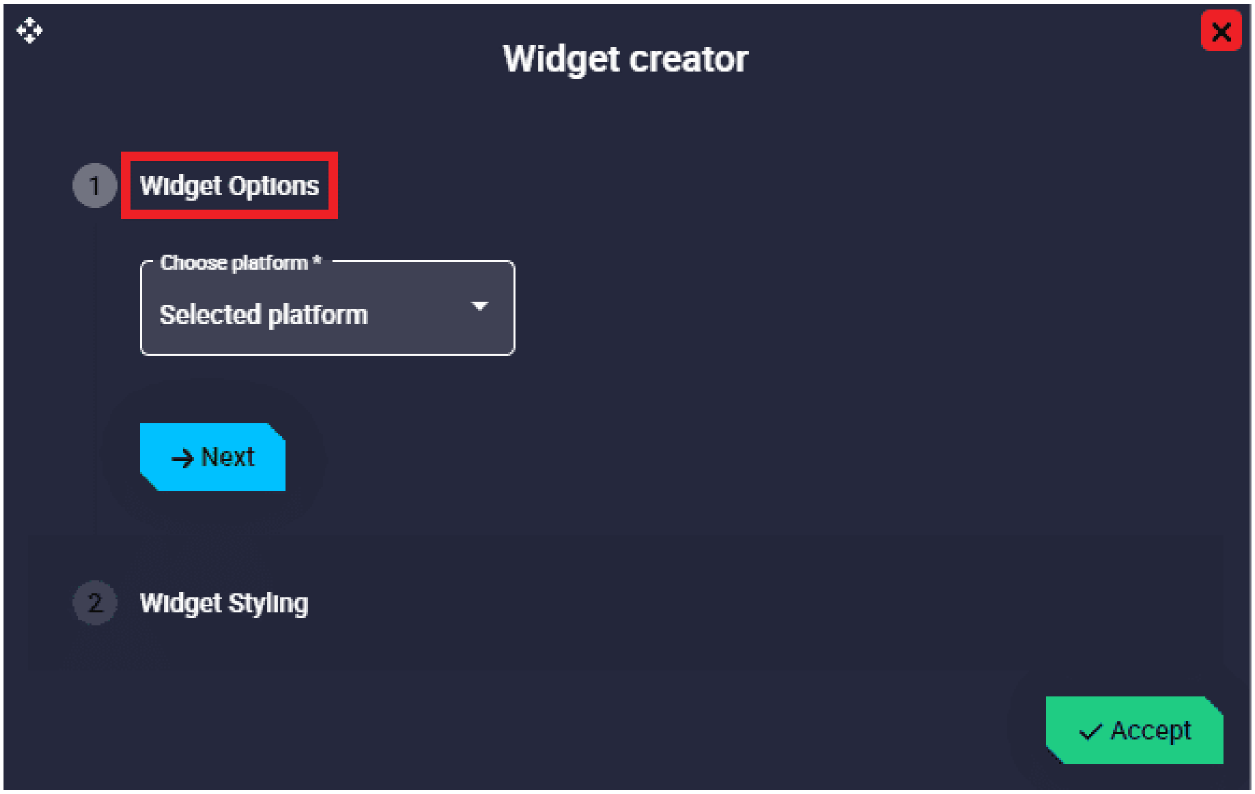


Fig. 220: **Edit menu - Widget Options**

- **Choose platform**: Users must select the platform for which the widget is configured. The available options will always be the IDs of the connected autopilots 1x and '**Selected platform**', i.e. the platform that is selected.

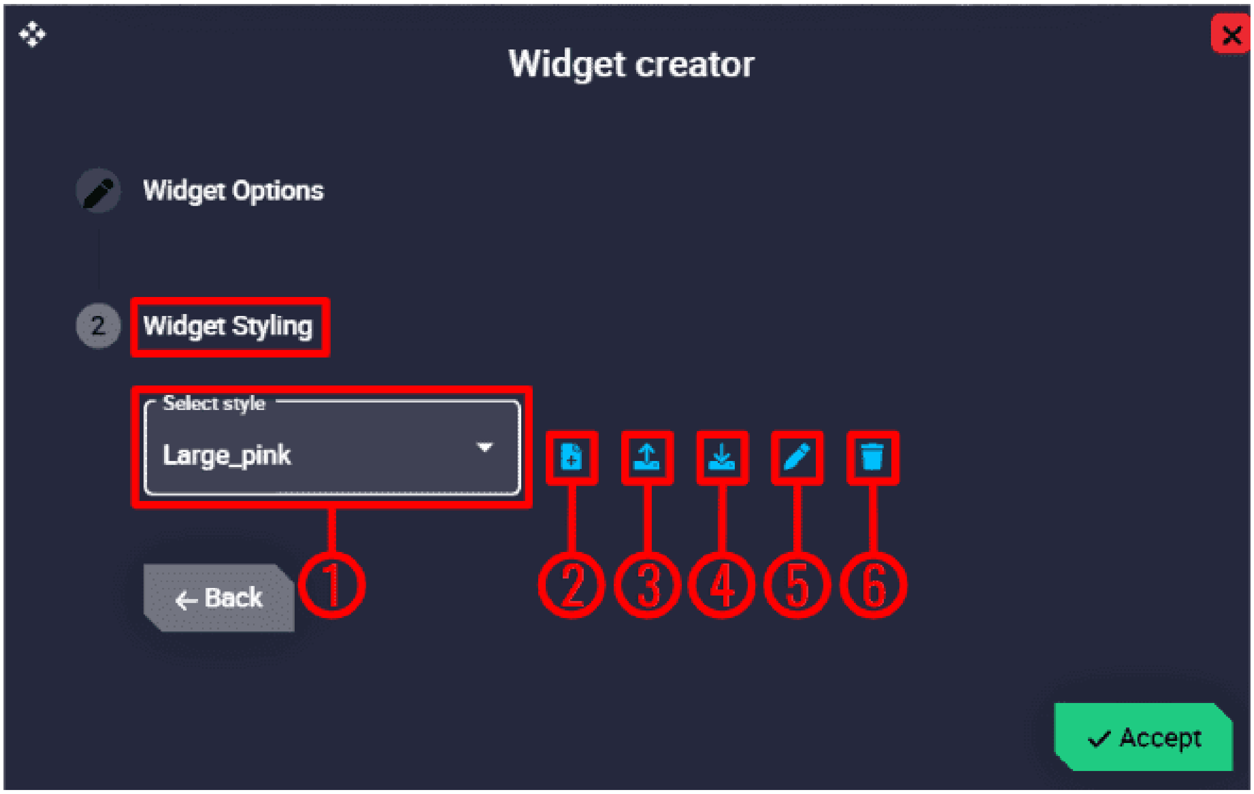


Fig. 221: **Edit menu - Widget Stylying**

Here the user can choose the style of the widget:

1. **Select style**: Default and custom styles can be selected. The available default styles are *Default_box*, *Default_box_transparent*, *Default_box_blur*, *Default_box_black*, *Default_pill* and *Default_pill_blur*.

   Note: Not all these default styles are available in all widgets.

2. **Add new style**: A new style can be created here.
3. **Import style**: Users can import a custom style from local storage. It must be a `.css` file.
4. **Export style**: By clicking here, the **selected custom style** will be exported in a zip folder. More information about the contents of this folder is described in *Status bar - Style manager section* of this manual.

   Important: This option is only **available** when a **custom style is selected**.

5. **Edit style**: Users can directly edit the configuration (code) of the selected style by clicking here.

   Important: This option is only **available** when a **custom style is selected**.

6. **Remove style**: The selected style will be deleted.

   Important: This option is only **available** when a **custom style is selected**.

All widgets are explained in detail in the following sections:

- *Main*
- *Displays*
- *Charts*
- *Statics*
- *Flight instruments*

3.5.2.2.1 Main

Veronte Panel

This pannel is the **basic operator tool**. It includes all basic commands (phase and action buttons) and information needed during a standard mission. These commands can be triggered with a single click, by sliding and/or automatically.

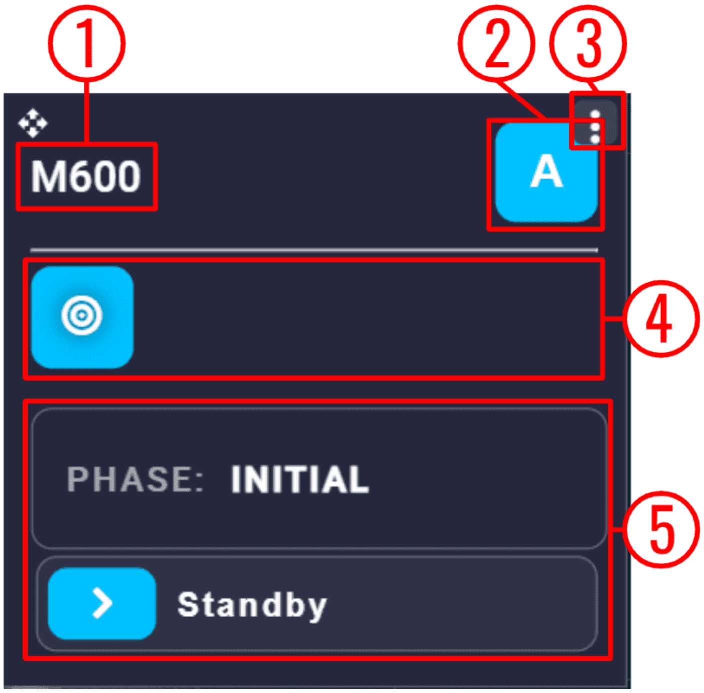


Fig. 222: **Veronte Panel**

1. **Platform name**: The name of the selected platform is shown here.
2. **Flight mode**: Displays the currently selected flight mode in which the user is operating.

   By clicking on it, it is possible to **manually** change the selected mode. The flight modes available here must be previously defined in the Modes section of the **1x PDI Builder** software.

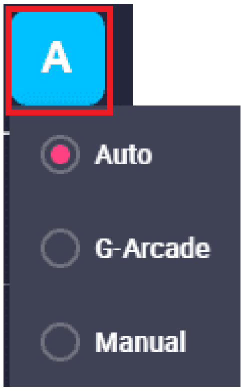


Fig. 223: **Veronte Panel - Flight modes**

Note: When in manual mode, the lettering of the icon will be **red**, to warn the operator to be careful in this mode.

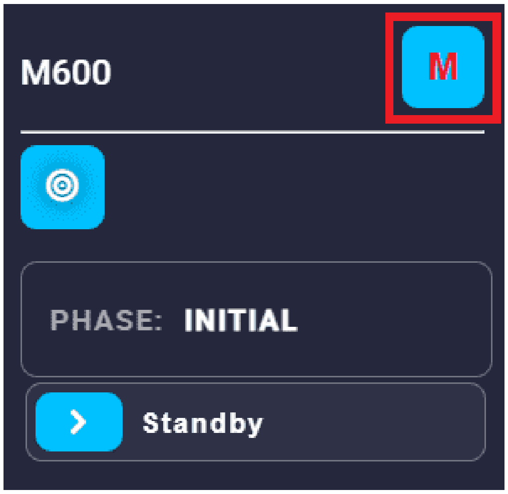


Fig. 224: **Veronte Panel - Manual flight mode**

Besides, the mode can also be changed automatically with an automation or manually with a configured stick. The following example shows the mode change with a stick:

Fig. 225: **Veronte Panel - Changing flight modes with a stick**

3. **Options**:

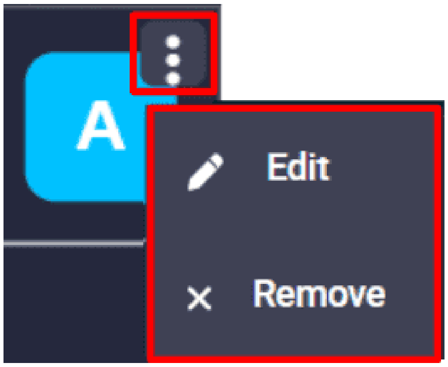
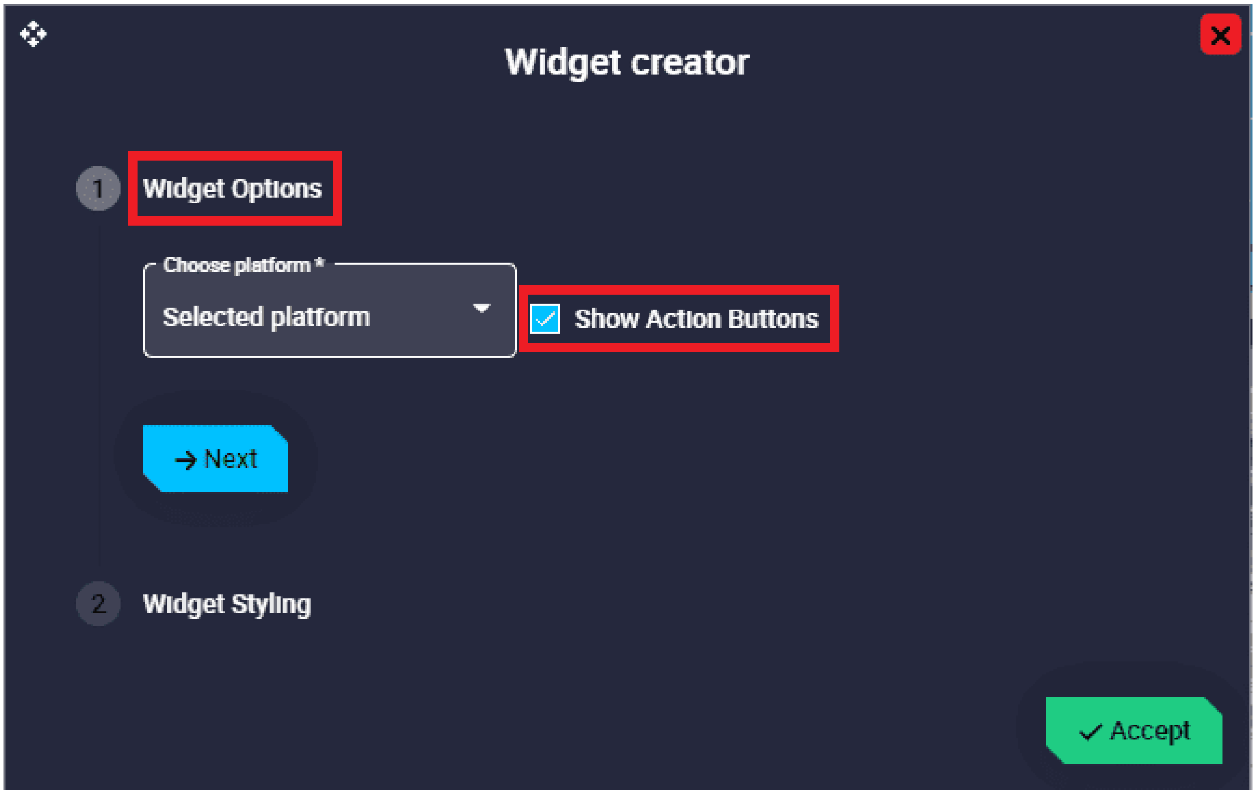


Fig. 226: **Veronte Panel options**

- **Remove**: Deletes this widget.
- **Edit**: This allows the user to access the Veronte panel configuration menu.

  This widget has only **one extra edit parameter** compared to the ones described in *Widget common configuration*:



☑ Show Action Buttons

Fig. 227: **Veronte Panel configuration**

  - **Widget Options** → **Show Action Buttons**: When enabled, the action buttons are displayed in the Veronte panel.

4. **Action buttons**: Action buttons can be used to manually trigger certain actions. These buttons must have been previously defined in the Automations menu of the **1x PDI Builder** software.

   These buttons change to green when clicked.

Fig. 228: **Veronte Panel - Changing phase**

5. **Phase buttons**: The currently selected phase is always displayed at the top in the *current phase identifier*.

Important: Not all existing flight phases are initially displayed. Only flight phases that can be entered from the currently selected phase are displayed.

To change phase, simply slide the > icon to the right. Then, if everything is correct, the phase will be displayed in the *current phase indentifier* and will be colored green while switching to that phase. An example is shown below:

Fig. 229: **Veronte Panel - Changing phase**

> **Warning:** An **error** may occur when changing phase, so that the phase change does not take place.
>
> To solve this problem, please check the *Error when changing phase - Troubleshooting section* of this manual.

Checklist

This panel is used to make sure that some requirements have been accomplished, for example, prior to a phase change or to avoid a possible malfunction.

It must be previously defined in the Checklist section of the **1x PDI Builder** software.

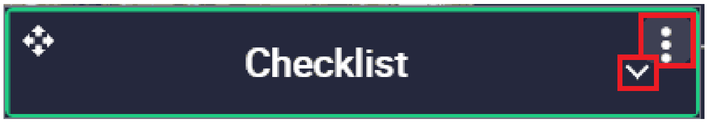


Fig. 230: **Checklist**

- **Options**:

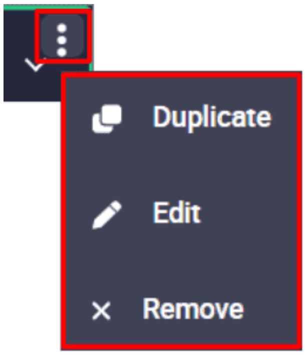


Fig. 231: **Checklist options**

- **Duplicate**: Duplicates this widget.
- **Edit**: This allows the user to access the Checklist configuration menu. This widget has only the 'basic' configuration described in the *Widget common configuration*.
- **Remove**: Deletes this widget.

As this widget behaves like a drop-down menu, clicking on the ⌄ icon will display all checklists:

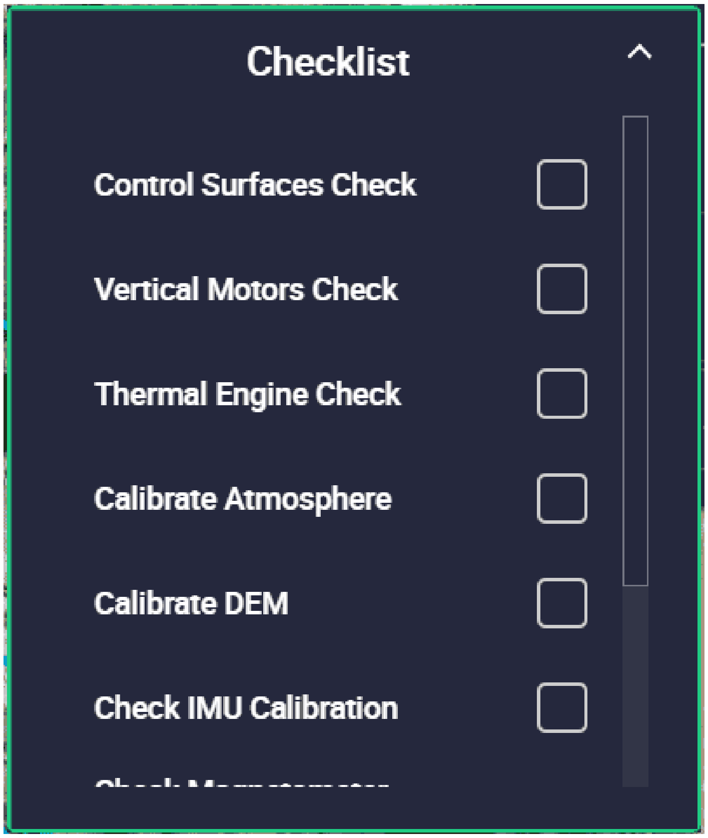


Fig. 232: **Checklist deployed**

Besides, as can be seen in the figures above, the **checklist widget has a small green border**. This indicates that **everything is OK to start the operation**, even though there is no 'check' in the list.

This is because **none of these checks are mandatory** to switch phases or start the operation. **The mandatory checks are marked with an asterisk (*)** on the right, as shown in the image below.

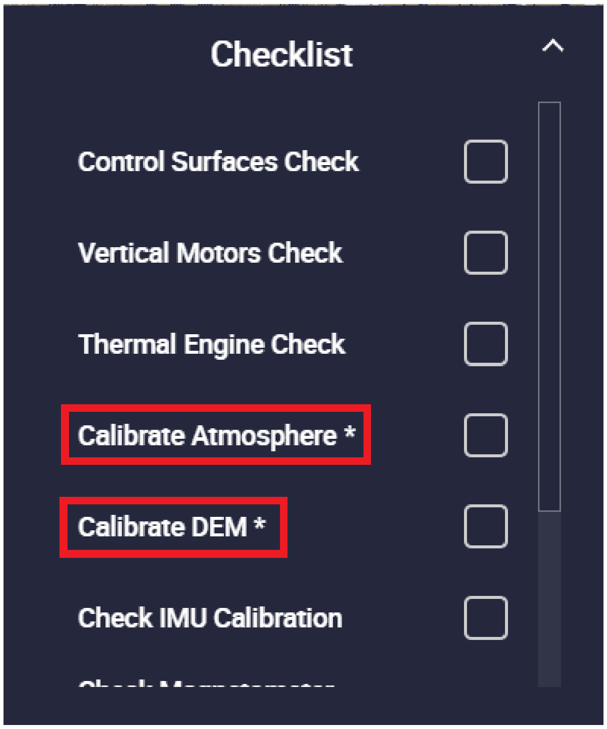


Fig. 233: **Checklist deployed - Not checked**

In this case, the widget has **no green border until these mandatory actions are performed**:

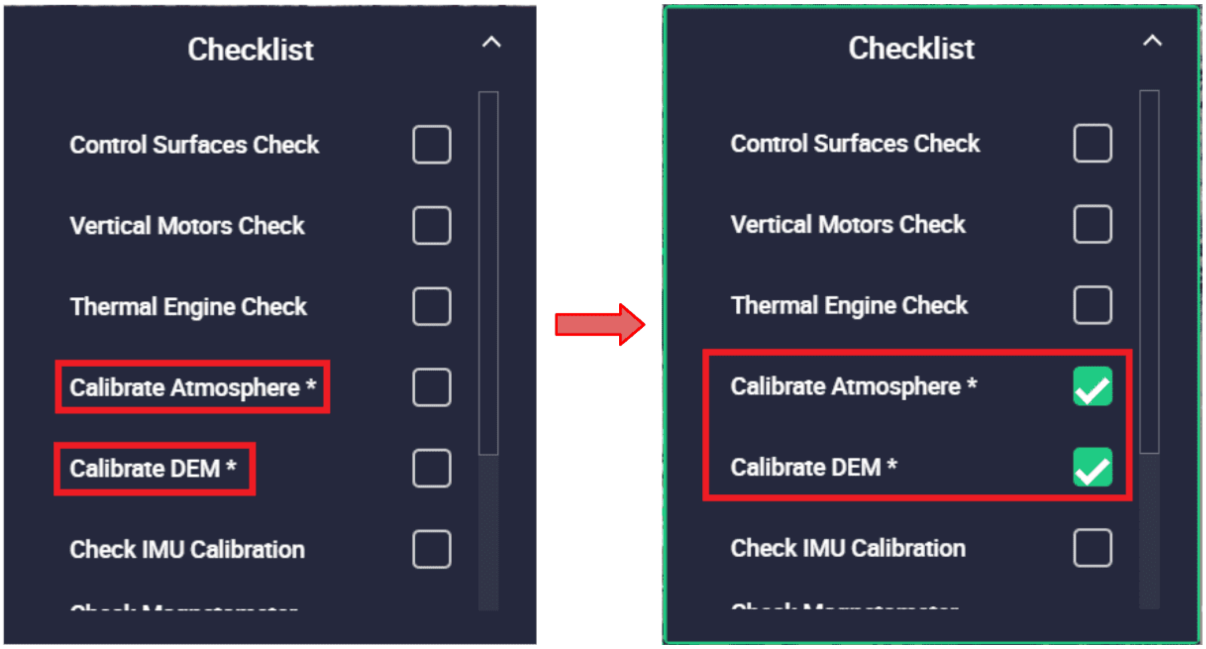


Fig. 234: **Checklist deployed - Checked**

To do so, checking them opens a menu that allows the user to perform these actions, in this case, some calibrations. An example is shown below:

Fig. 235: **Checklist - Actions**

Map

This widget corresponds to the map and **only appears** in this menu when the map has been **hidden** by the user.

3.5.2.2.2 Displays

Label

Depending on the type of variable selected, the appearance of the label (by default) is different.

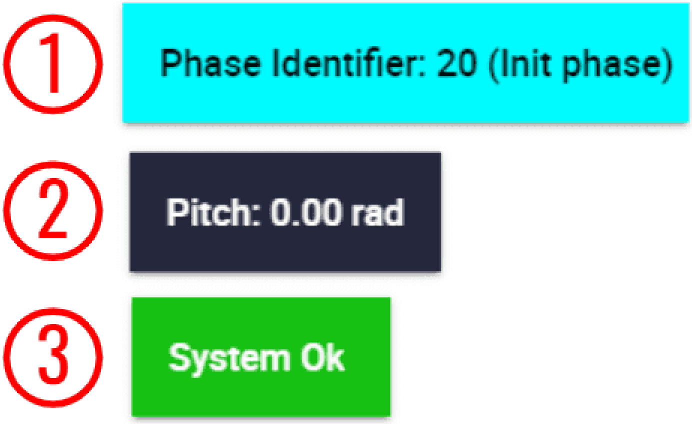
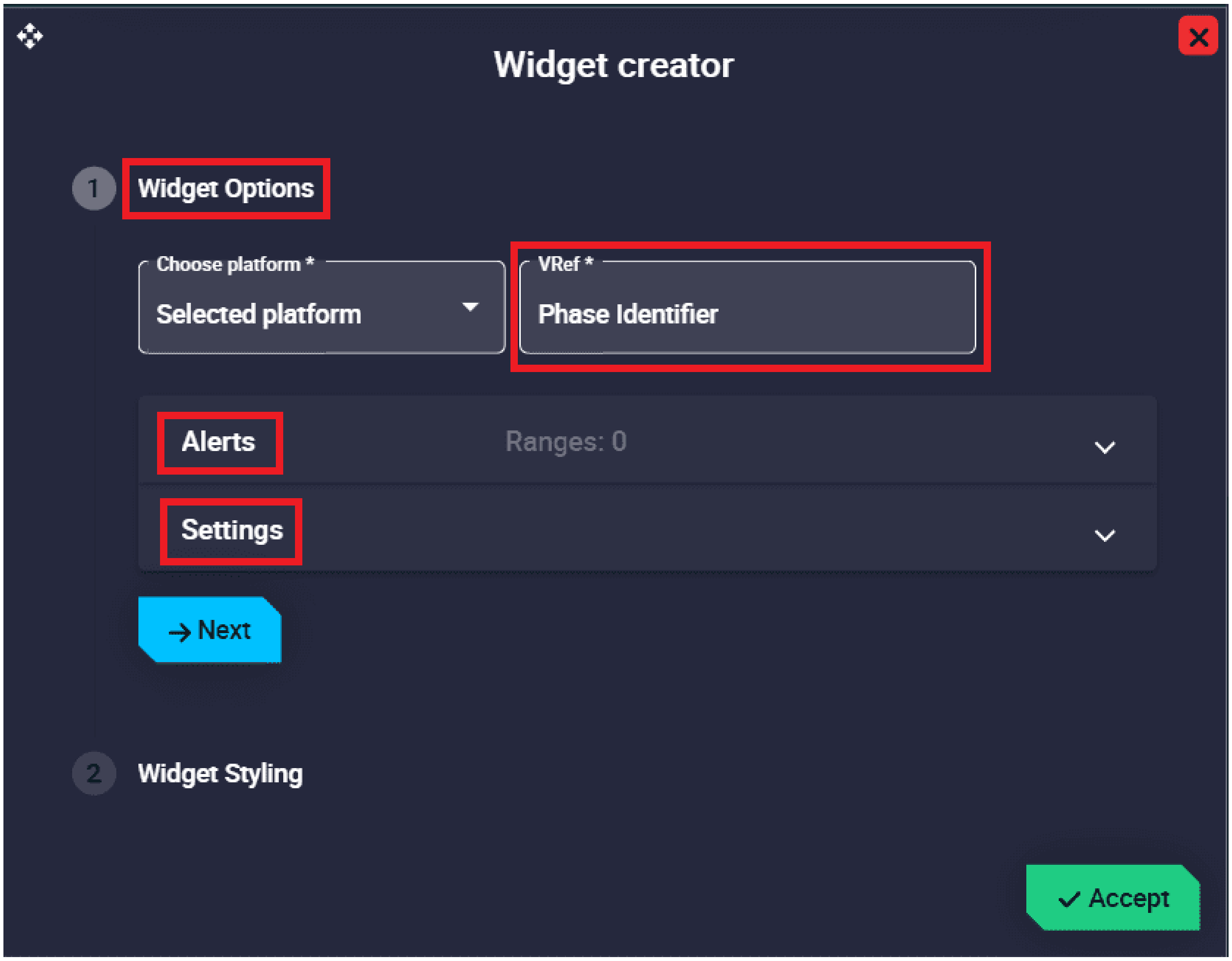


Fig. 236: **Label**

1. **Integer variables**: Only the variable with its value is displayed.
2. **Real variables**: The units of the variable are displayed.
3. **Bit variables**: These labels have failure/success color.

Right click on the **labels** to access their options (**Duplicate**, **Edit** and **Remove**):

- **Options** → **Edit**: This allows the user to access the Label configuration menu.



Choose platform *: Selected platform

VRef *: Phase Identifier

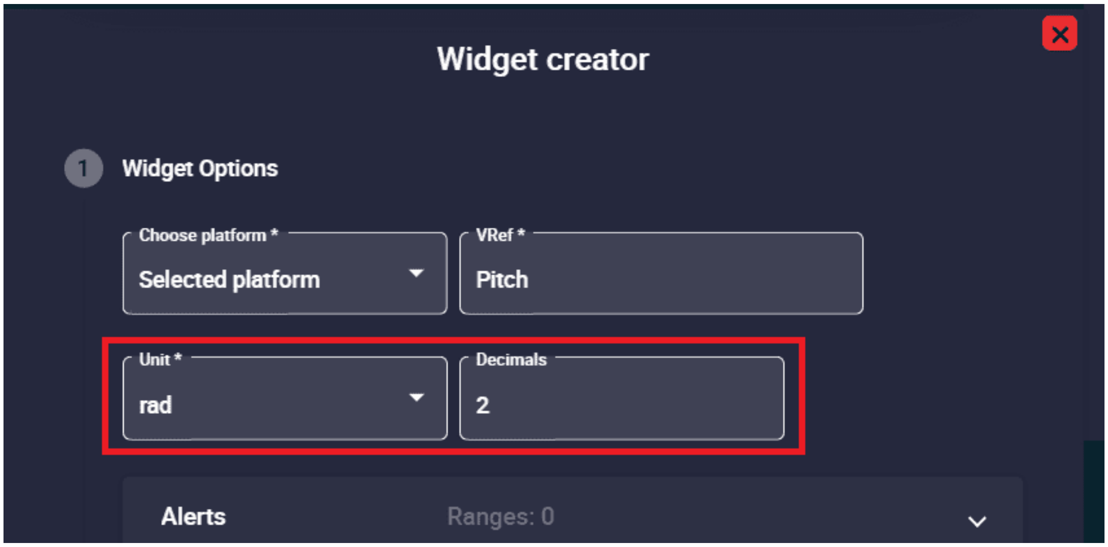
Ranges: 0

Fig. 237: **Label configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **VRef**: Users can choose any real, integer or bit variable to be displayed on the label.
  - **Unit and Decimals**: Attention!! **These are only available with Real variables**.



Widget creator

1 Widget Options

Choose platform *: Selected platform

VRef *: Pitch

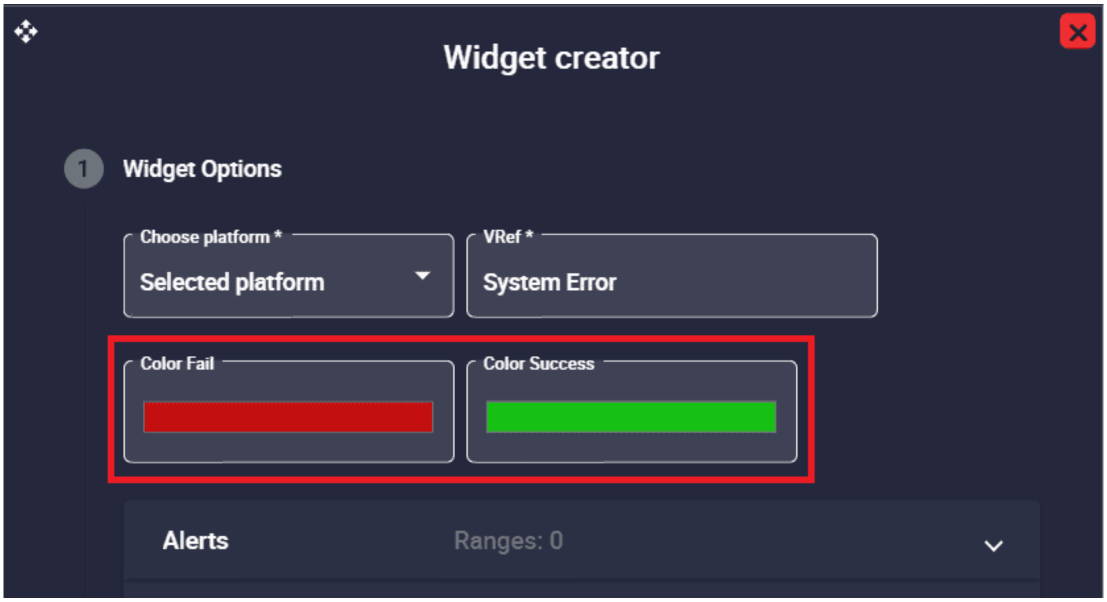
Unit *: rad

Decimals: 2

Fig. 238: **Real label configuration**

- **Color fail/success**: By default, when the bit variable is in 'fail mode', the label is red and when it is in 'success mode', it is green.

  Attention!! **This is only available with Bit variables**.



Widget creator

1 Widget Options

Choose platform *: Selected platform

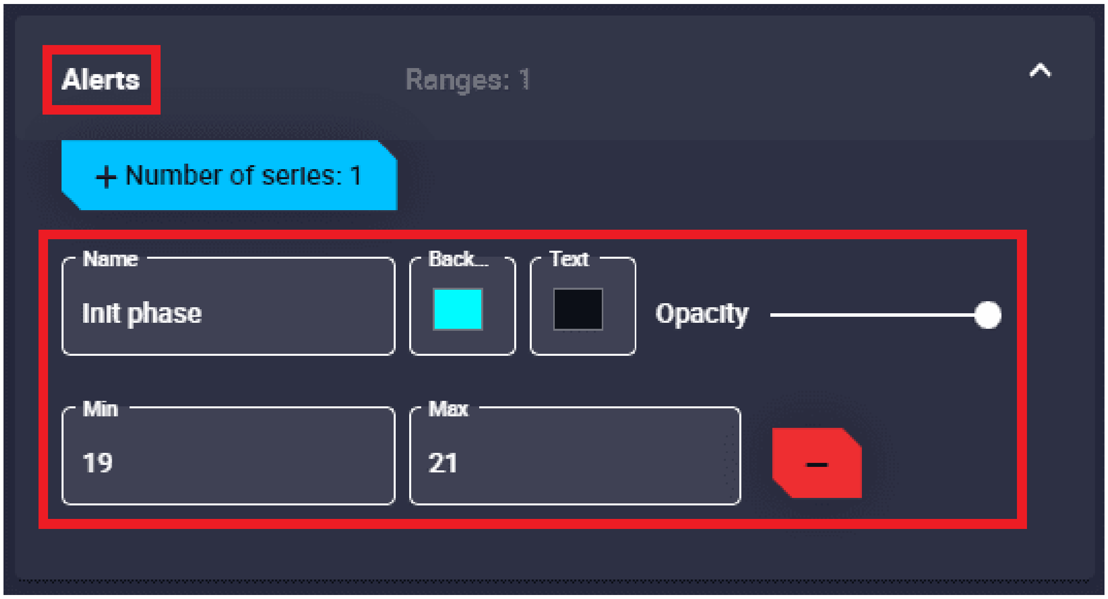
VRef *: System Error

Color Fail: 🟥

Color Success: 🟩

Fig. 239: **Bit label configuration**

- **Alerts**: Allows the user to set different ranges. For this range several customizations can be made:



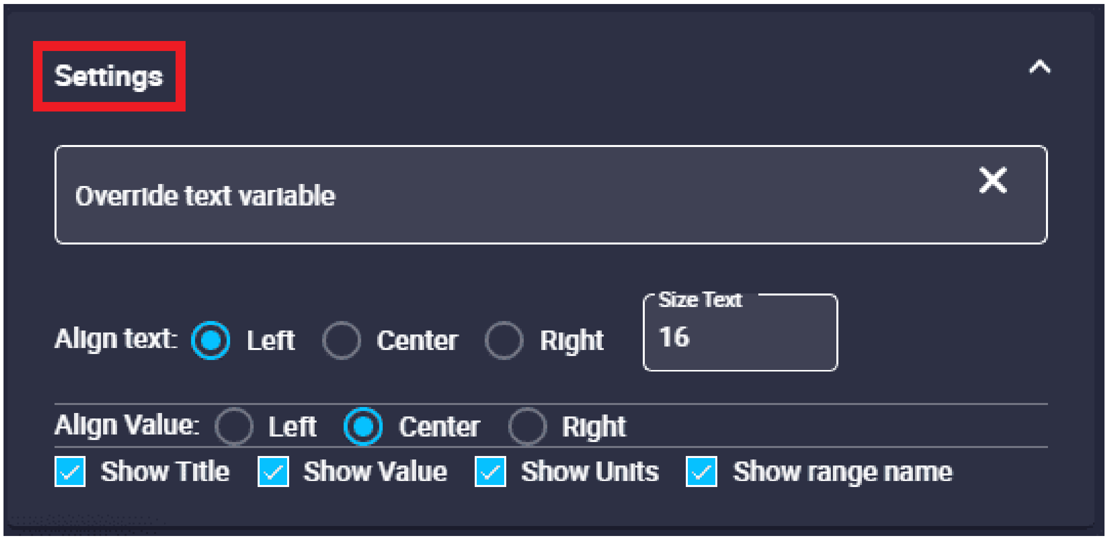
Name: Init phase

Min: 19

Max: 21

Fig. 240: **Label configuration - Alerts**

    - **Name**: An indentifier name of the range can be set.
    - **Background color**: Changes the color of the label when the variable is in this range.
    - **Text color**: Changes the color of the label text when the variable is in this range.
    - **Opacity**: The opacity of the label can be customized in this interval.
    - **Start/End**: Defines the start and end values of the range.
    - **Remove**: Click to delete this interval.
  - **Setttings**: The ‘shape’ of the displayed text can be edited:



Align text: ● Left ○ Center ○ Right

Size Text: 16

Align Value: ○ Left ● Center ○ Right

☑ Show Title ☑ Show Value ☑ Show Units ☑ Show range name

Fig. 241: **Label configuration - Settings**

    - **Override text variable**: The label name can be changed by typing a new one different from the variable name.

Warning: This does not rename the selected variable in the configuration, it is only the name shown in the label.

- **Align text**: The text of the variable can be left, center or right aligned.
- **Size text**.
- **Align Value**: The value of the variable can be left, center or right aligned.
- **Show Title/Value/Units**: The title, value and units of the variable can be shown/hidden.
- **Show range name**: If enabled, the name assigned to the range will appear next to the variable.

Alerts

These alerts are **bits** variables that **only appear when in 'failure mode'**.

By default, they are displayed with an exclamation icon, in flashing red and with an alert sound. However, they can be customized accessing their edit menu.

No alerts

Fig. 242: **Alerts**

By hovering the mouse cursor over the widget, the following actions appear:

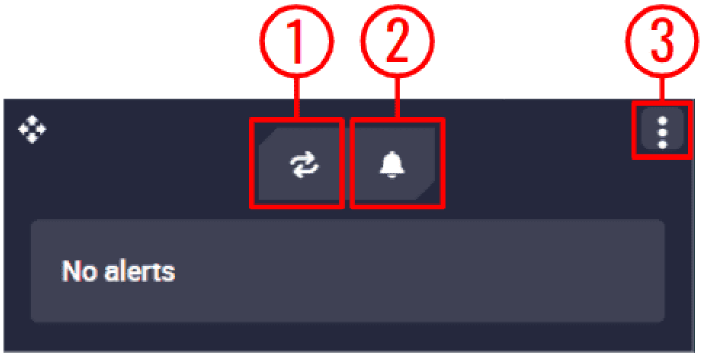


Fig. 243: **Alerts**

1. **Enable/Disable Loop**: Users can enable/disable the sound of the alerts to be in loop, i.e. sounding continously.
2. **Mute/Unmute all alerts**: The sound of the alerts can be mute/unmute.
3. **Options**:

- **Duplicate**: Duplicates this widget.
- **Edit**: This allows the user to access the Alerts configuration menu.

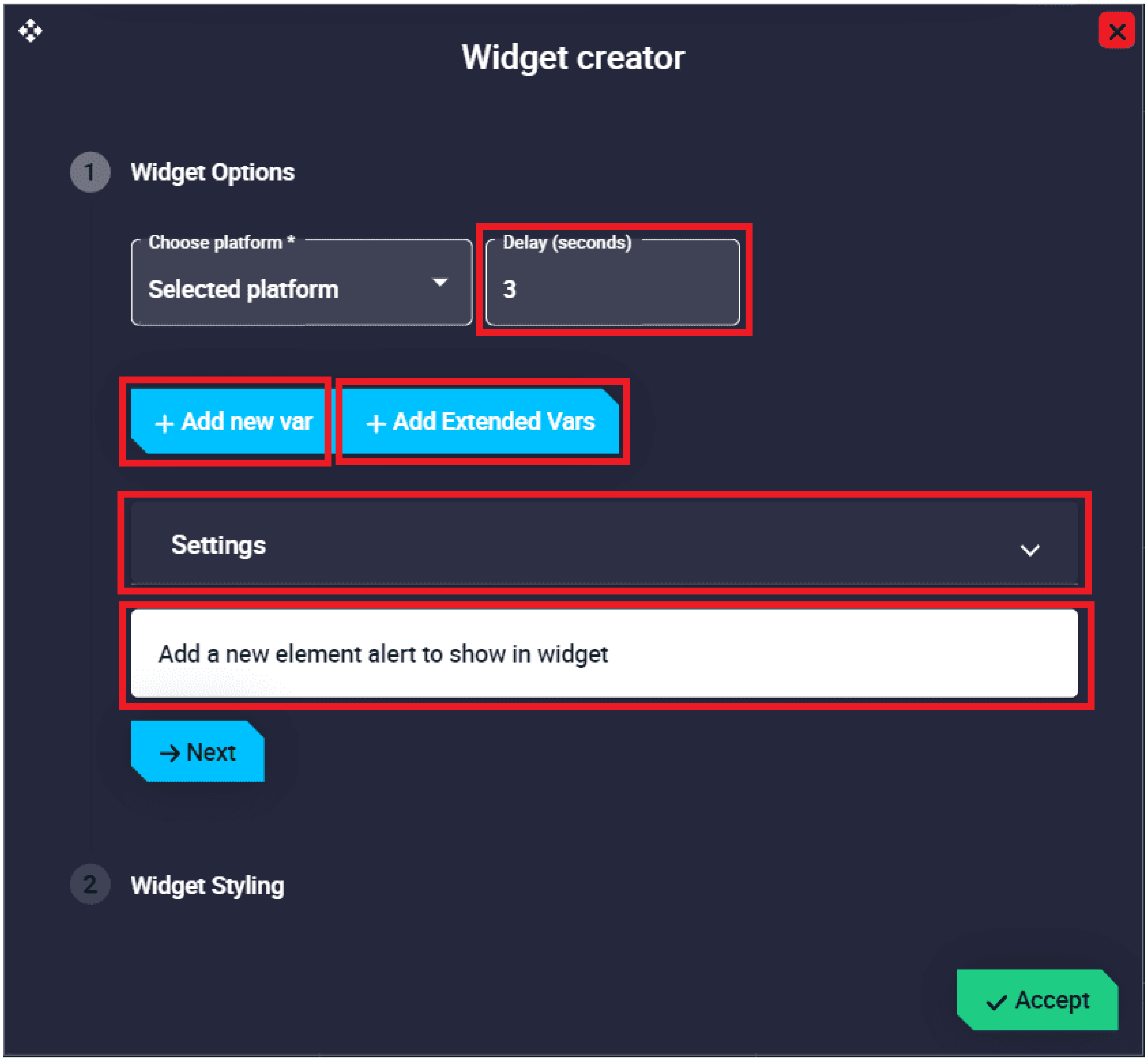


Fig. 244: **Alerts configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **Delay**: This is the time (in seconds) between the sounding of alerts **when the loop option is enabled**.
  - **Add new var**: Press this button to add a new alert variable. They are configured below.
  - **Add Extended Vars**: All bit variables of the autopilot status message will be added as alerts.

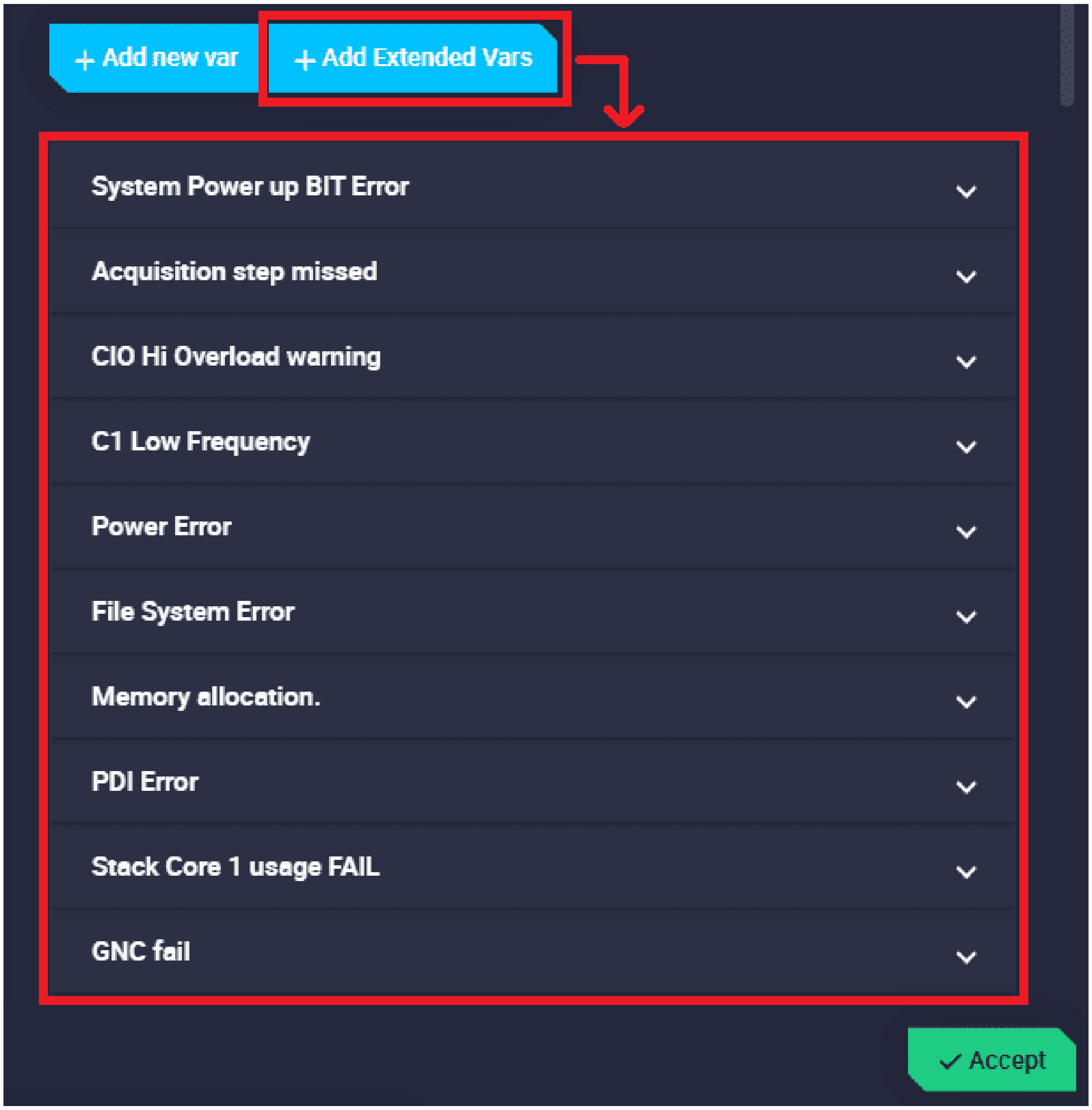


Fig. 245: **Alerts configuration - Extended Vars**

- **Add a new element alert to show in widget**: When adding a variable (by clicking on the **'Add new var' button** or the **'Add Extended Vars' button**), the following configurable field is added to the configuration menu:

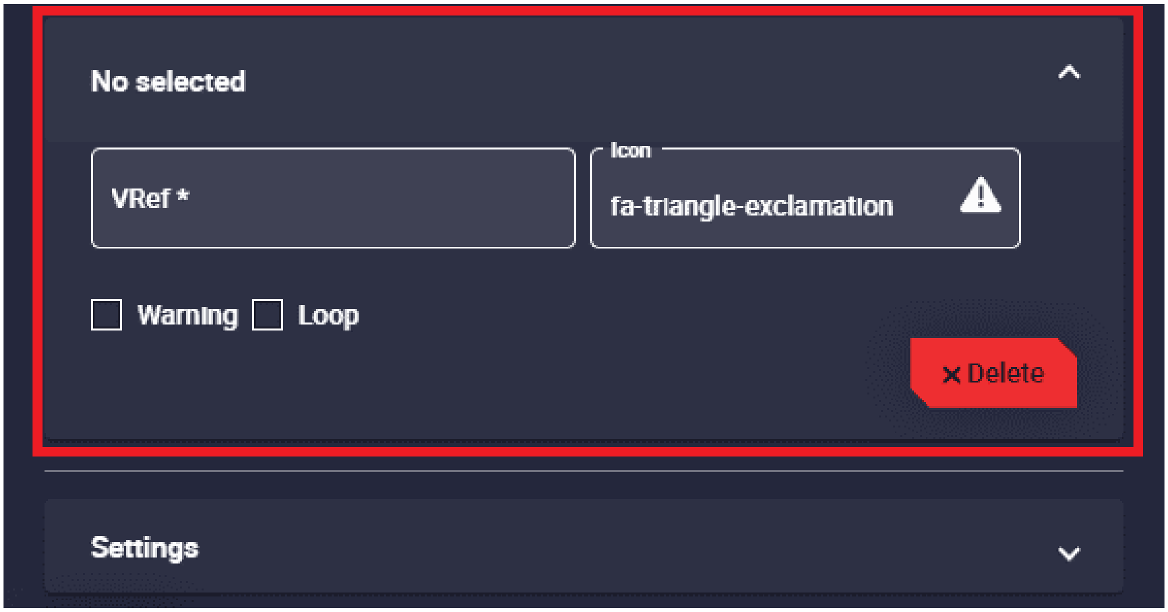


Fig. 246: **Alerts configuration - Variables**

- **VRef**: Users can select the desired bit variable to be displayed as an alert.
- **Icon**: Choose the icon to be displayed next to the variable. By default, it is an exclamation icon, as can be seen in the figure above.
- **Warning**: If enabled, the selected alert will be displayed in orange instead of red.
- **Loop**: If **enabled**, the sound of the selected alert will be **looped with the delay time specified** above. **Otherwise**, the **alert sound will only play when the alert is triggered**.

  For example, if the delay is set to 3 seconds, the loop option is enabled and the selected variable is in fail mode, the alert sound will sound every 3 seconds.
- **Delete**.

∗ **Settings**: Here the user can modify the settings common to all alerts:

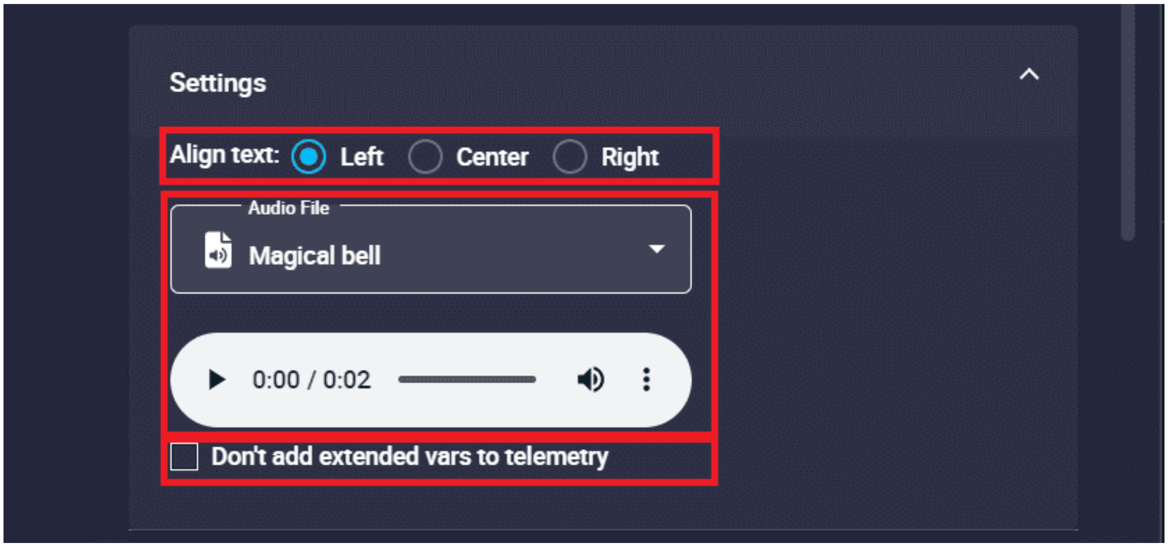
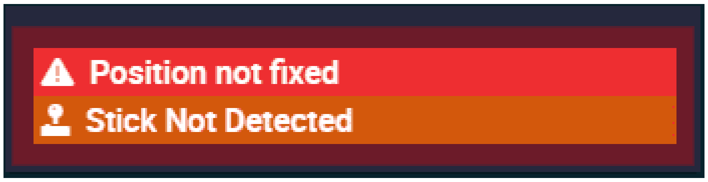

Settings
Align text: ● Left ○ Center ○ Right
Audio File
Magical bell
0:00 / 0:02
☐ Don't add extended vars to telemetry

Fig. 247: **Alerts configuration - Settings**

- **Align text**: The variable text can be aligned left, centre or right.
- **Audio File**: Users can select the audio of the alert from the audio list. The volume and speed of the audio can be customized.
- **Don't add extended vars to telemetry**: If enabled, extended variables will not be added to the complementary telemetry. They will be read from the autopilot status message.

- **Remove**: Deletes this widget.

Some examples of alerts are shown below:



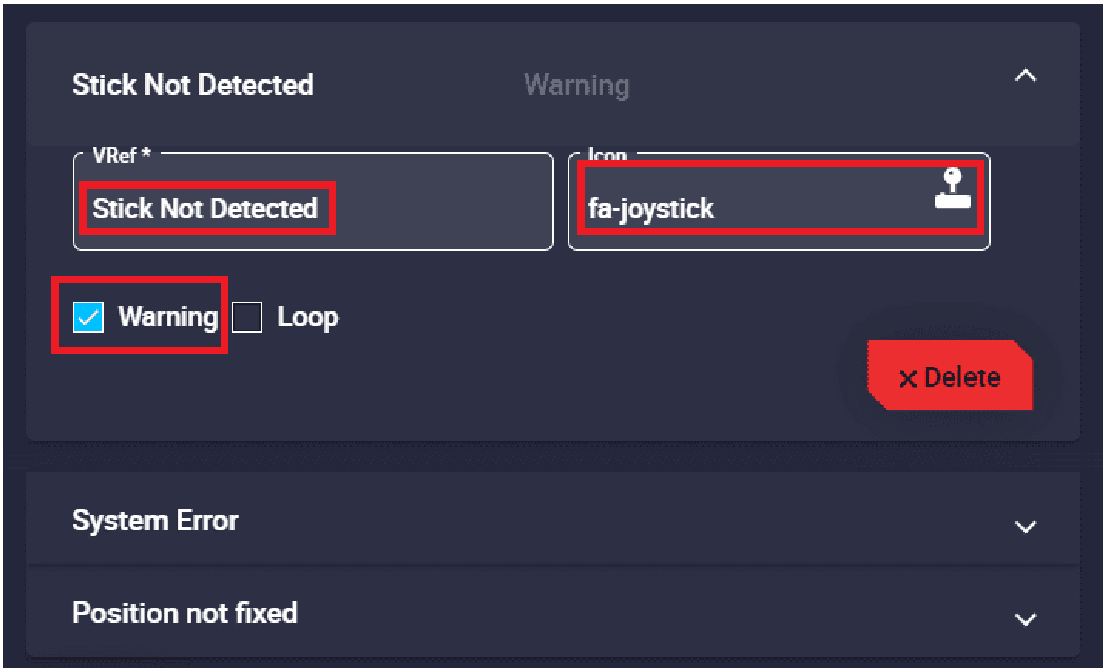
Position not fixed

Stick Not Detected

Fig. 248: **Alerts example**

The following figures show how these alerts have been configured:

- Stick not detected: This alert has been defined as a **warning** and its icon has been replace by another icon more related to the variable (a **joystick icon**).



Stick Not Detected Warning

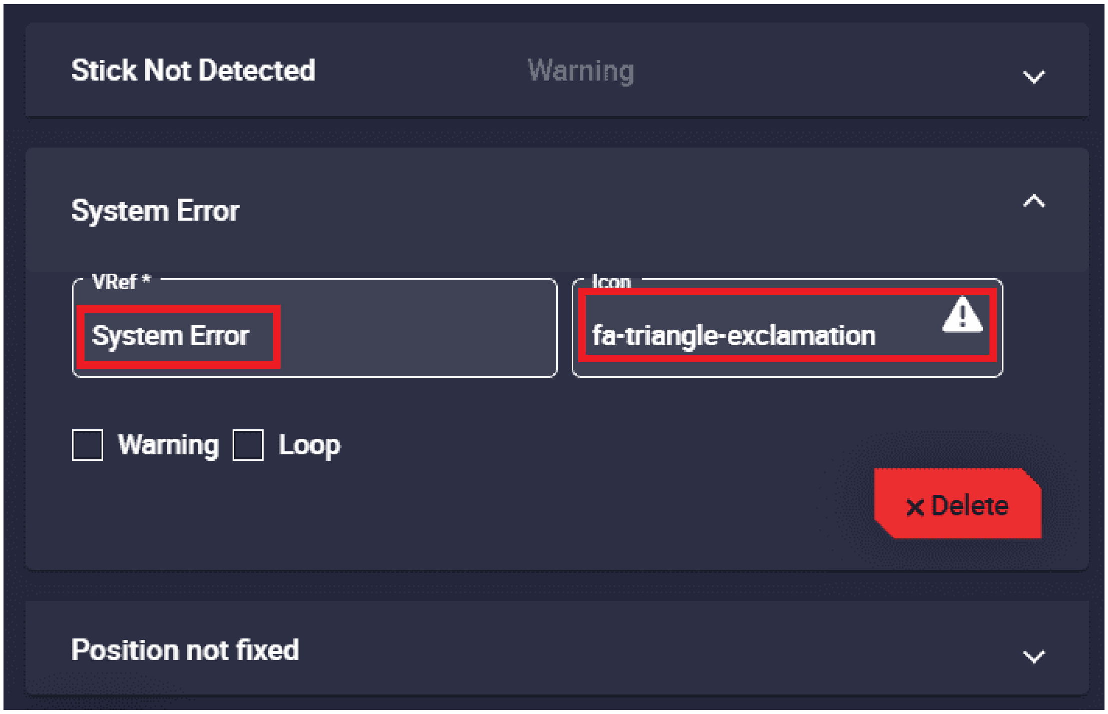
VRef *: Stick Not Detected

Icon: fa-joystick

☑ Warning ☐ Loop

Fig. 249: **Alerts configuration example**

- System Error: Although this variable has been configured as an alert, it does not appear as such. This is because it is not in 'failure mode'.



System Error

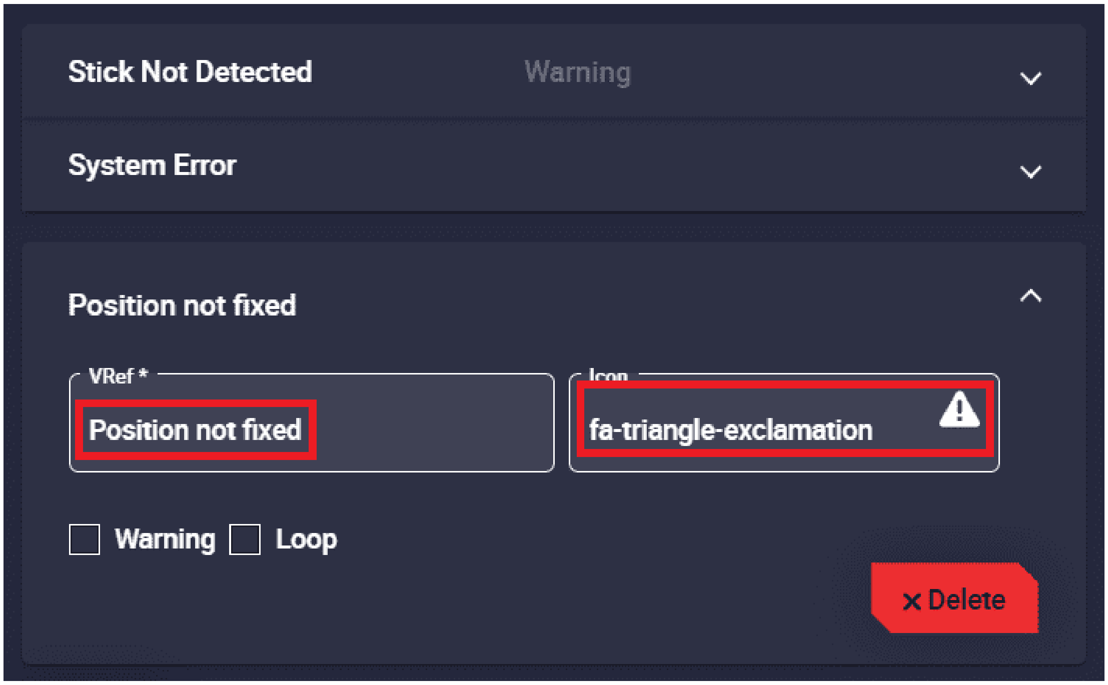
VRef *: System Error

Icon: fa-triangle-exclamation

☐ Warning ☐ Loop

Fig. 250: **Alerts configuration example**

- Position not fixed: This alert has not been customized, it appears with the default configuration.


Stick Not Detected Warning

System Error

Position not fixed

VRef *: Position not fixed

Icon: fa-triangle-exclamation

☐ Warning ☐ Loop

Fig. 251: **Alerts configuration example**

Timer

This widget is a counter, which can also function as a countdown counter if configured as such.

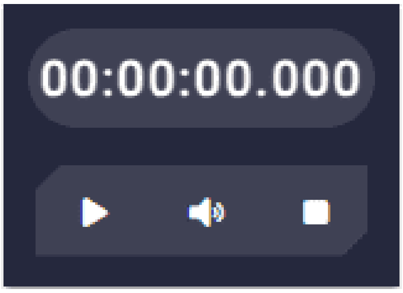


Fig. 252: **Timer**

Right click on the **widget** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Timer configuration menu.

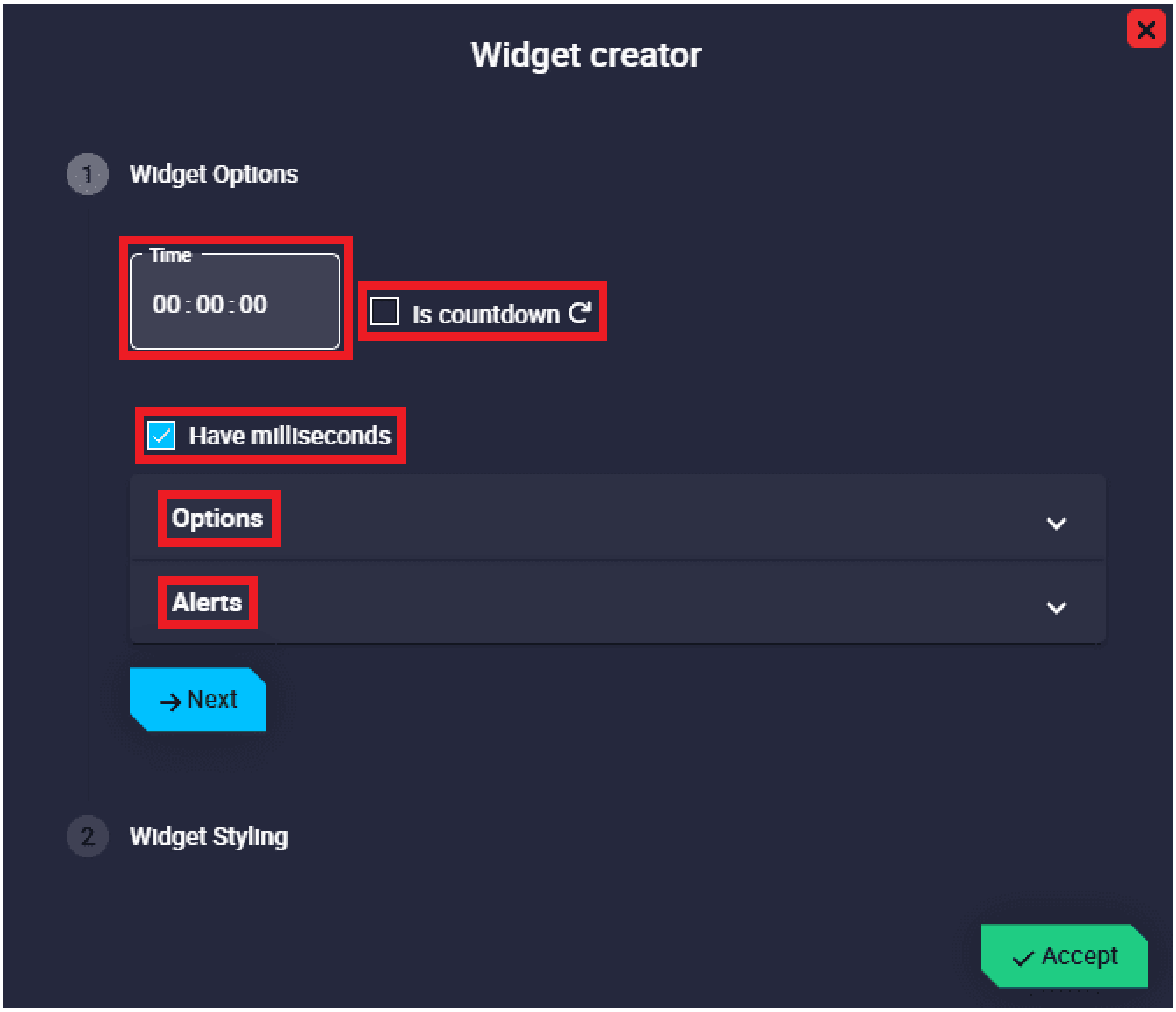
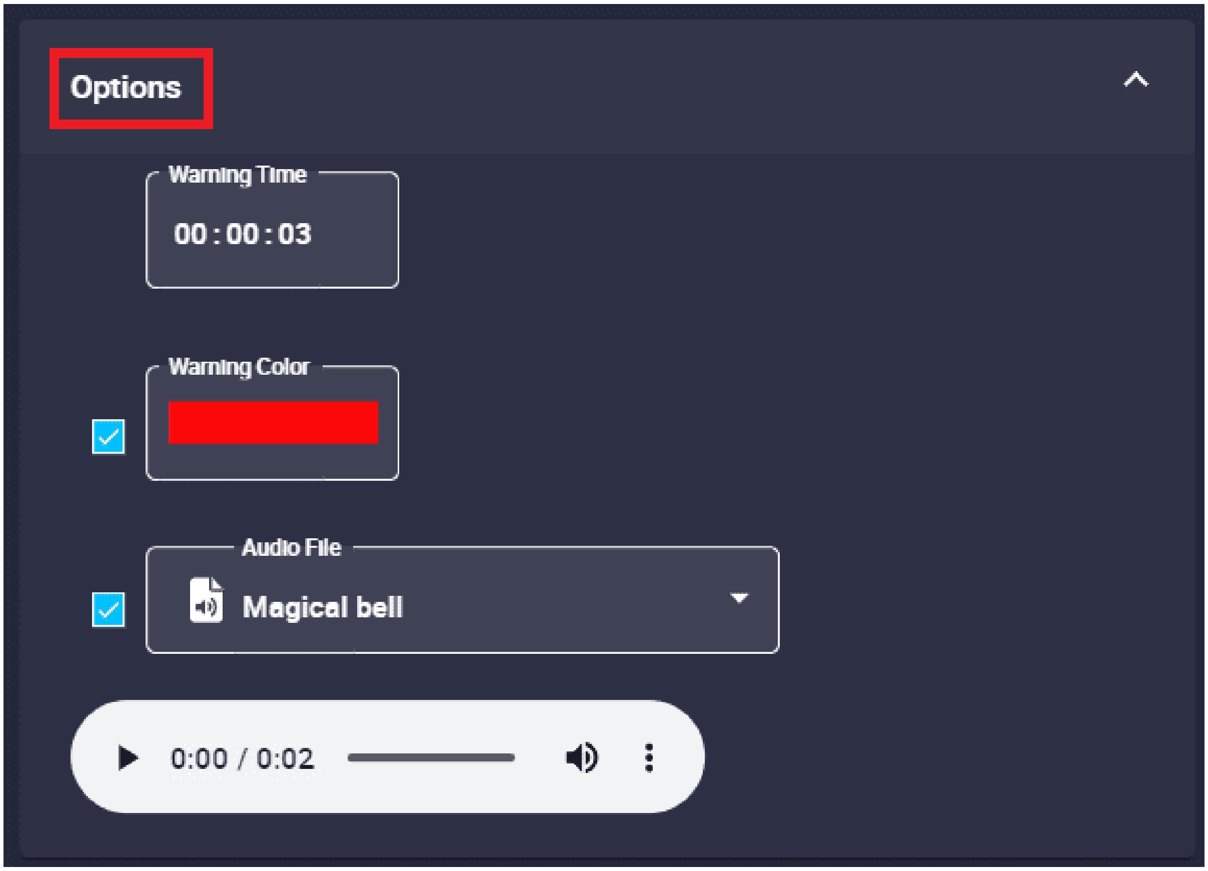


Fig. 253: **Timer configuration**

- **Widget Options**

  This widget has **different edit parameters** compared to the ones described in the *Widget common configuration*.

  - **Time**: Users must enter the desired counter time. Note that if the **Is countdown** checkbox is **enabled**, this becomes the **countdown time**.
  - **Is countdown**: Enabling this option turns the widget into a **countdown timer**. Default is disabled.
  - **Have milliseconds**: If enabled, the time will be displayed with milliseconds. By default it is enabled.
  - **Options**: Users can set a warning time, color and sound for when the timer reaches the end of the set counter/countdown time.



Warning Time: 00 : 00 : 03

☑ Warning Color

☑ Audio File: Magical bell

0:00 / 0:02

Fig. 254: **Timer configuration - Options**

- **Warning Time**: Time for the color and/or sound to be displayed until the end of the counter/countdown time.
- **Warning Color**: If enabled, this color shall be displayed flashing continuously from the time the warning time is reached until the end of the counter/countdown.
- **Audio File**: If enabled, the audio that users have selected from the audio list will play when the warning time is reached, sounding continuously until the end of the counter/countdown.

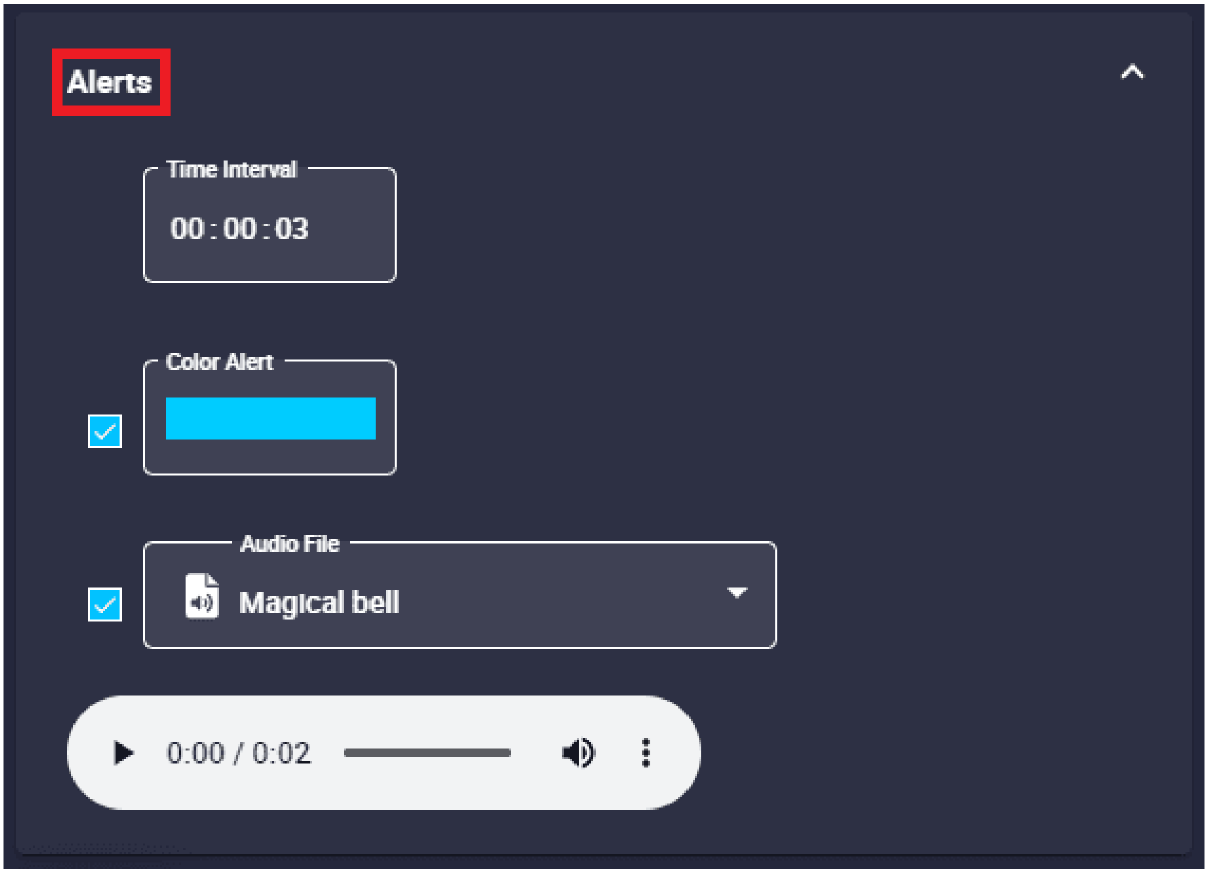
  For example, if the audio file has a duration of 2 seconds and the warning time is set to 3 seconds, the audio will start playing for the first time from 3 seconds left until 1 second left and then play for the second time from 1 second left until the end. In other words, the audio will sound 1.5 times.

Important: If **Warning Color** and **Audio File** parameters are disabled, the warnings will be disabled.

For example, if the timer is configured as a **countdown** with a time of 8 seconds and the warning time is set to 3 seconds, the widget will be displayed with the color and/or sound defined here each of those final 3 seconds, i.e. from 3 to 0 seconds:

Fig. 255: **Timer - Countdown example**

- **Alerts**: Light and/or sound alerts can be activated every certain specified time.



Alerts

Time Interval: 00 : 00 : 03

☑ Color Alert

☑ Audio File: Magical bell

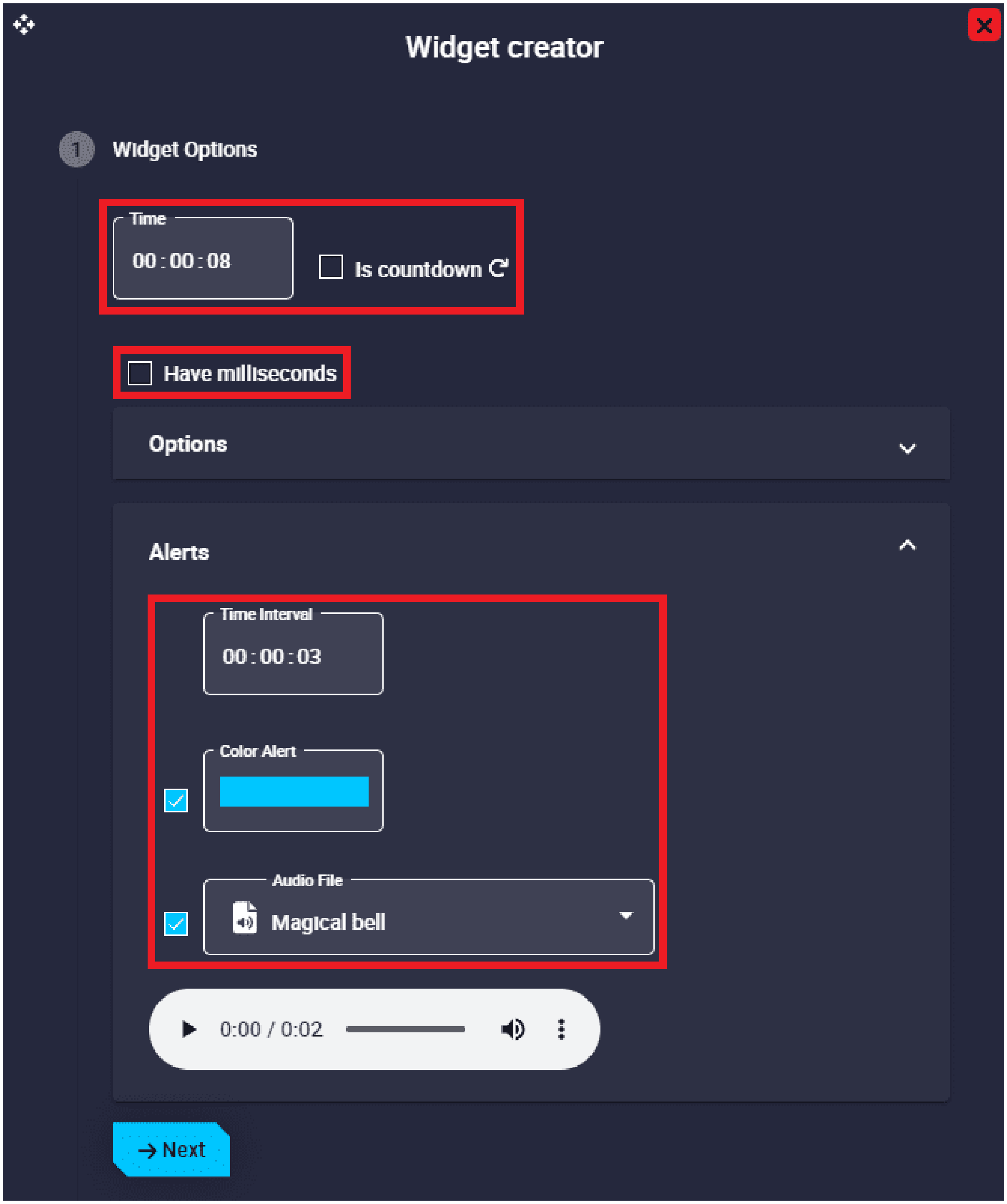
Fig. 256: **Timer configuration - Alerts**

- **Time Interval**: The time interval for the light and sound alerts is set here.
- **Color Alert**: If enabled, the timer will have a light alert with the color specified here when the time interval elapses.
- **Audio file**: If enabled, the timer will have an audible alert with the audio specified here when the time interval elapses.

  Users can select the audio of the alert from the audio list.

Important: If **Color Alert** and **Audio File** parameters are disabled, the alerts will be disabled.

An example is given below:



Time
00 : 00 : 08

☐ Is countdown

☐ Have milliseconds

Time Interval
00 : 00 : 03

☑ Color Alert

☑ Audio File
Magical bell

Fig. 257: **Timer - Alert example**

Fig. 258: **Timer - Alert example**

3.5.2.2.3 Charts

Chart

Charts widgets allow the user to represent any variable of the system with respect to time. Thus, the user can visualize the evolution of that variable over time.

It is very useful during flight tests (gain tuning) and operations to monitor the behaviour of the platform.

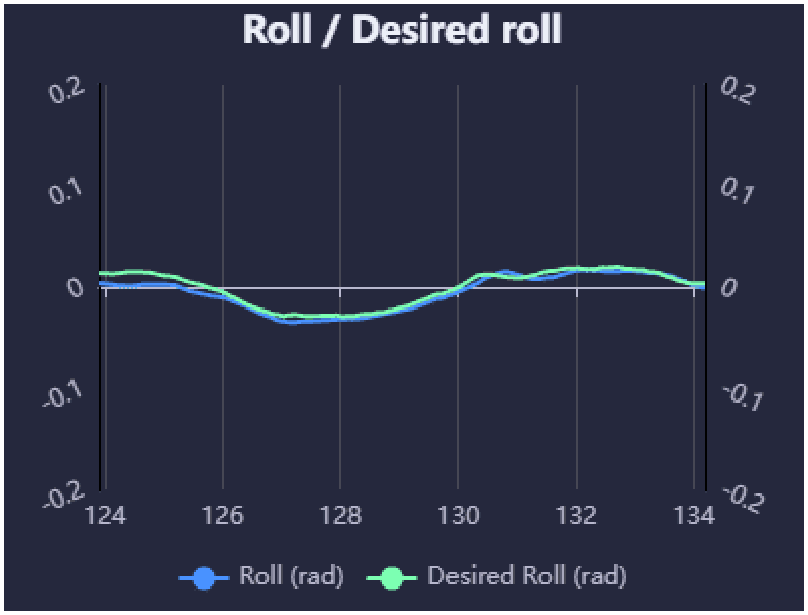


Fig. 259: **Chart**

Right click on the **chart** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Chart configuration menu.

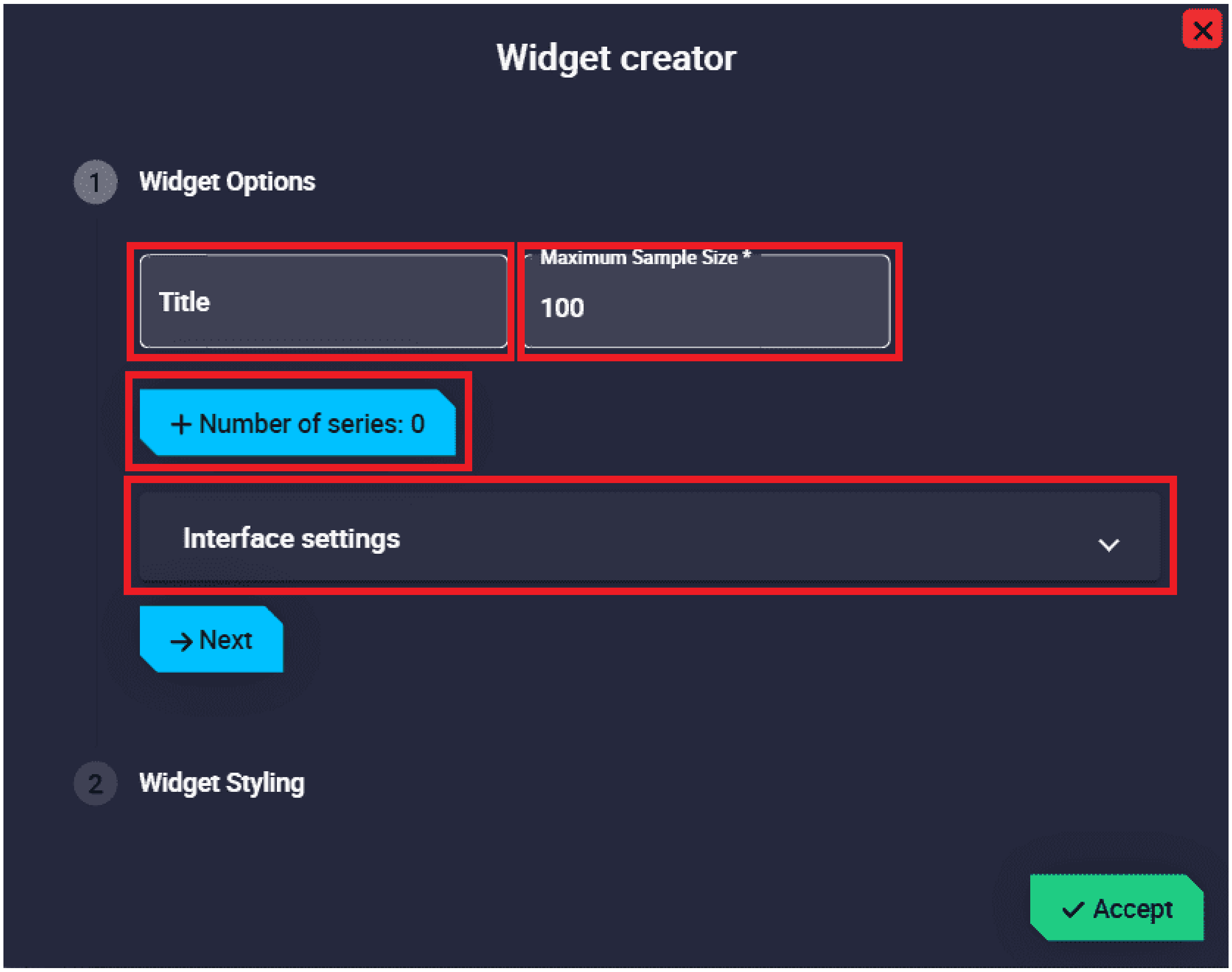


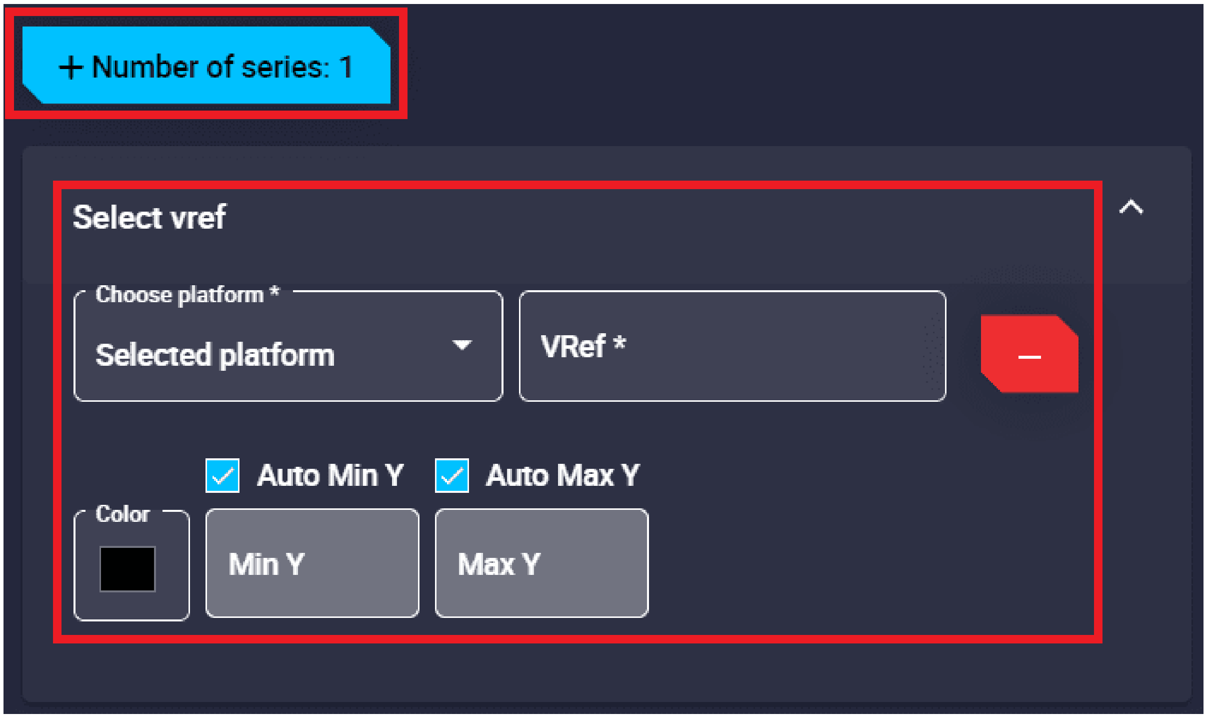
Fig. 260: **Chart configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **Title**: Title of the chart.
  - **Maximum Sample Size**: Maximum number of samples of the selected variable drawn in the chart. By default it is set to 100.
  - **Number of series**: Number of variables drawn in the chart. Users can add as many series as they wish to represent in the same chart.

    The appearance of this series in the chart can be configured below:



Choose platform *: Selected platform

VRef *

☑ Auto Min Y ☑ Auto Max Y

Color

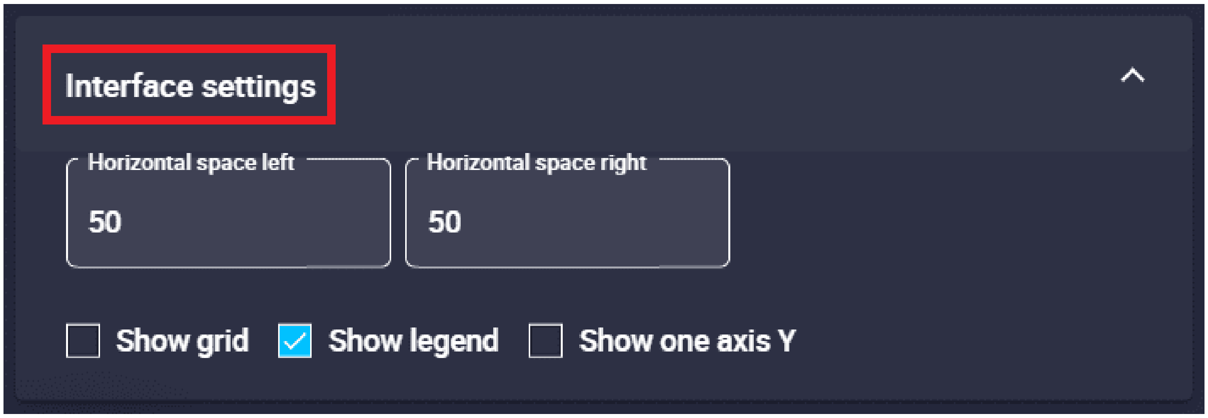
Min Y

Max Y

Fig. 261: **Chart configuration - Series**

- **VRef**: Users can choose any real, integer or bit variable to be displayed on the chart.
- **Unit Y and Decimals**: Attention!! **These are only available with Real variables**.
- **Color**: This is the color in which the line with the values of the series is drawn. By default, the first series is drawn in blue, the second in green, the third in yello, the fourth in red, etc.
- **Auto Min/Max Y**: If enabled, minimum and maximum of the *Y* axis of the chart are automatically adjusted.
- **Min/Max Y**: Minimum and maximum *Y* axis of the chart can be adjusted manually.

* **Interface settings**:



Horizontal space left: 50

Horizontal space right: 50

☐ Show grid ☑ Show legend ☐ Show one axis Y

Fig. 262: **Chart configuration - Interface settings**

- **Horizontal space left/right**: The horizontal space left/right of the chart background can be customized. By default they are set to 50.

- **Show grid**: The grid of the chart can be shown/hidden.
- **Show legend**: The legend of the series can be shown/hidden on the chart.
- **Show one axis Y**: When more than one series is added, it is possible to show only one *Y* axis by enabling this option.

The following is an example of a typical chart used during operation:

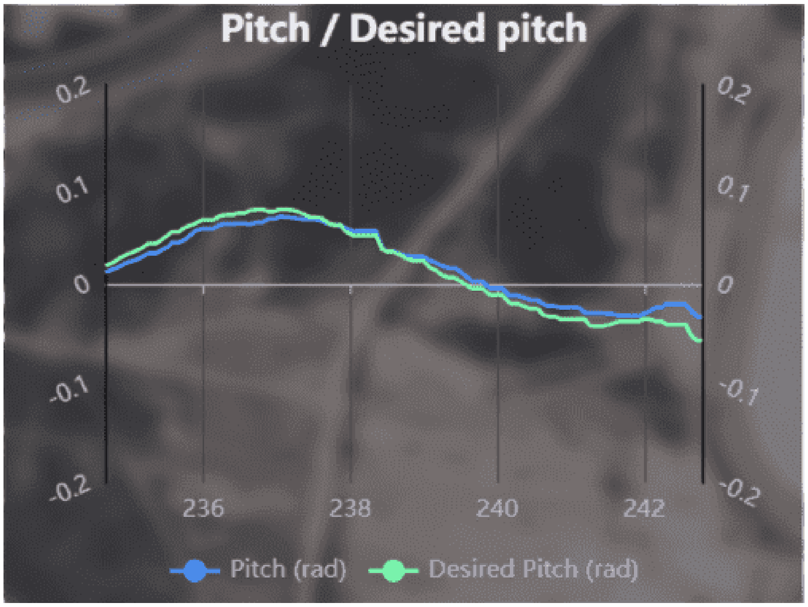
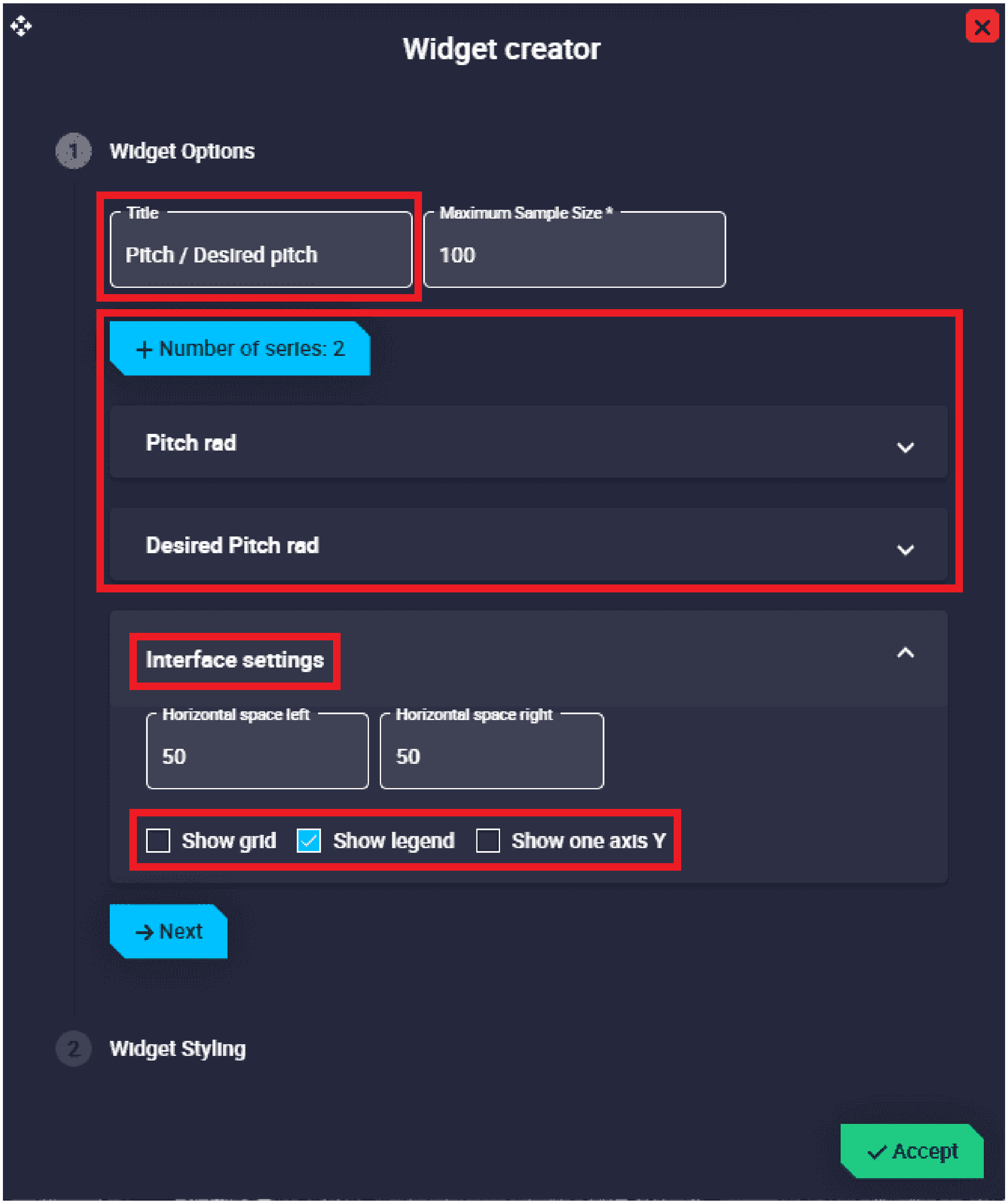


Fig. 263: **Chart example**

The custom configuration made for this chart is as follows:



Title: Pitch / Desired pitch

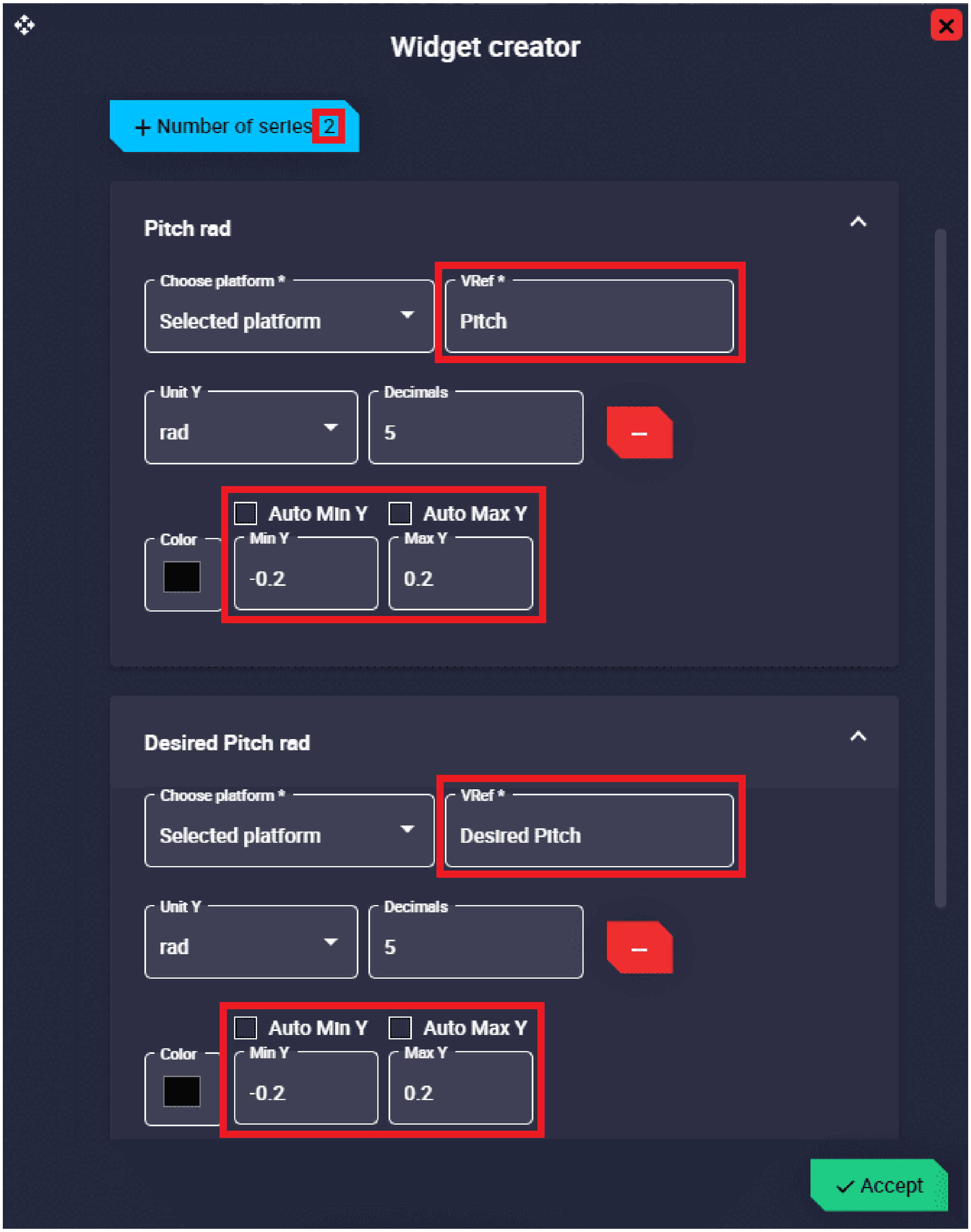
Maximum Sample Size *: 100

Horizontal space left: 50

Horizontal space right: 50

☐ Show grid ☑ Show legend ☐ Show one axis Y

Fig. 264: **Chart configuration - Widget Options example**



+ Number of series 2

Pitch rad

Choose platform *
Selected platform

VRef *
Pitch

Unit Y
rad

Decimals
5

Color

☐ Auto Min Y ☐ Auto Max Y

Min Y
-0.2

Max Y
0.2

Desired Pitch rad

Choose platform *
Selected platform

VRef *
Desired Pitch

Unit Y
rad

Decimals
5

Color

☐ Auto Min Y ☐ Auto Max Y

Min Y
-0.2

Max Y
0.2

Fig. 265: **Chart configuration - Series example**

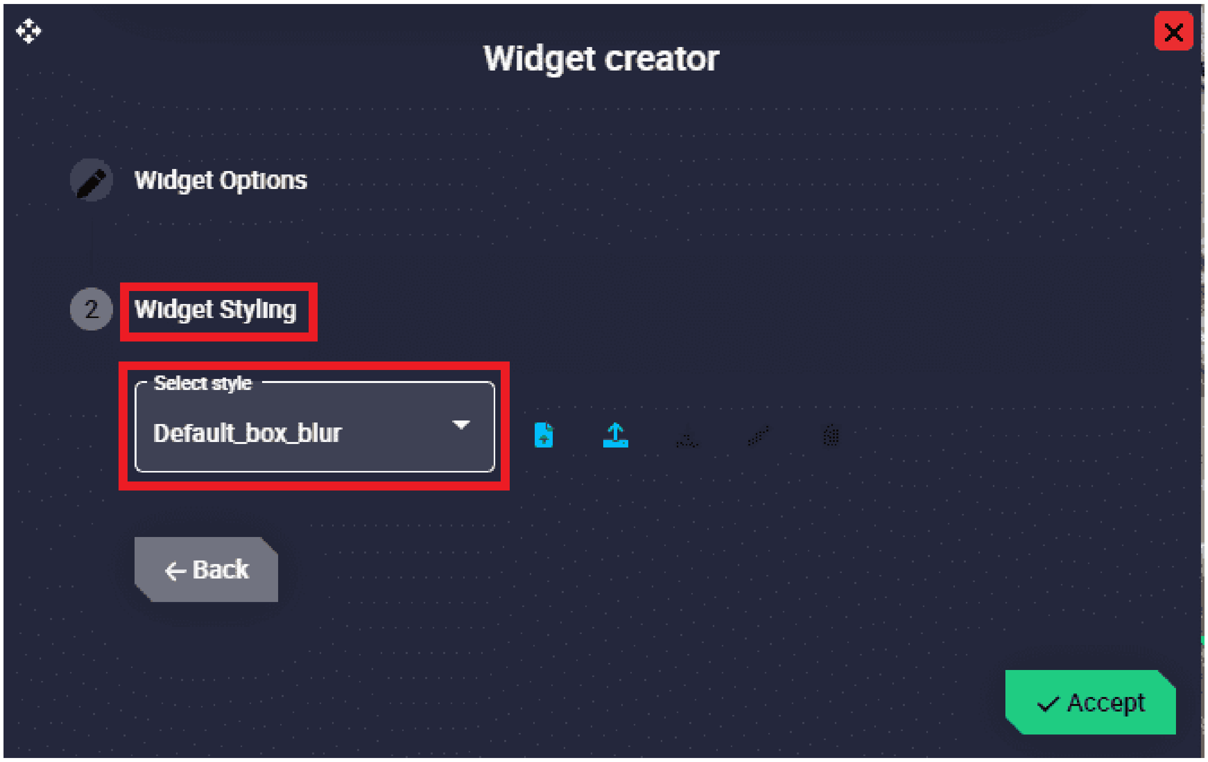


Fig. 266: **Chart configuration - Widget Styling example**

Scatter

Scatter widget allows the user to represent any variable in the system with respect to another variable.

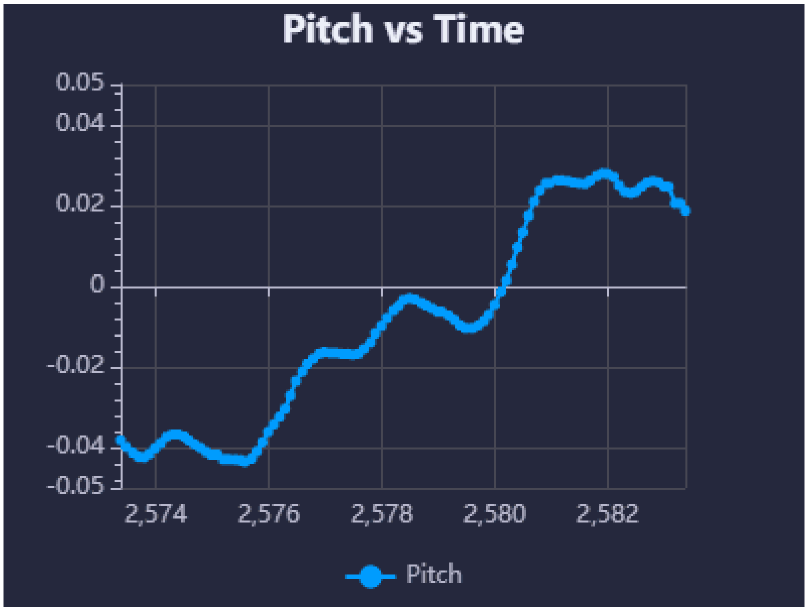


Fig. 267: **Scatter**

Right click on the **scatter** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Scatter configuration menu.

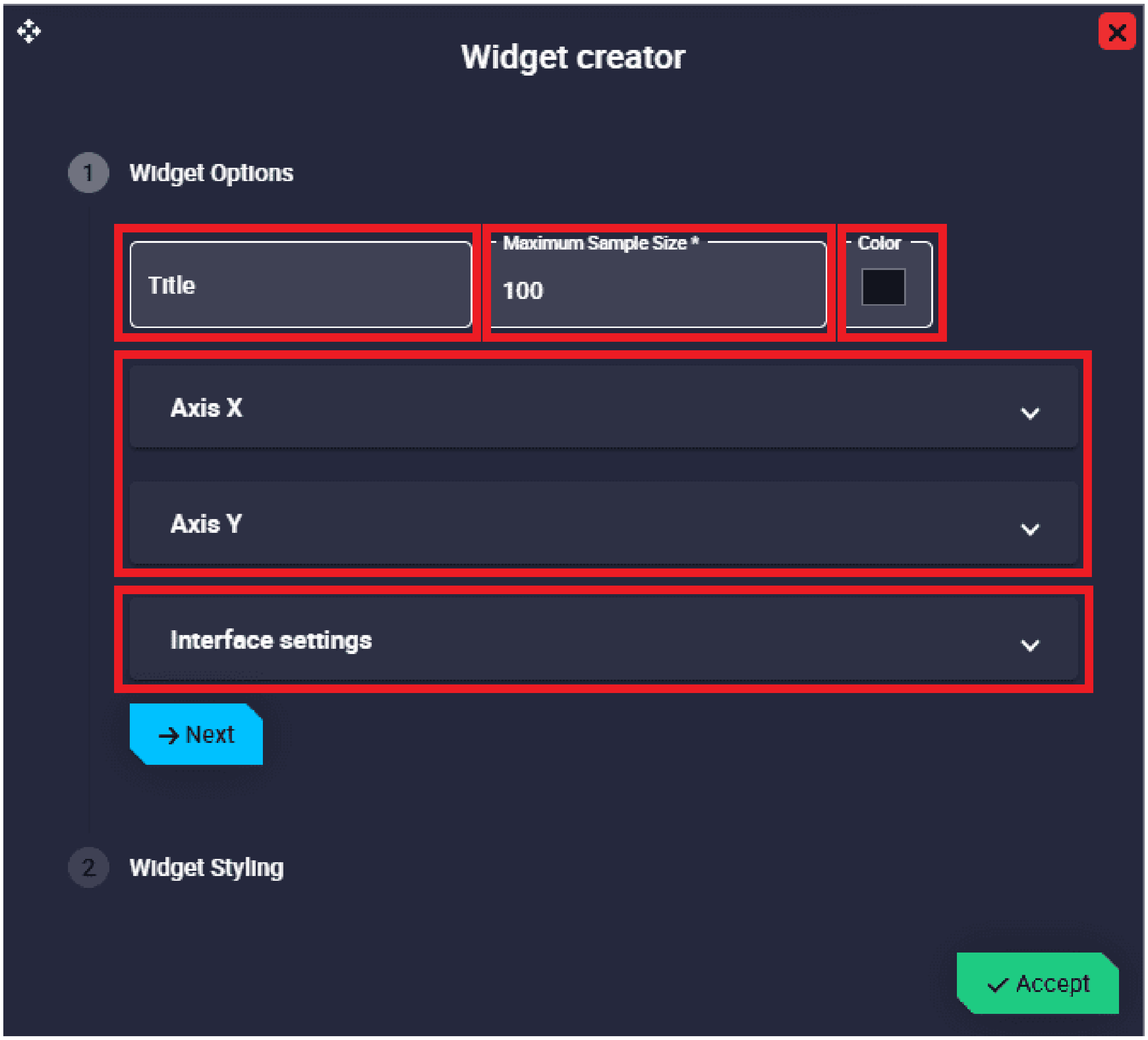
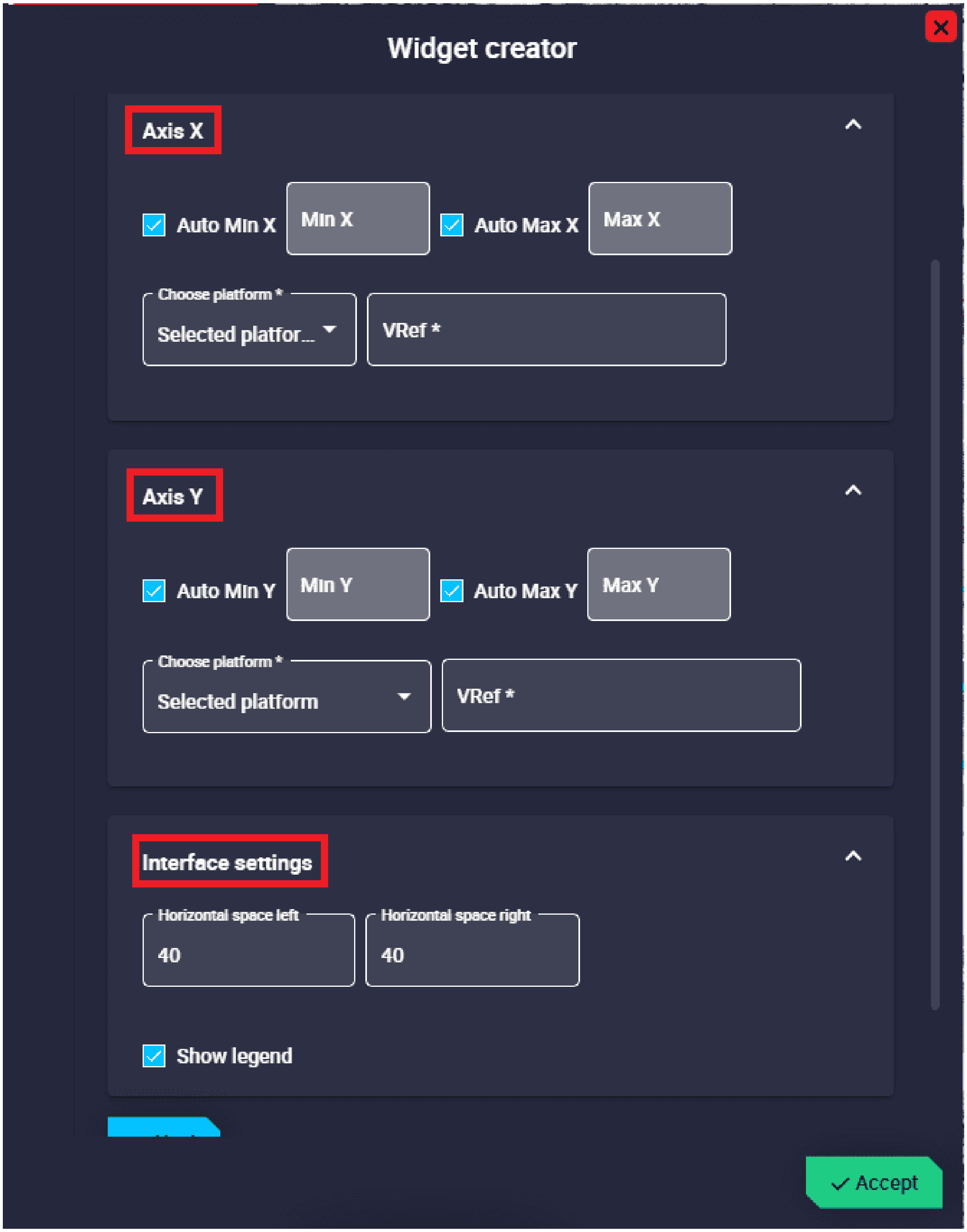


Fig. 268: **Scatter configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **Title**: Title of the scatter.
  - **Maximum Sample Size**: Maximum number of samples of the selected variables that are drawn in the scatter. By default it is set to 100.
  - **Color**: This is the color in which the values are drawn.



Axis X

☑ Auto Min X Min X ☑ Auto Max X Max X

Choose platform * Selected platfor... VRef *

Axis Y

☑ Auto Min Y Min Y ☑ Auto Max Y Max Y

Choose platform * Selected platform VRef *

Interface settings

Horizontal space left 40

Horizontal space right 40

☑ Show legend

Fig. 269: **Scatter configuration**

- **Axis X/Y**: The user must select the variables to be plotted on both axes. The appearance of the variables in the scatter can then be modified:

    - **Auto Min/Max X/Y**: If enabled, the minimum and maximum of the *X/Y* axes of the scatter are automatically adjusted.
    - **Min/Max X/Y**: The minimum and maximum *X/Y* axes of the scatter can be adjusted manually.
    - **VRef**: Users can choose any real, integer or bit variables to be displayed in the scatter.
    - **Unit and Decimals**: Attention!! **These are only available with Real variables**.
  - **Interface settings**:
    - **Horizontal space left/right**: The left/right horizontal spacing of the scatter background can be customized. By default they are set to 40.
    - **Show legend**: The legend of the variable on the *Y* axis can be shown/hidden in the scatter.

An example is given below:

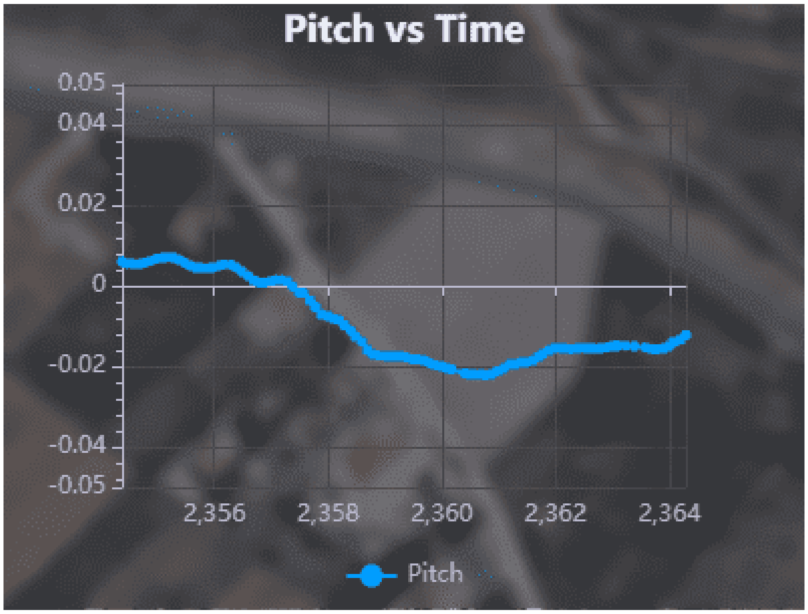
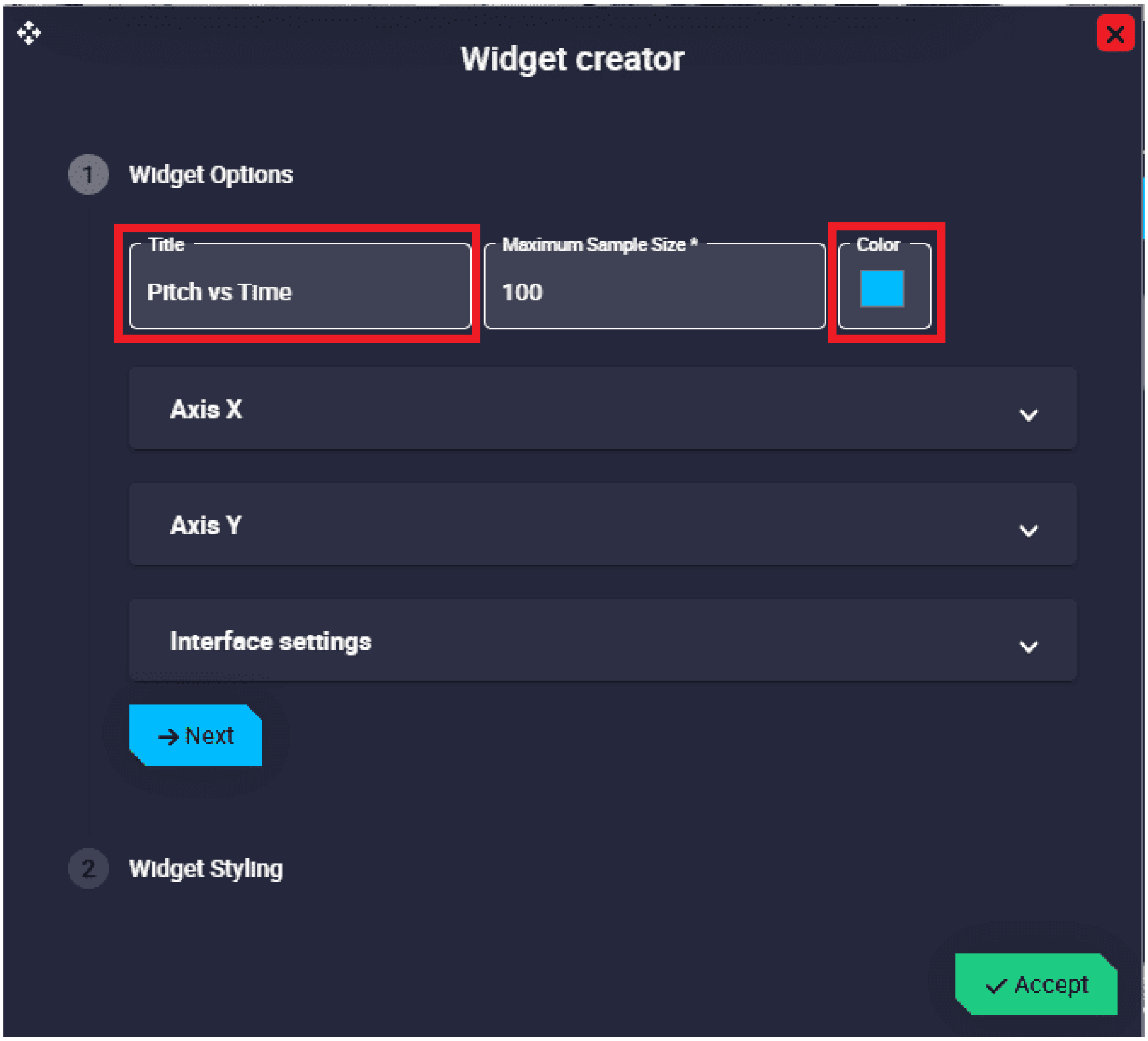


Fig. 270: **Scatter example**

The custom configuration made for this scatter is as follows:

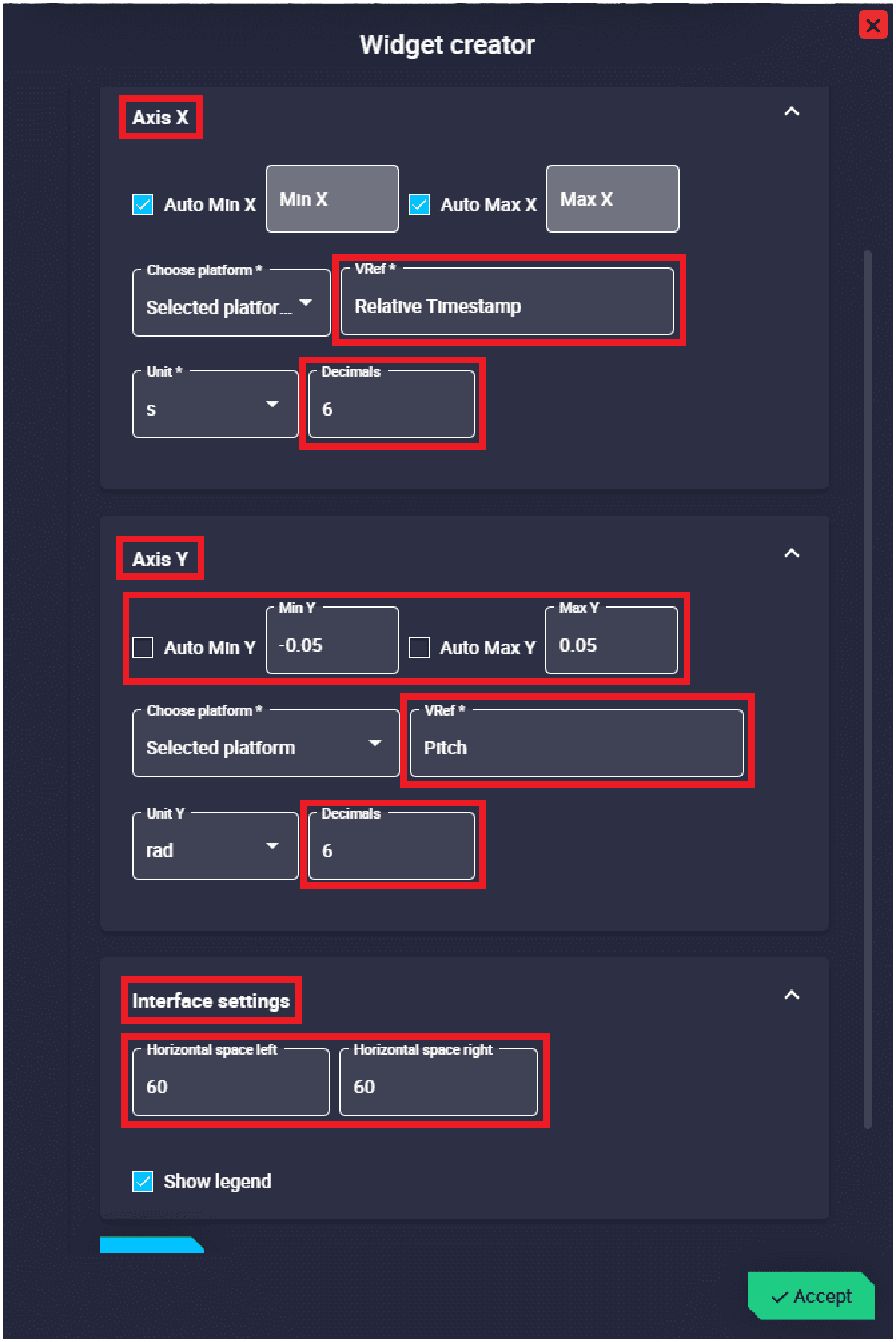


Title: Pitch vs Time

Maximum Sample Size *: 100

Color: 🟦

Fig. 271: **Scatter configuration - Widget Options example**



Axis X

☑ Auto Min X
Min X
☑ Auto Max X
Max X

Choose platform *: Selected platfor...
VRef *: Relative Timestamp
Unit *: s
Decimals: 6

Axis Y

☐ Auto Min Y
Min Y: -0.05
☐ Auto Max Y
Max Y: 0.05

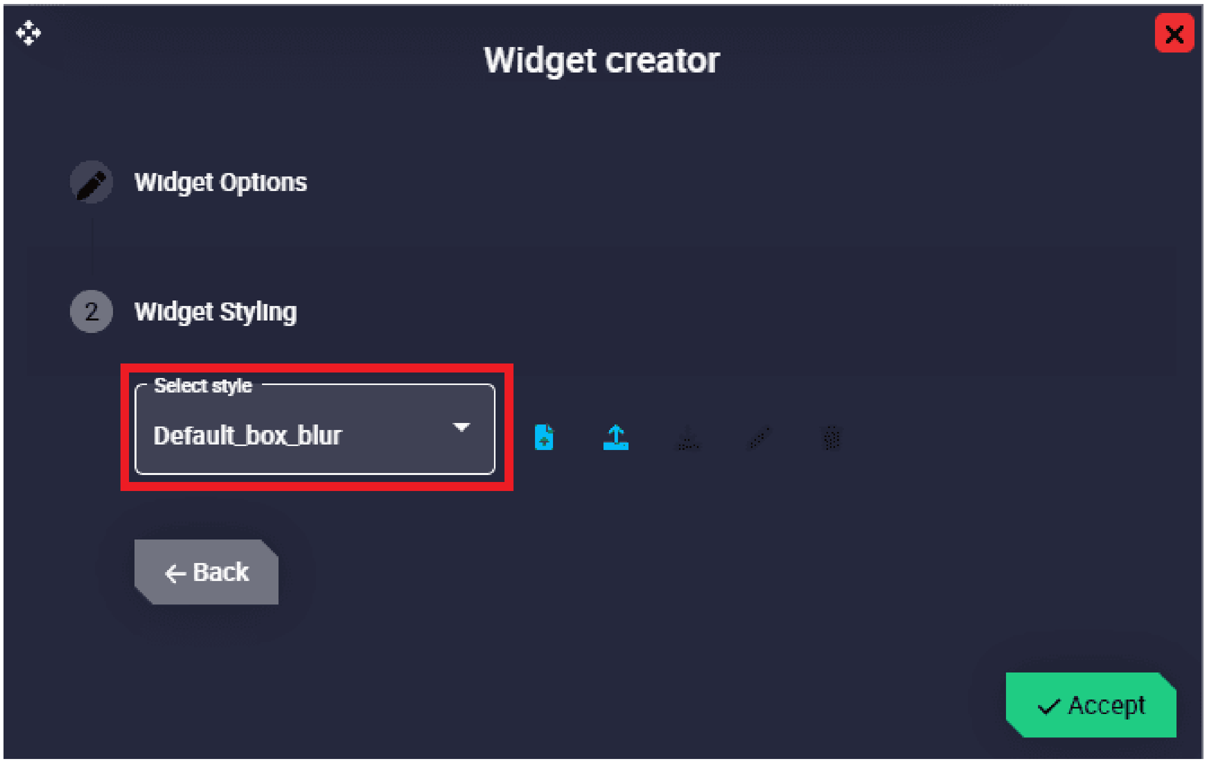
Choose platform *: Selected platform
VRef *: Pitch
Unit Y: rad
Decimals: 6

Interface settings

Horizontal space left: 60
Horizontal space right: 60

☑ Show legend

Fig. 272: **Scatter configuration - Widget Options example**



Select style

Default_box_blur

Fig. 273: **Scatter configuration - Widget Styling example**

Gauge

Gauge widget is a data visualisation tool that can be used to show the progress of data or display data in ranges in a precise and compact area.

This allows to display the progress of measuremetns in a circular arc or to see these numerical values in a range of colors that can have a certain meaning for the user.

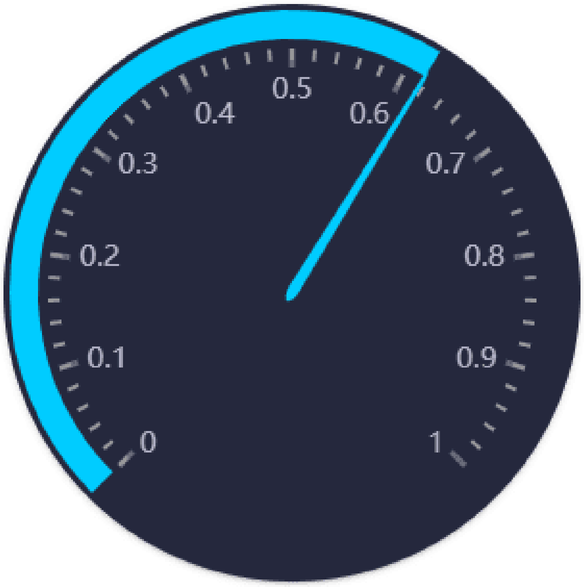


Fig. 274: **Gauge**

Right click on the **gauge** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Gauge configuration menu.

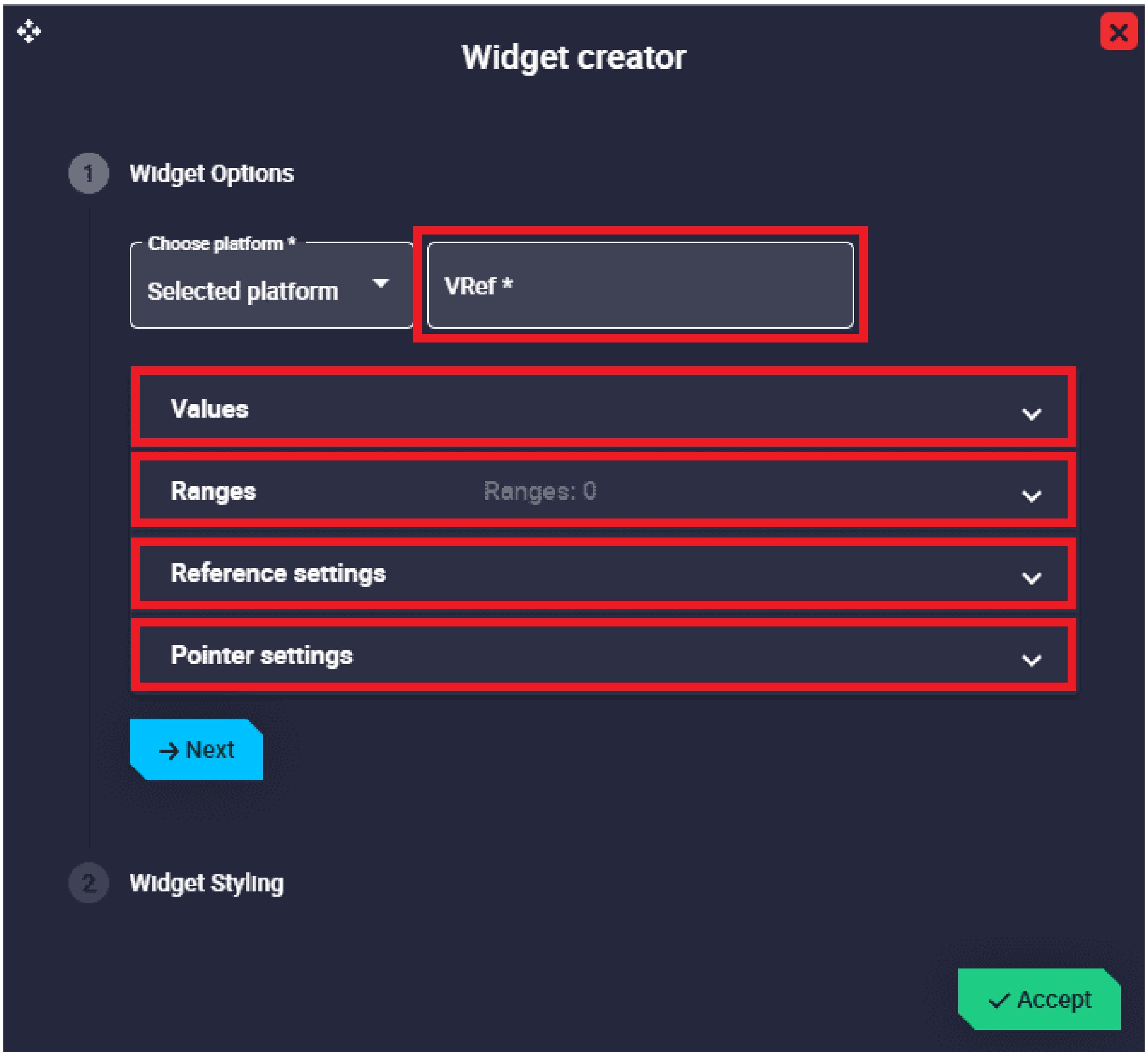
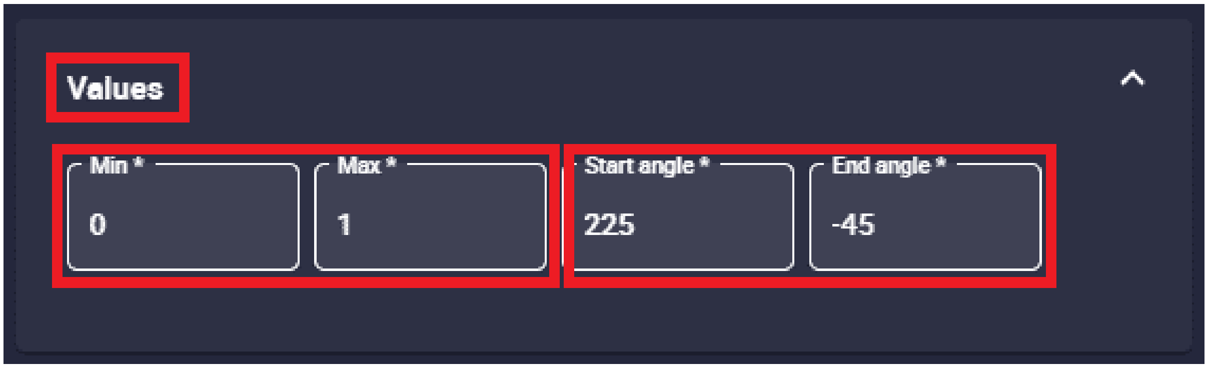


Fig. 275: **Gauge configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **VRef**: Users can choose any real, integer or bit variable to be displayed on the gauge.
  - **Unit and Decimals**: Attention!! **These are only available with Real variables**.
  - **Values**:



Values

Min * 0

Max * 1

Start angle * 225

End angle * -45

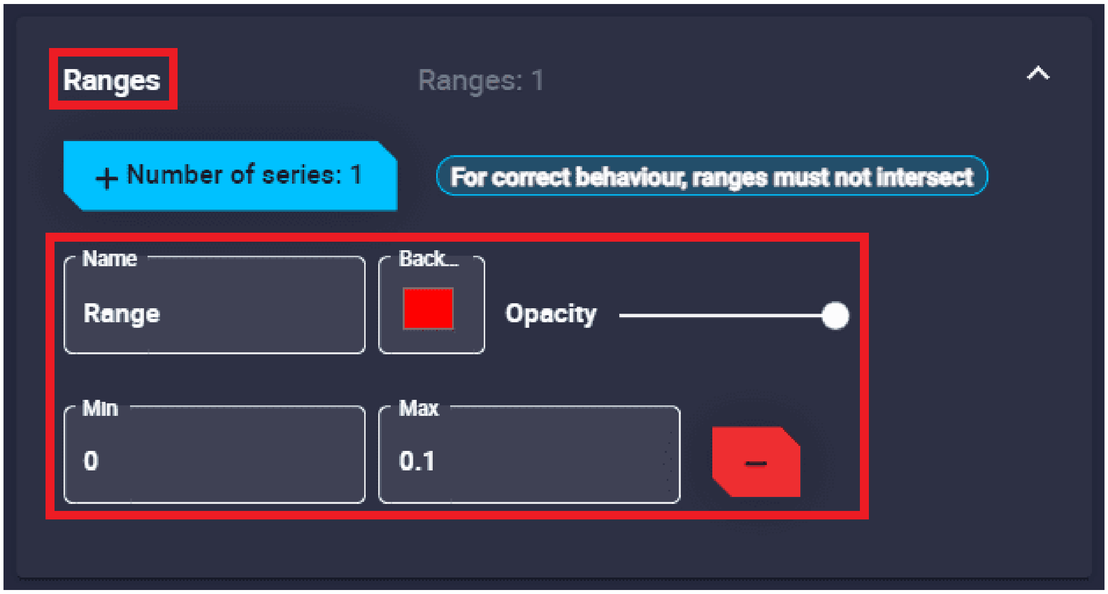
Fig. 276: **Gauge configuration - Values**

- **Min/Max**: Minimum and maximum values displayed on the gauge.
- **Start/End angle**: Start and end angle of the position of the minimum and maximum values respectively.

* **Ranges**: Allows the user to set different ranges.

> **Warning:** The panel warns the user that for correct behaviour, ranges must not intersect.

Several customizations can be made in the different ranges:



Ranges

Ranges: 1

+ Number of series: 1

For correct behaviour, ranges must not intersect

Name Range

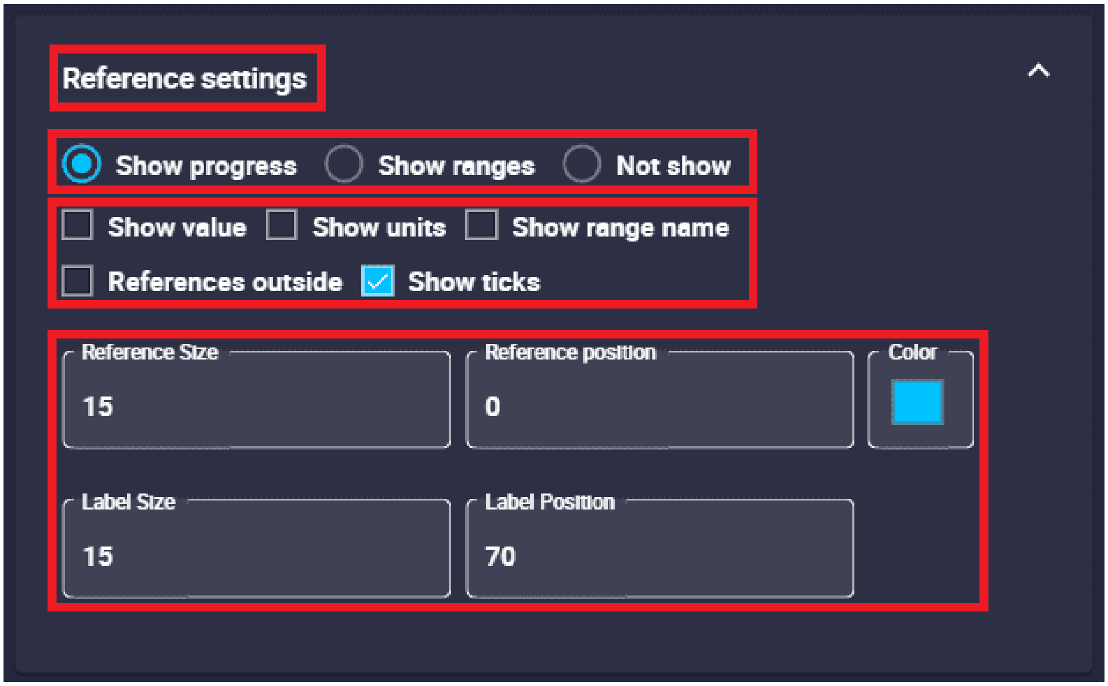
Min 0

Max 0.1

Fig. 277: **Gauge configuration - Ranges**

- **Name**: An identifying name for the range can be set.
- **Background color**: Sets the color of the gauge arc in this range.
- **Opacity**: The opacity of the circular arc can be customized in this range.
- **Min/Max**: Defines the minimum and maximum values of the range.
- **Remove**: Click to delete this range.

- **Reference settings**:



Reference settings

● Show progress ○ Show ranges ○ Not show

☐ Show value ☐ Show units ☐ Show range name

☐ References outside ☑ Show ticks

Reference Size: 15

Reference position: 0

Color

Label Size: 15

Label Position: 70

Fig. 278: **Gauge configuration - Reference settings**

The gauge can be configured to display the progress of the values on the arc, to be displayed with color ranges according to the values or only with a needle indicating the value of the selected variable:

- **Show Progress**: Shows the progress arc of the selected variable in the gauge.
- **Show Ranges**: Displays the gauge with the previously defined ranges.
- **Not Show**: The needle indicates the value but neither the progress nor the ranges are shown in the gauge.

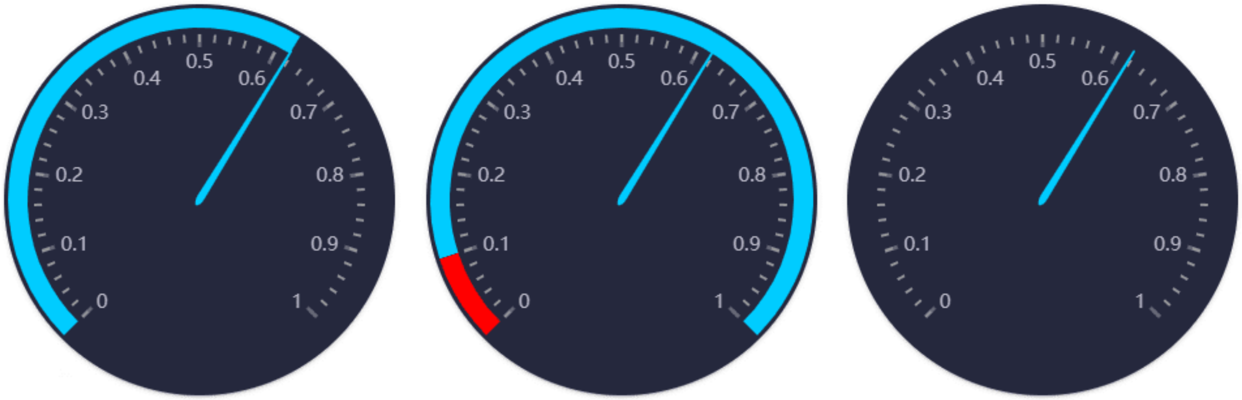


Fig. 279: **Reference settings - 'Show Progress/Ranges' and 'Not Show' respectively**

Reminder

Only one of the three options described below can be selected.

In addition, this widget is highly customizable so that users can configure it to their wishes:

- **Show Value**: If enabled, displays on the gauge the value of the selected variable that the needle is pointing to.
- **Show Units**: If enabled, displays the units of the value of the selected variable that the needle is pointing to.
- **Show range name**: If enabled, it displays, next to the value, the name of the range (previously defined) in which the value is in.

  In addition, the color of this text will be the same as that of its corresponding range.
- **References Outside**: References refers to the displayed axis and its numbering.

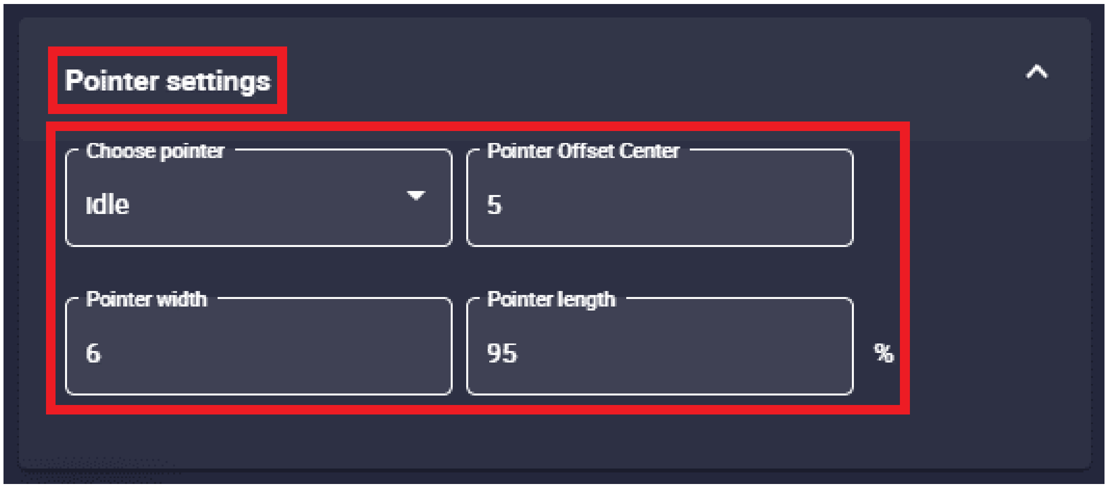
  By default, the arc axis numbering is "inside" the arc, by enabling it, it will be in the "outside" part.
- **Show Ticks**: Axis ticks can be shown/hidden. By default it is enabled, i.e. they are shown.
- **Reference Size**: The size of the axis numbering can be modified.
- **Reference position**: The position of the axis numbering can be adjusted by the user.

  The default position is 0.
- **Label Size**: The size of the text value can be modified.
- **Label Position**: The position of the value can be adjusted.

  The default position is at 70, at the bottom of the gauge. If set to 0, the label will be in the center of the gauge.
- **Color**: This is the color in which the value is drawn.

Note: When '**Show Ranges**' option is selected, the color of the value is not this selected color, but is colored according to the color of range the value is in.

* **Pointer settings**: Here the user can configure the pointer of the gauge.



Pointer settings

Choose pointer: Idle

Pointer Offset Center: 5

Pointer width: 6

Pointer length: 95 %

Fig. 280: **Gauge configuration - Pointer settings**

- **Choose pointer**: Users can choose a desired pointer from the list. If **none** is selected, no pointer will be drawn.
- **Pointer Offset Center**: Position of the "start" of the needle with respect to the center of the gauge. Default is set to 5.
- **Poiter width**: Width of the pointer. The default width is 6.
- **Pointer length**: Pointer length is set as a percentage of the distance between the centet and the edge of the gauge.

An example is given below:

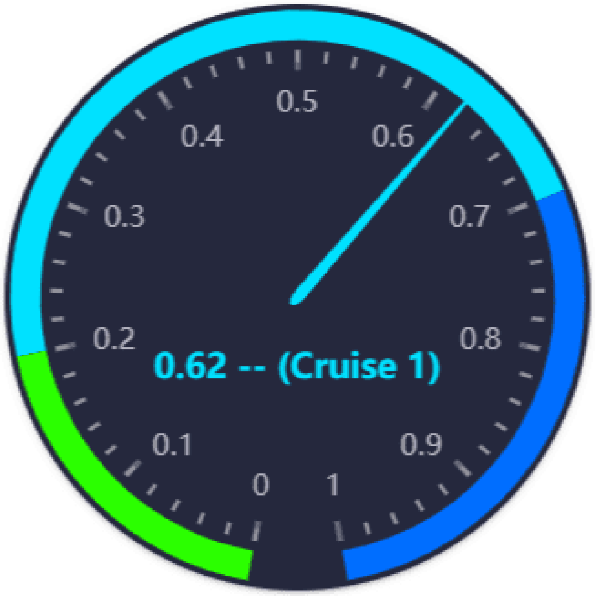
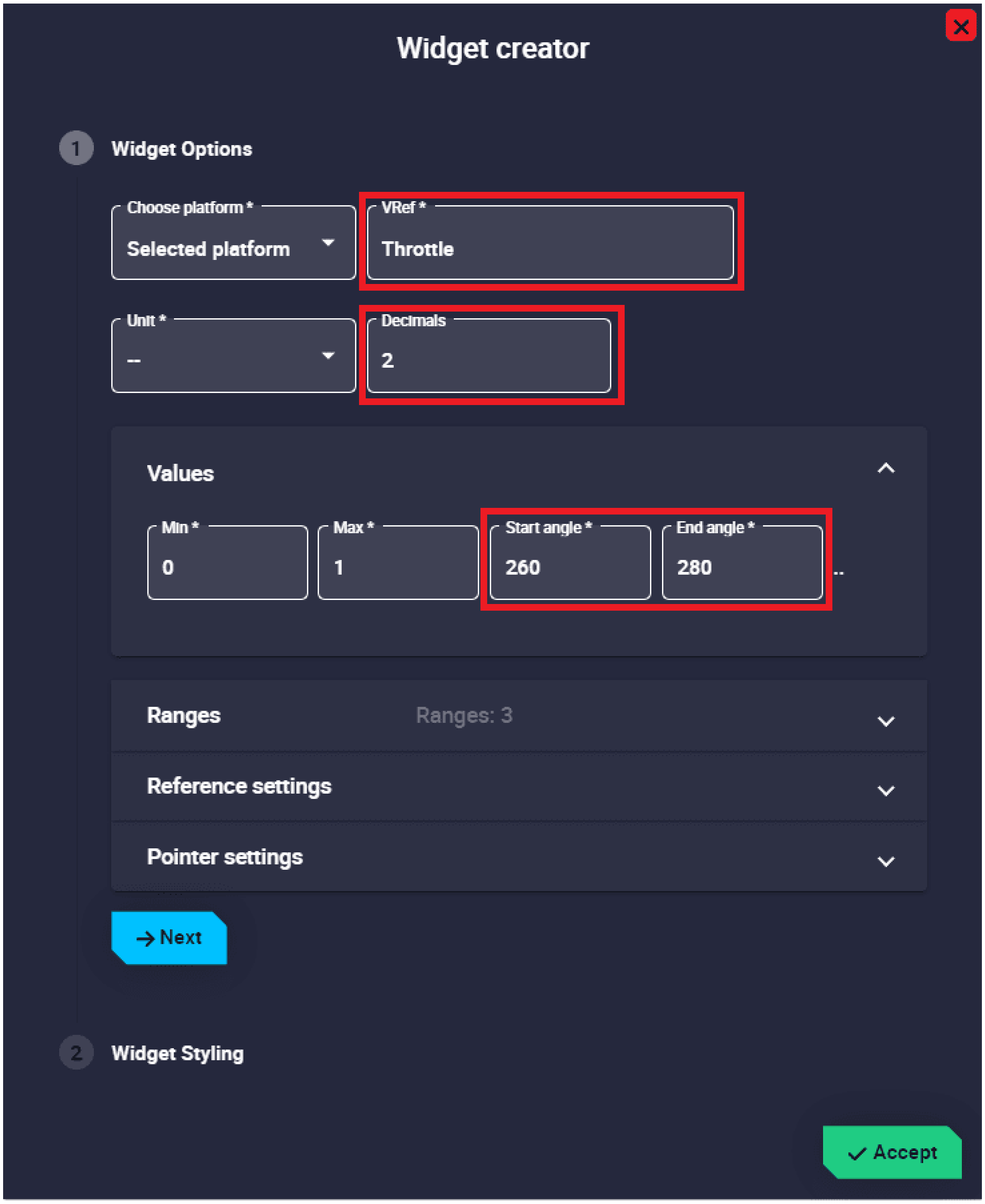


Fig. 281: **Gauge example**

The custom configuration made for this gauge is as follows:



Widget creator

1 Widget Options

Choose platform *: Selected platform

VRef *: Throttle

Unit *: --

Decimals: 2

Values

Min *: 0

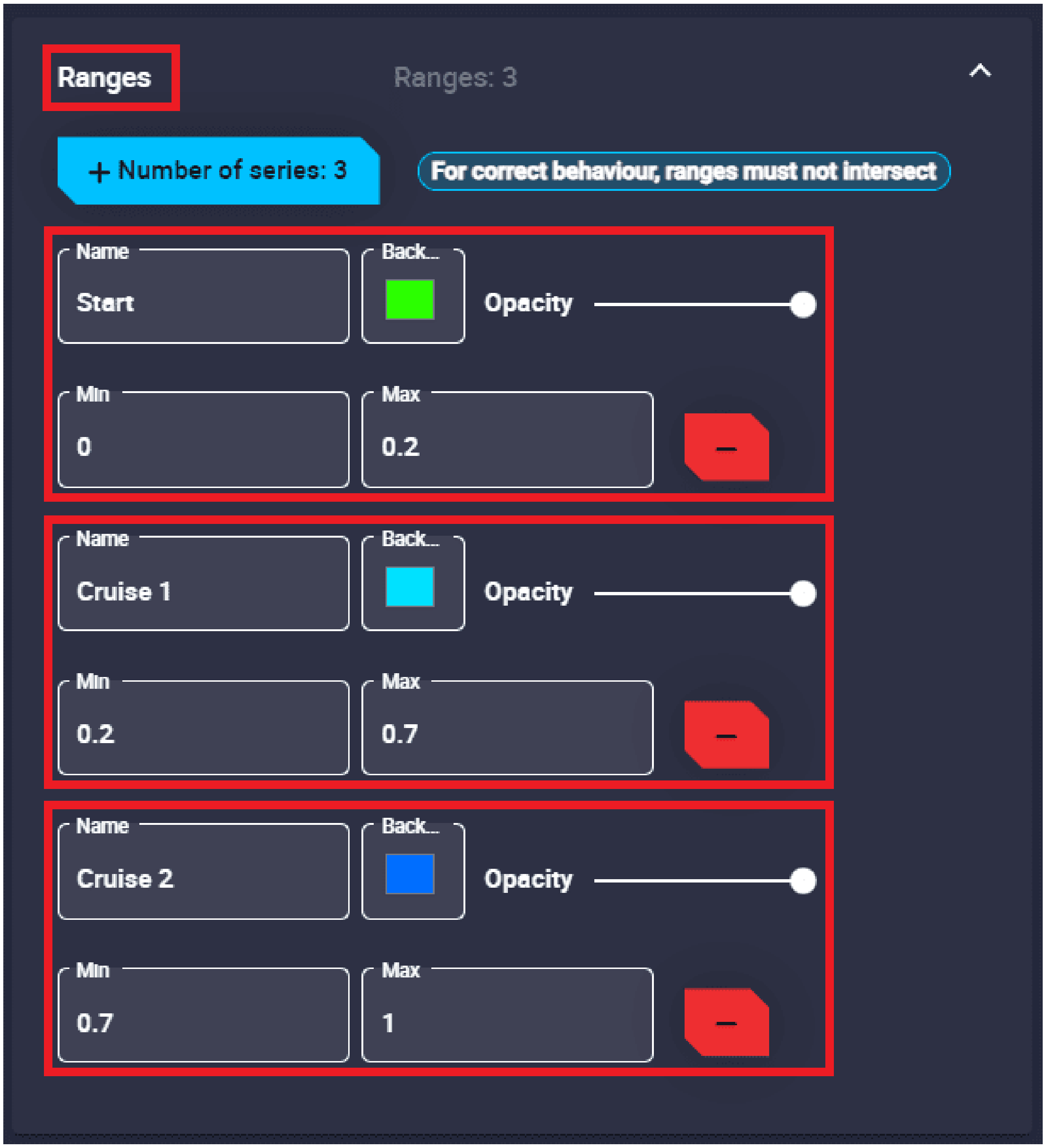
Max *: 1

Start angle *: 260

End angle *: 280

Ranges: 3

Fig. 282: **Gauge configuration - Values example**

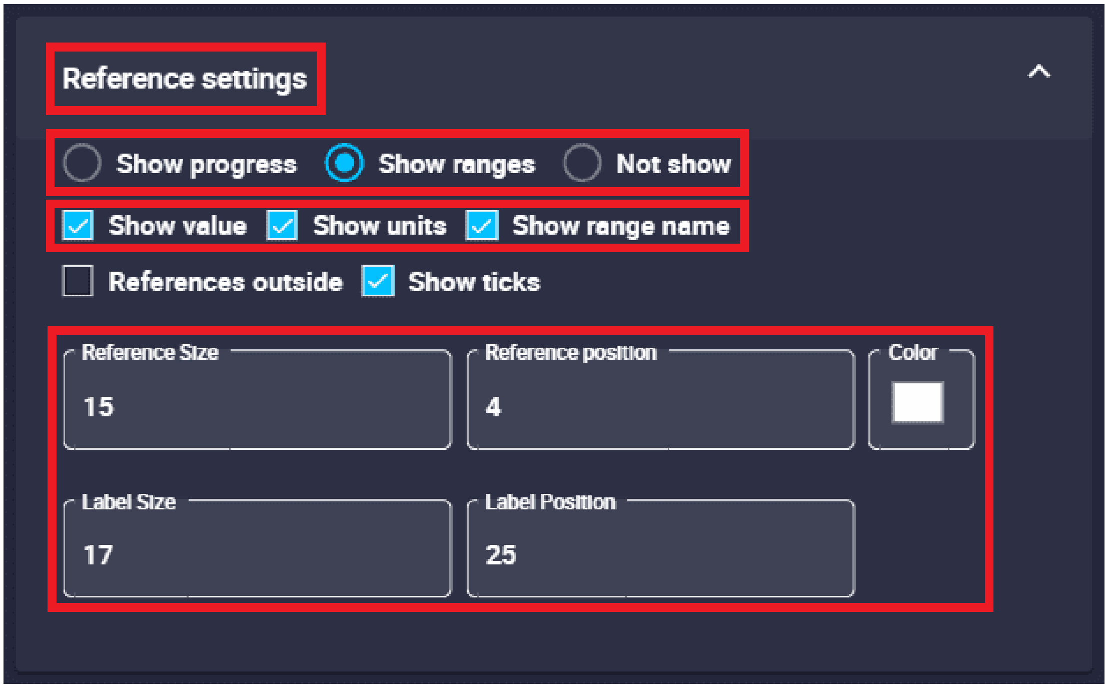


Name: Start
Back... 🟩
Opacity
Min: 0
Max: 0.2

Name: Cruise 1
Back... 🟦
Opacity
Min: 0.2
Max: 0.7

Name: Cruise 2
Back... 🟦
Opacity
Min: 0.7
Max: 1

Fig. 283: **Gauge configuration - Ranges example**



Reference settings

○ Show progress ● Show ranges ○ Not show

☑ Show value ☑ Show units ☑ Show range name

☐ References outside ☑ Show ticks

Reference Size: 15

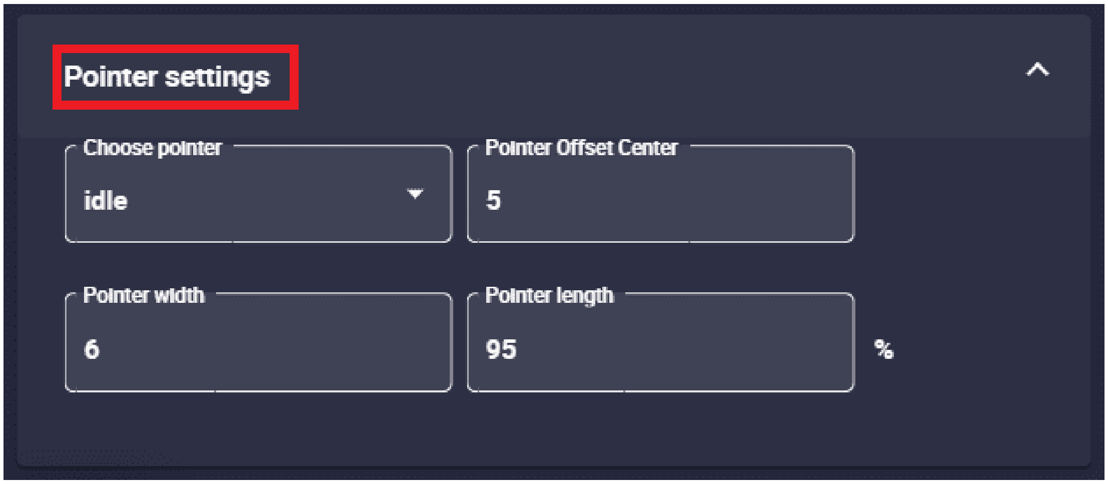
Reference position: 4

Color: ⬜

Label Size: 17

Label Position: 25

Fig. 284: **Gauge configuration - Reference settings example**



Pointer settings

Choose pointer: idle

Pointer Offset Center: 5

Pointer width: 6

Pointer length: 95 %

Fig. 285: **Gauge configuration - Pointer settings example**

Bar

Bar widget graphically displays the value of a selected variable by means of a bar. In addition, color ranges can be specified according to specific values.

The appearance of this widget is highly customisable, allowing the user to adapt it to the desired use.

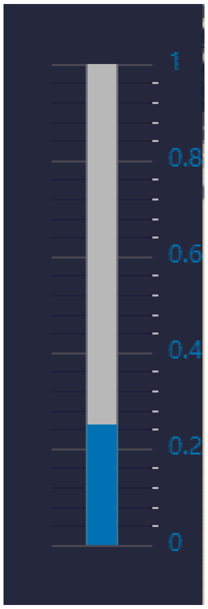


Fig. 286: **Bar**

Right click on the **bar** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Bar configuration menu.

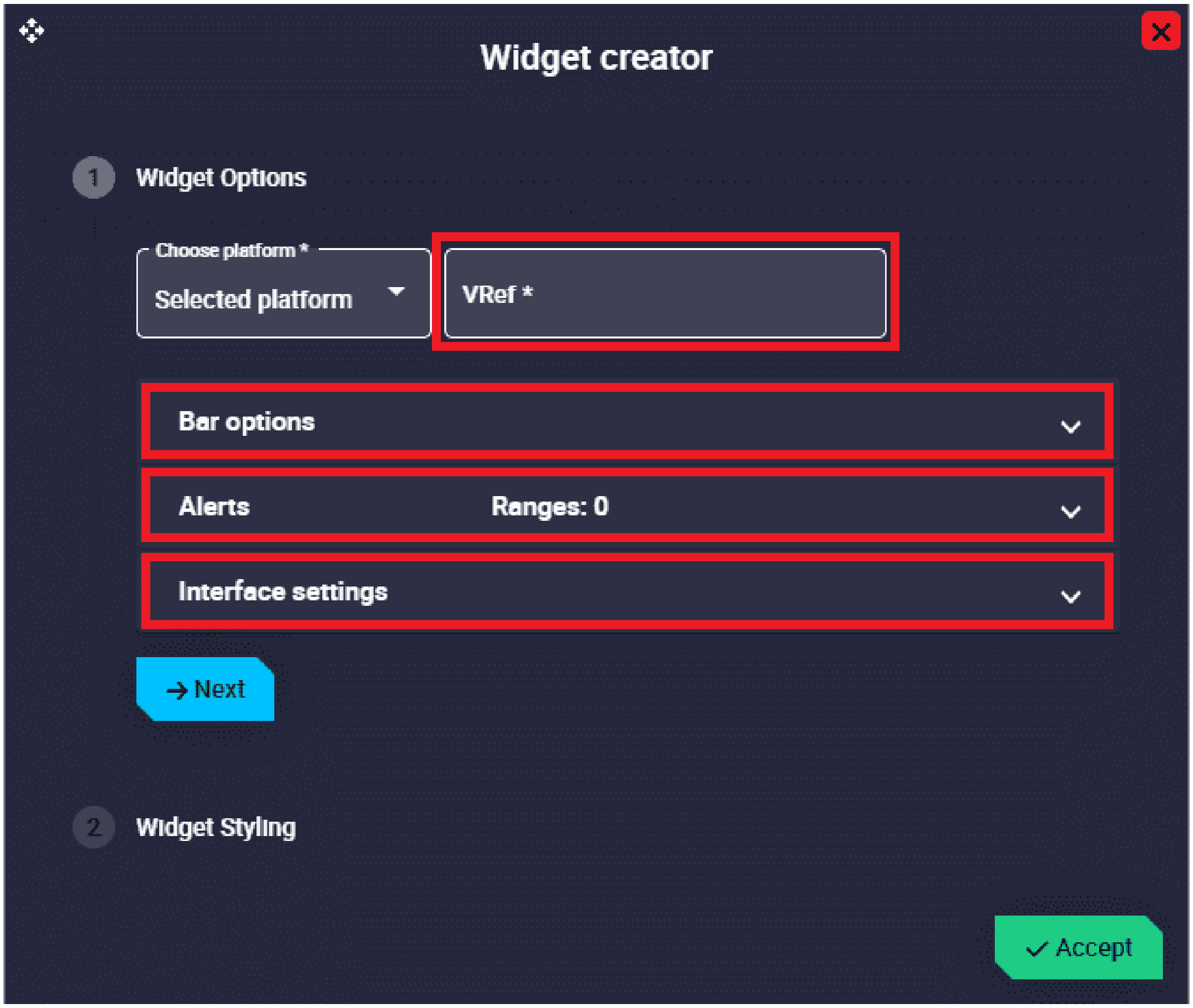


Fig. 287: **Bar configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **VRef**: Users can choose any real, integer or bit variable to be displayed on the bar.
  - **Unit and Decimals**: Attention!! **These are only available with Real variables**.
  - **Bar options**:

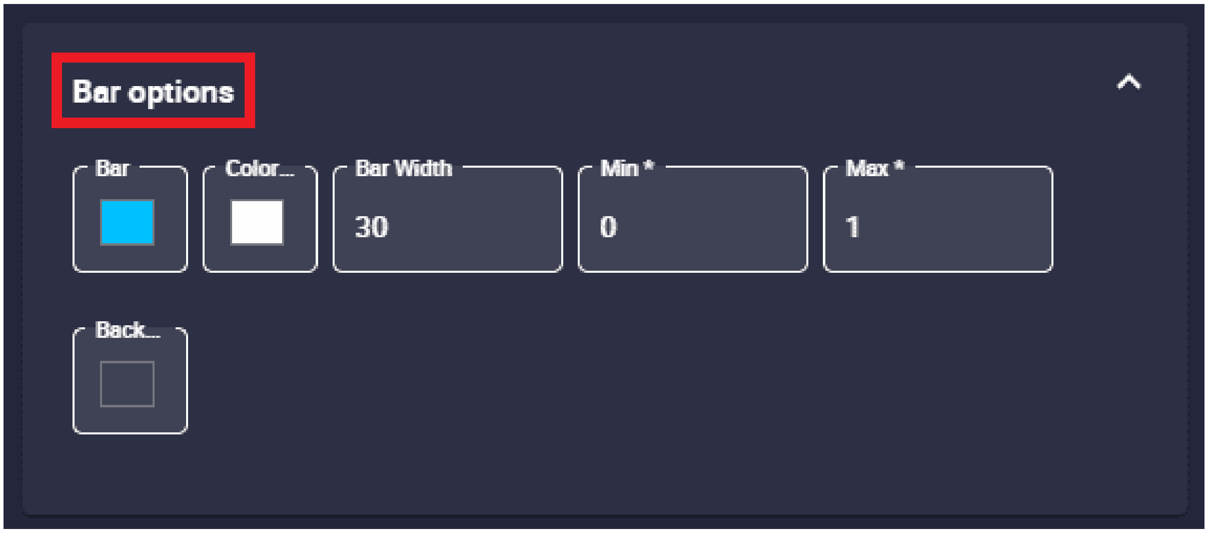


Fig. 288: **Bar configuration - Bar options**

- **Bar color**: The color of the bar with the value can be changed here.
- **Color text**: The color of the selected variable value can be modified.
- **Bar width**: The user can modify the width of the bar as desired. By default it is set to 30.
- **Min/Max**: Minimum and maximum values displayed in the bar.
- **Background color**: The color of the background bar can be set here.

  For example, if the value is 0, the bar will be colored with this color. But if the value is 1, this color will be covered by the bar color specified in the parameter '**Bar color**'.

∗ **Alerts**: Allows the user to set different ranges. For these ranges several customizations can be made:

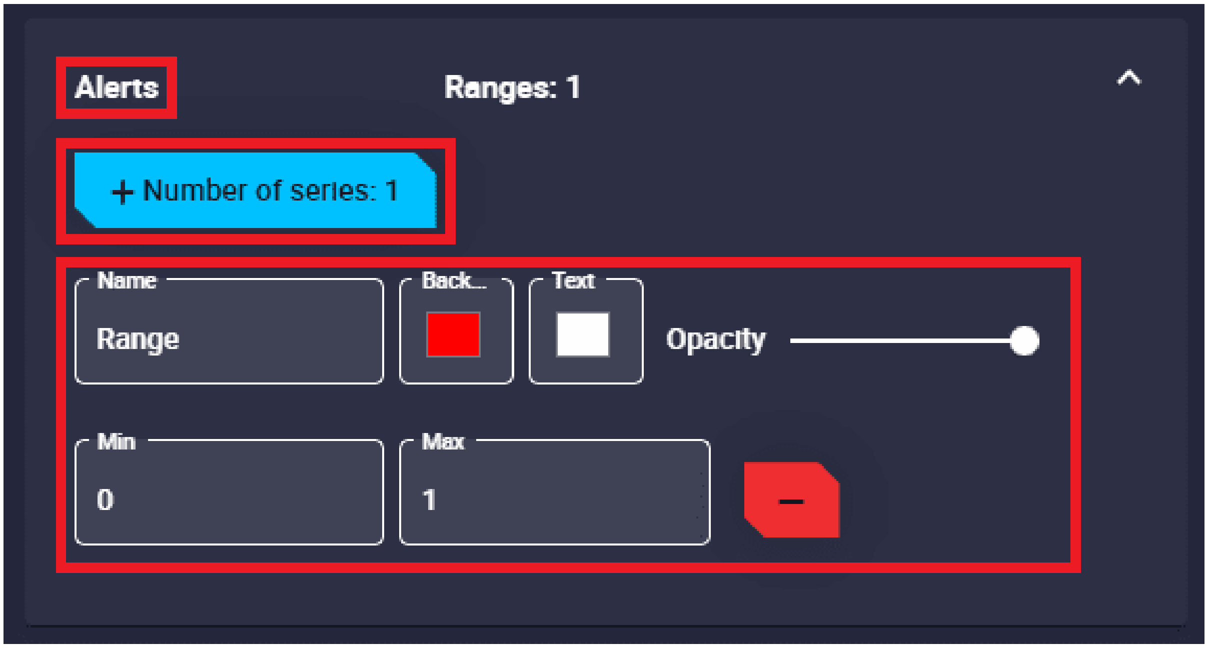
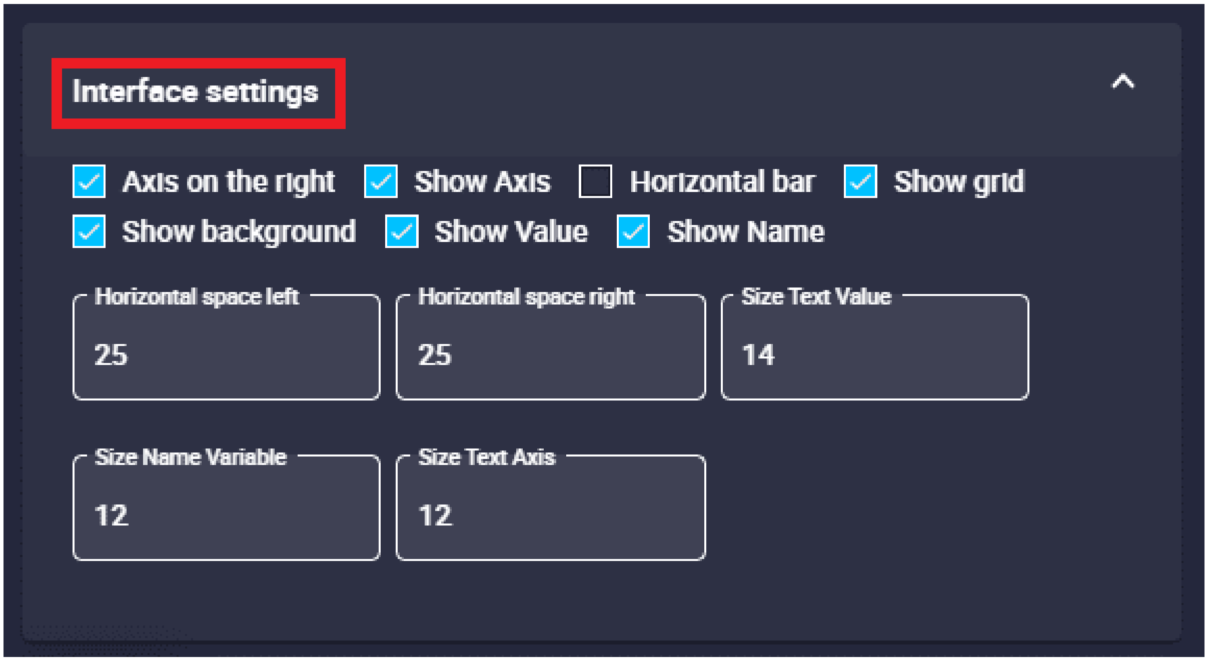


Fig. 289: **Bar configuration - Alerts**

  - **Name**: An indentifier name of the range can be set.
  - **Background color**: Sets the color of the bar for this range.
  - **Text color**: Changes the color of the selected variable value in this range.
  - **Opacity**: The opacity of the bar can be customized in this range.
  - **Min/Max**: Defines the minimum and maximum values of the range.
  - **Remove**: Click to delete this range.

- **Interface settings**:



☑ Axis on the right ☑ Show Axis ☐ Horizontal bar ☑ Show grid
☑ Show background ☑ Show Value ☑ Show Name

Horizontal space left: 25
Horizontal space right: 25
Size Text Value: 14
Size Name Variable: 12
Size Text Axis: 12

Fig. 290: **Bar configuration - Interface settings**

The appearance of the bar widget can be highly customized using the following parameters:

  - **Axis on the right**: If enabled, the axis is placed to the right of the bar, otherwise to the left. By default it is enabled.
  - **Show axis**: If enabled, the axis of the bar is shown, otherwise it is hidden. By default it is enabled.
  - **Horizontal bar**: If enabled, the bar and the axis are displayed in horizontal format, otherwise it is in vertical position. By default disabled (in vertical position).
  - **Show grid**: If enabled, a grid with the subdivisions of the axes is shown, otherwise it is hidden. By default it is enabled.
  - **Show background**: If enabled, the rest of the bar that is not colored by the value is shown with the color previously defined in **Bar options**. By default it is enabled.
  - **Show Value**: If enabled, shows the value of the selected variable in the bar. By default it is enabled.
  - **Show Name**: If enabled, the name of the selected variable is displayed at the bottom of the bar. By default it is enabled.

- **Horizontal space left/right**: The left/right horizontal spacing of the bar widget background can be customized. By default they are set to 25.
- **Size Text Value**: The size of the text value can be modified. Default is 14.
- **Size Name Variable**: The size of the selected variable name can be changed. Default is 12.
- **Size Text Axis**: The size of the axis text can be modified. Default is 12.

Some examples are given below:

- **Example 1**:

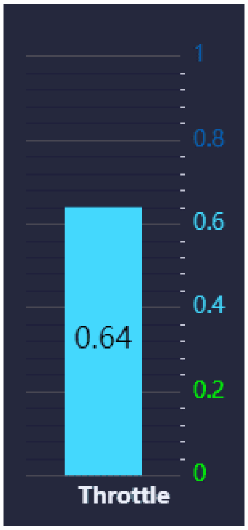
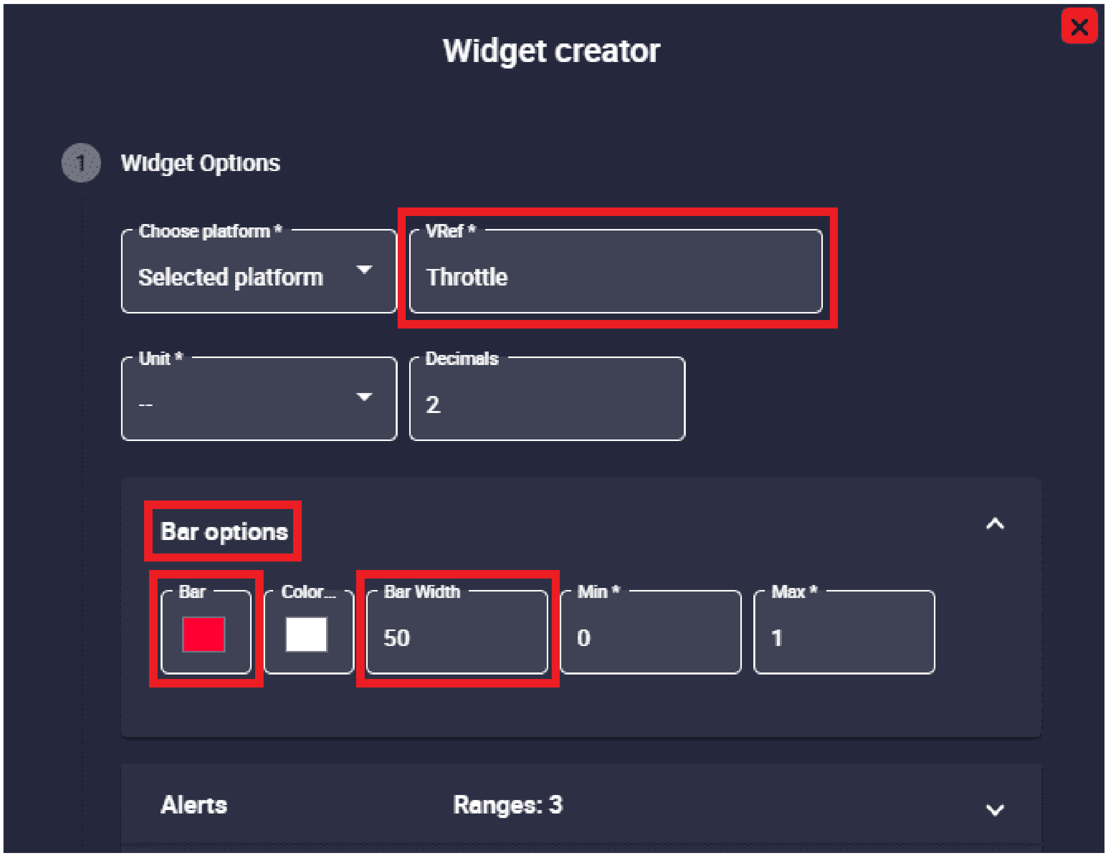


Fig. 291: **Bar example 1**

The custom configuration made for this bar is as follows:



Choose platform *: Selected platform

VRef *: Throttle

Unit *: --

Decimals: 2

Bar: 🟥

Color...: ⬜

Bar Width: 50

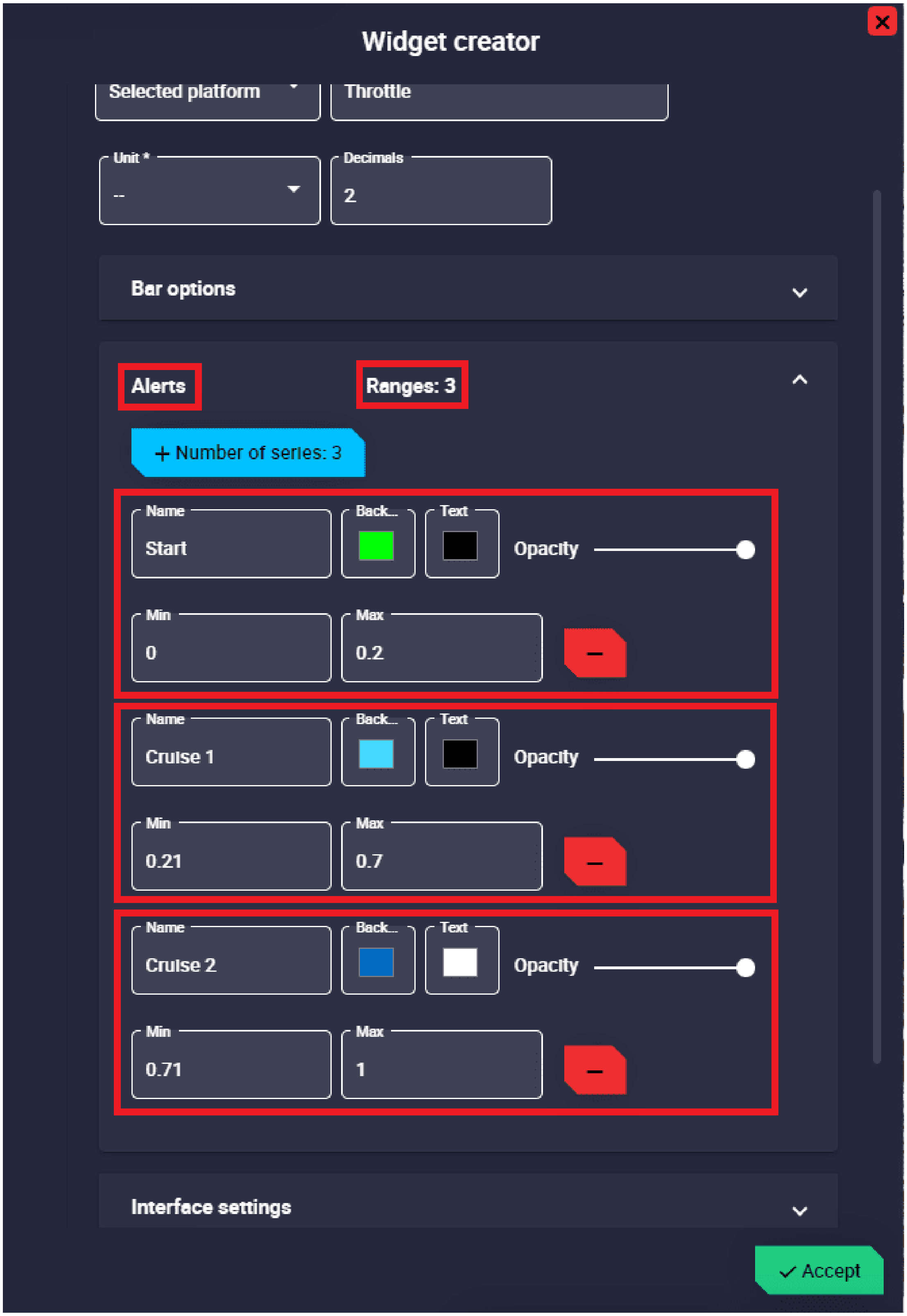
Min *: 0

Max *: 1

Ranges: 3

Fig. 292: **Bar configuration - Bar options example 1**

As shown in the figure above, when the background bar is hidden (‘Show background’ option is disabled), the ‘**Background color**’ parameter does not appear.



Widget creator

Selected platform: Throttle

Unit *: --

Decimals: 2

Bar options

Alerts **Ranges: 3**

+ Number of series: 3

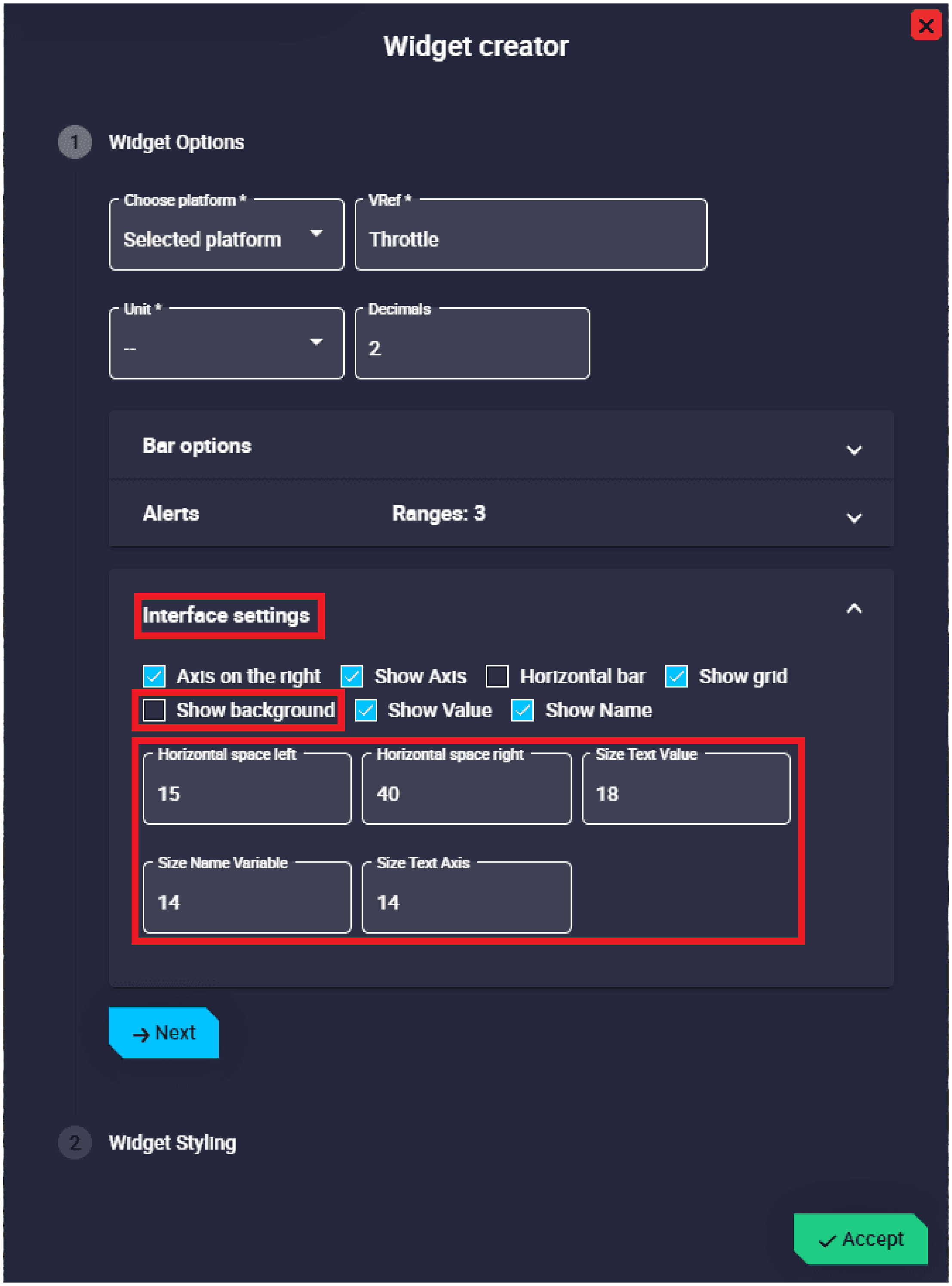
Name: Start · Back..: 🟩 · Text: ⬛ · Opacity
Min: 0 · Max: 0.2

Name: Cruise 1 · Back..: 🟦 · Text: ⬛ · Opacity
Min: 0.21 · Max: 0.7

Name: Cruise 2 · Back..: 🟦 · Text: ⬜ · Opacity
Min: 0.71 · Max: 1

Interface settings

Fig. 293: **Bar configuration - Alerts example 1**



Choose platform *: Selected platform

VRef *: Throttle

Unit *: --

Decimals: 2

Alerts Ranges: 3

Interface settings

☑ Axis on the right ☑ Show Axis ☐ Horizontal bar ☑ Show grid

☐ Show background ☑ Show Value ☑ Show Name

Horizontal space left: 15

Horizontal space right: 40

Size Text Value: 18

Size Name Variable: 14

Size Text Axis: 14

Fig. 294: **Bar configuration - Reference settings example 1**

- **Example 2**:

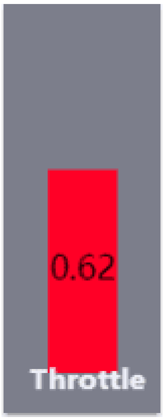
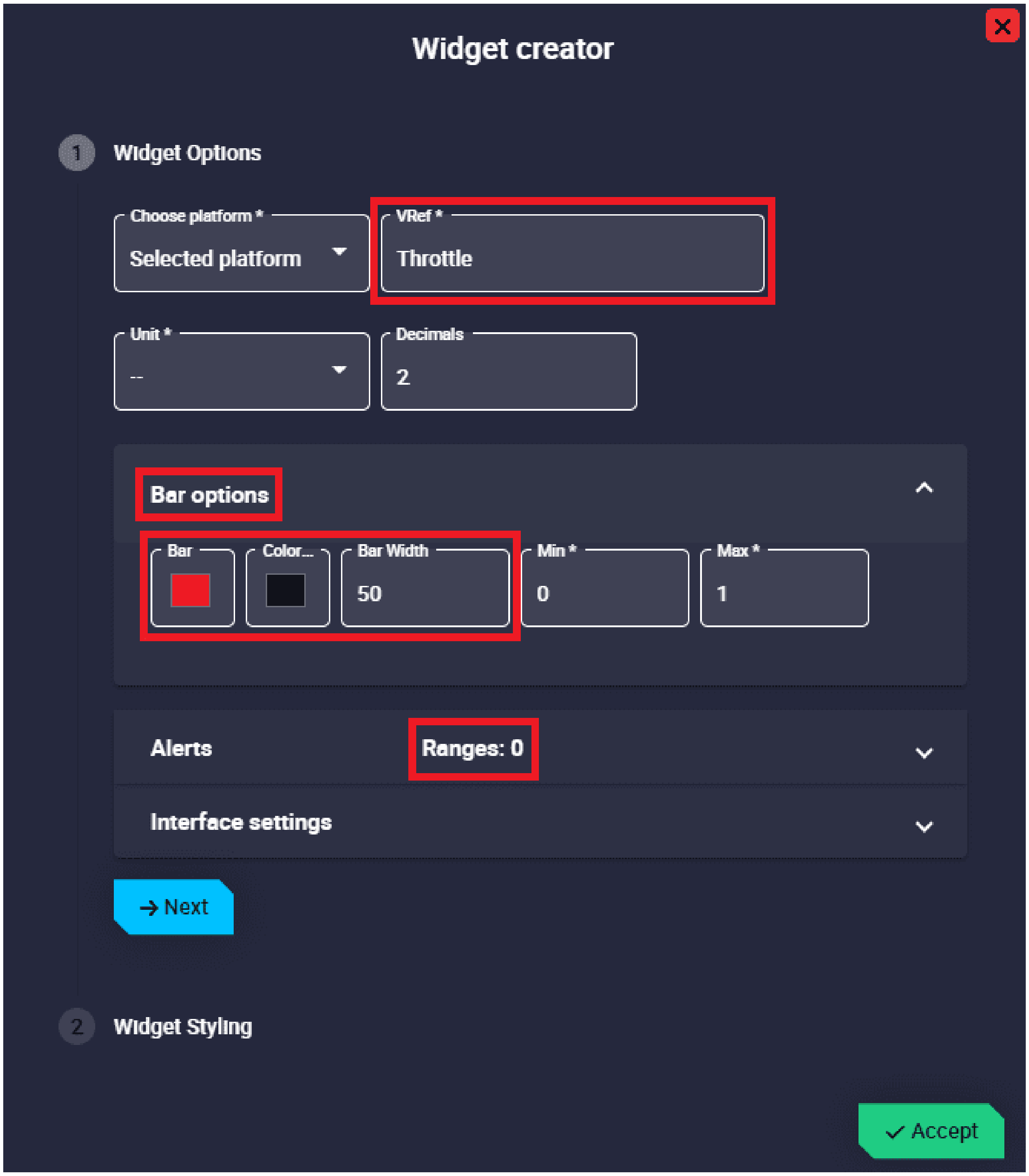


Fig. 295: **Bar example 2**

The custom configuration made for this bar is as follows:



Choose platform *: Selected platform

VRef *: Throttle

Unit *: --

Decimals: 2

Bar: 🟥

Color...: ■

Bar Width: 50

Min *: 0

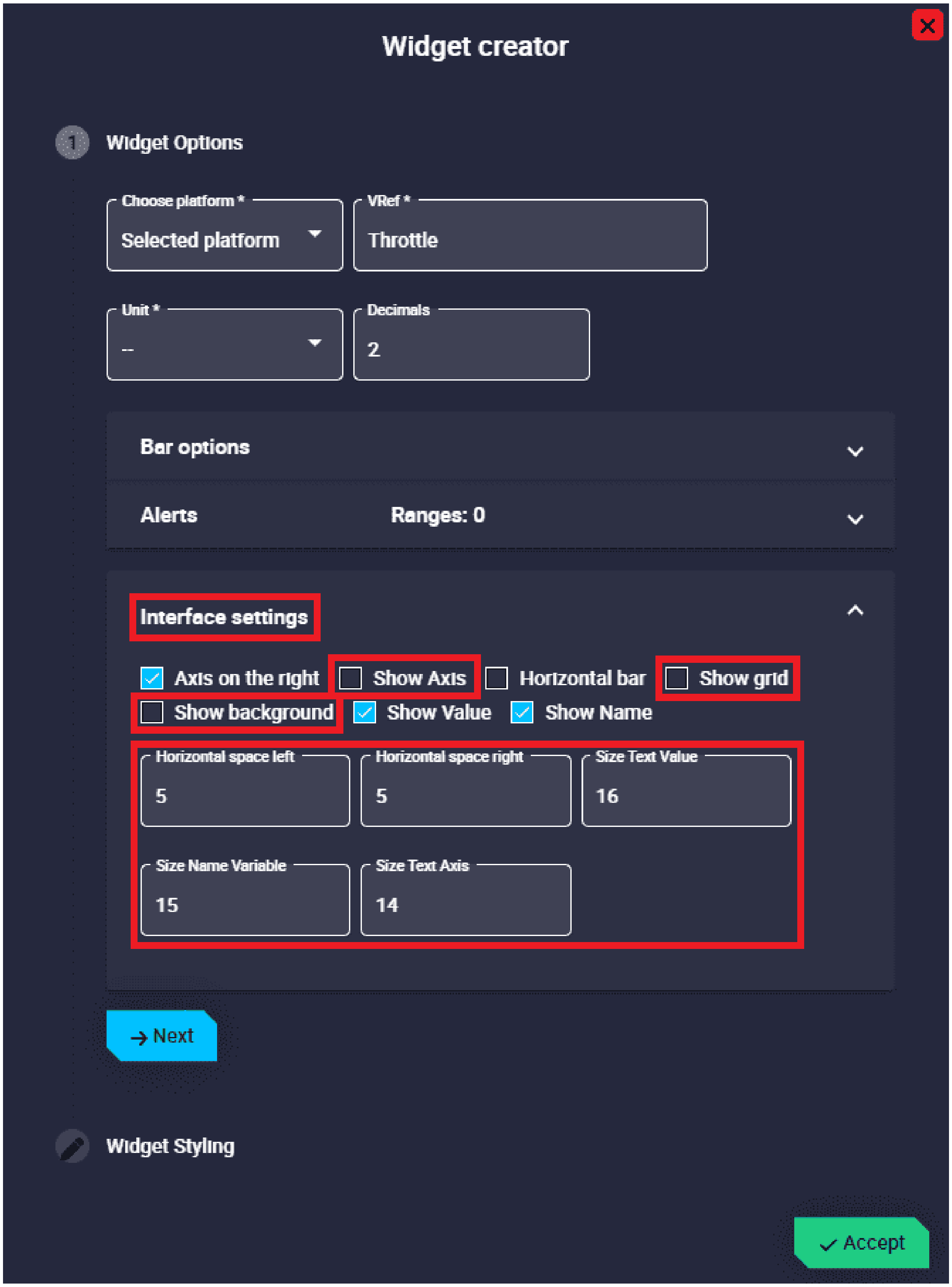
Max *: 1

Ranges: 0

Fig. 296: **Bar configuration - Bar options example 2**

As shown in the figure above, when the background bar is hidden (‘Show background’ option is disabled), the ‘**Background color**’ parameter does not appear.

In addition, as there is no range specified, the color of the bar will always be the one specified in the ‘**Bar color**’ parameter.



Choose platform *: Selected platform

VRef *: Throttle

Unit *: --

Decimals: 2

Bar options

Alerts Ranges: 0

Interface settings

☑ Axis on the right ☐ Show Axis ☐ Horizontal bar ☐ Show grid
☐ Show background ☑ Show Value ☑ Show Name

Horizontal space left: 5

Horizontal space right: 5

Size Text Value: 16

Size Name Variable: 15

Size Text Axis: 14

Fig. 297: **Bar configuration - Reference settings example 2**

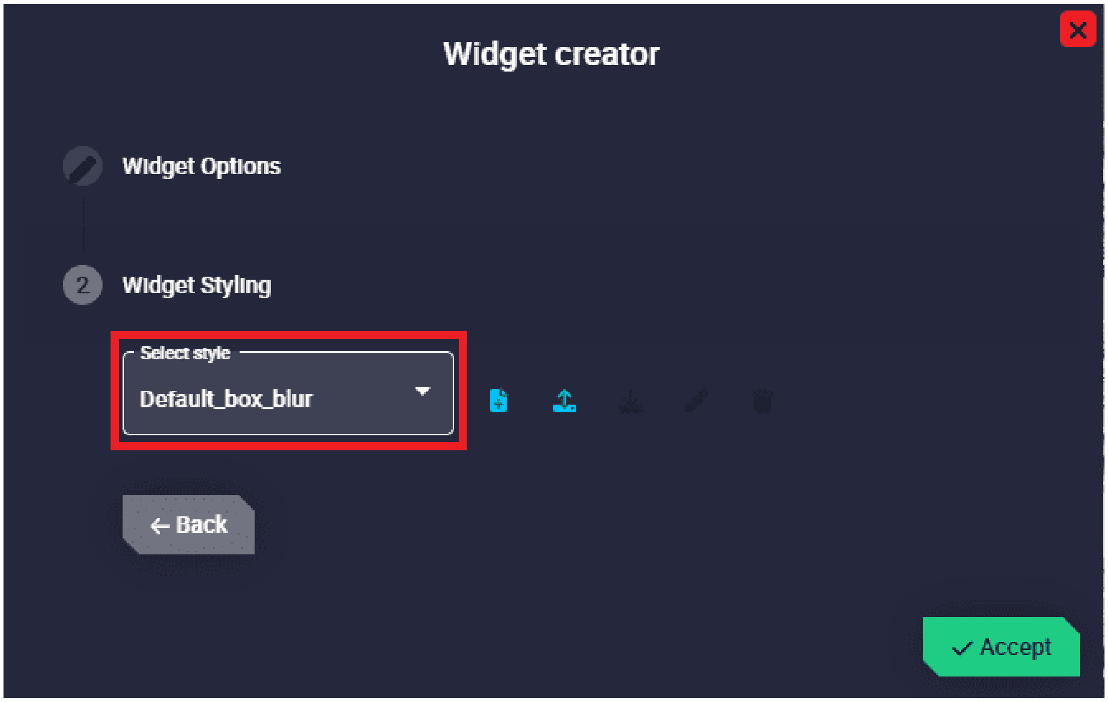


Fig. 298: **Bar configuration - Widget Styling example 2**

Roll Tape

Roll tape widget shows the value of the selected variable with a marker always in the centre position of the widget. It is also possible to add color ranges according to the values of the variable. In addition, a second variable can be used as a reference marker.

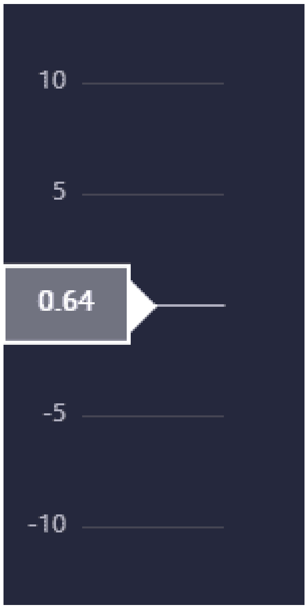


Fig. 299: **Roll Tape**

Right click on the **roll tape** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Roll Tape configuration menu.

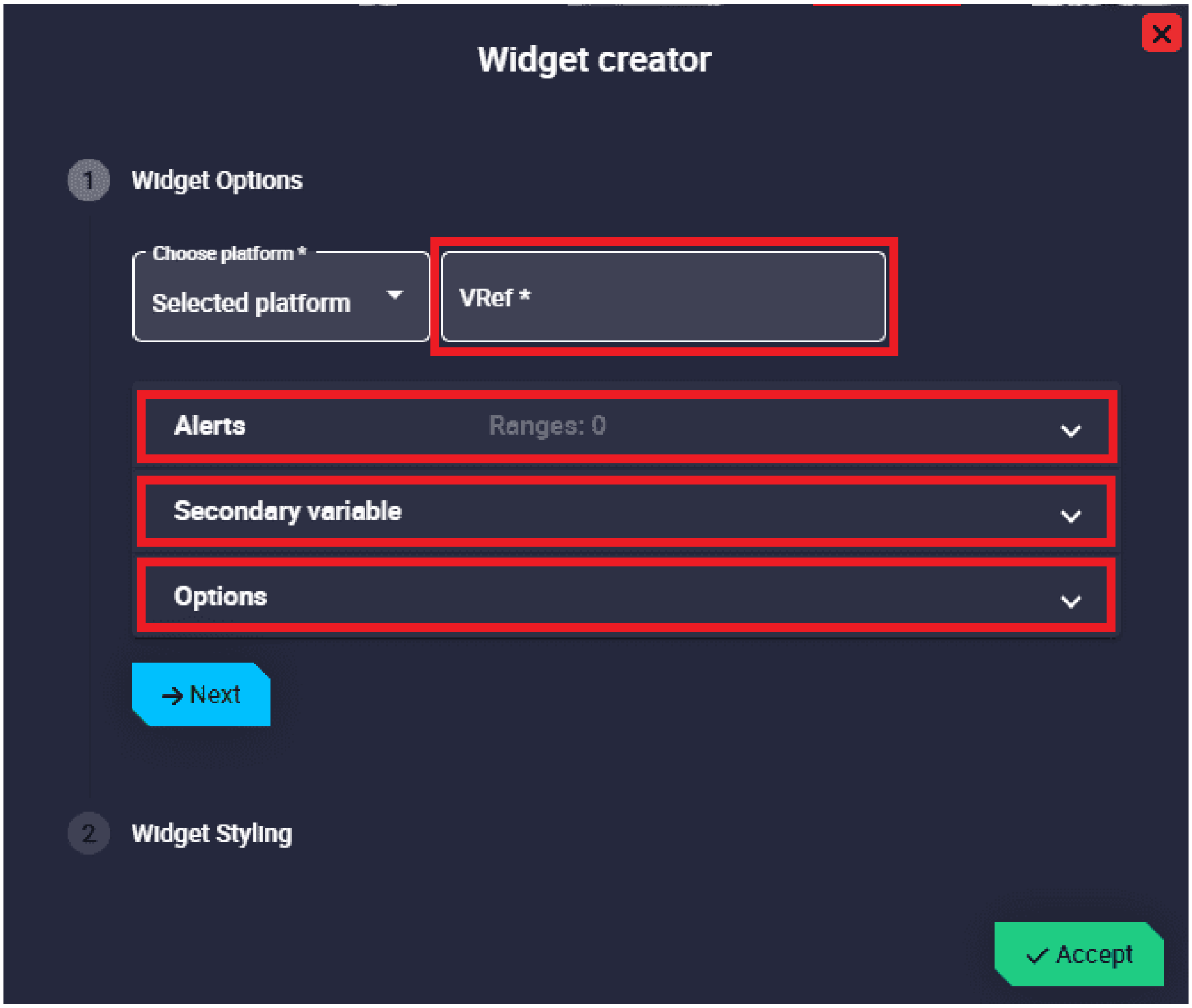
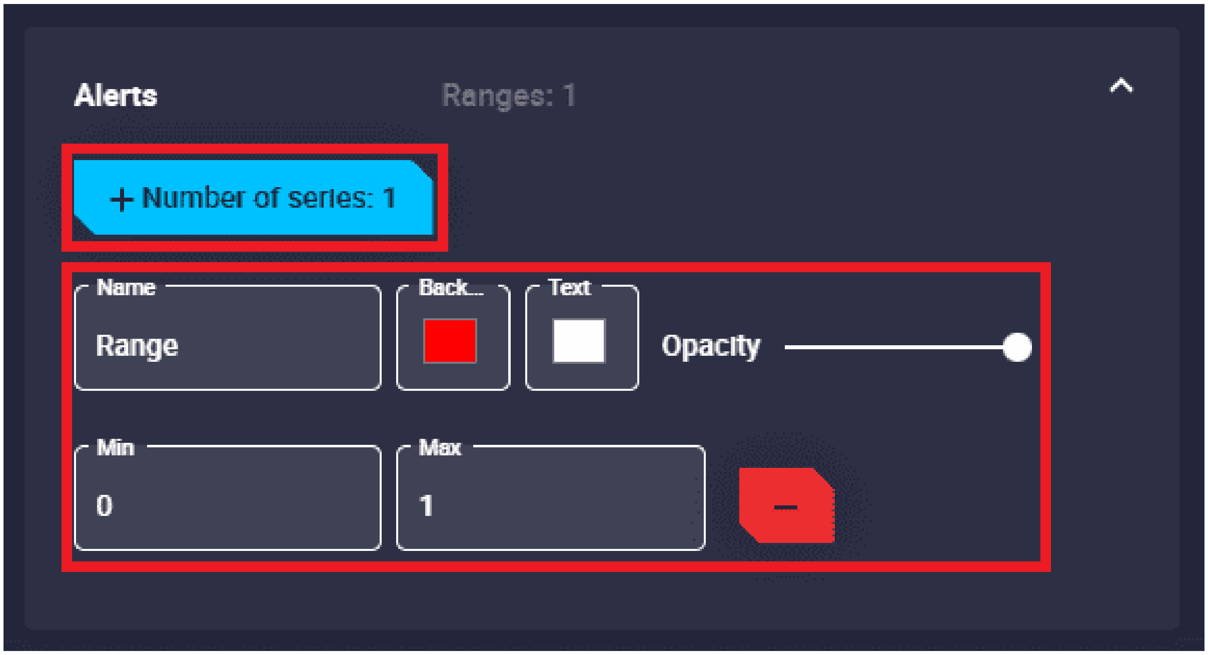


Fig. 300: **Roll Tape configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **VRef**: Users can choose any real, integer or bit variable to be displayed on the roll tape.
  - **Unit and Decimals**: Attention!! **These are only available with Real variables**.
  - **Alerts**: Allows the user to set different ranges. For these ranges several customizations can be made:



Name: Range

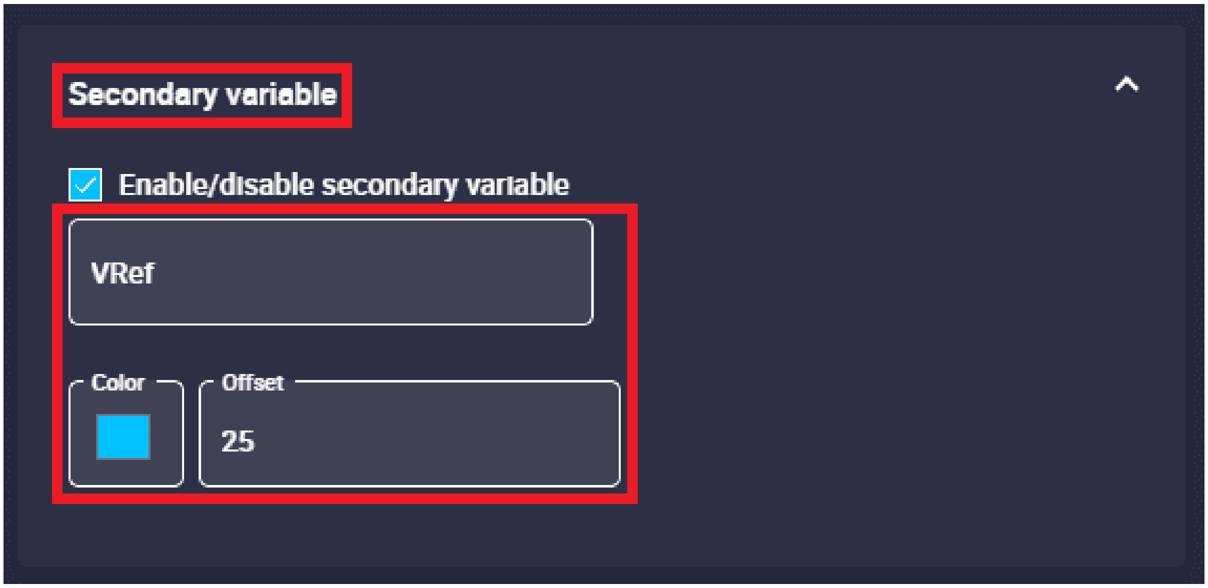
Min: 0

Max: 1

Fig. 301: **Roll Tape configuration - Alerts**

- **Name**: An identifying name can be set for the range.
- **Background color**: Sets the color of the roll tape for this range.
- **Text color**: Sets the color of the range name for this range.
- **Opacity**: The opacity of the roll tape can be customized in this range.
- **Min/Max**: Defines the minimum and maximum values of the range.
- **Remove**: Click to delete this range.

* **Secondary variable**: A second variable can be added to be used, for example, as a reference.



☑ Enable/disable secondary variable

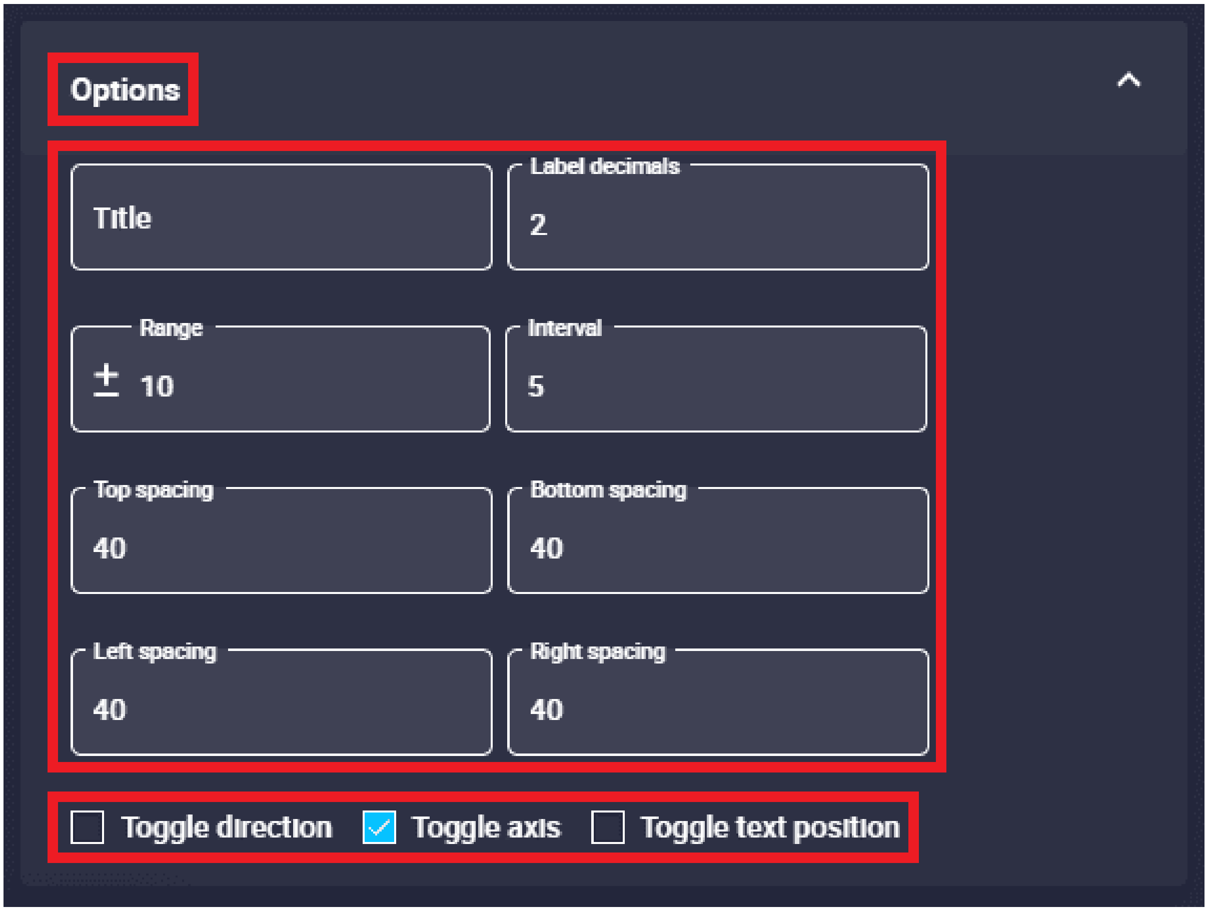
VRef

Color 🟦

Offset 25

Fig. 302: **Roll Tape configuration - Secondary variable**

  - **Enable/disable secondary variable**: If enabled, it is displayed as a marker.
  - **VRef**: Users can choose any real, integer or bit variable to be displayed on the roll tape as a **secondary variable**.
  - **Unit and Decimals**: Attention!! **These are only available with Real variables**.
  - **Color**: Sets the color of the secondary variable marker.
  - **Offset**: Horizontal position of the marker. By default it is set to 25.
- **Options**:



Options

Title

Label decimals: 2

Range: ± 10

Interval: 5

Top spacing: 40

Bottom spacing: 40

Left spacing: 40

Right spacing: 40

☐ Toggle direction ☑ Toggle axis ☐ Toggle text position

Fig. 303: **Roll Tape configuration - Options**

The appearance of the roll tape widget can be customized using the following parameters:

- **Title**: Title of the roll tape widget
- **Label decimals**: Decimals of the value to be displayed on the roll tape. By default it is set to 2.
- **Range (+/-)**: Space between the center and the top and bottom boundaries. The default value is 10.
- **Interval**: Axis interval. Default is 5.
- **Top/Bottom spacing**: The top/bottom spacing of the roll tape widget background can be customized. The default value is 40.
- **Left/Right spacing**: The left/right horizontal spacing of the roll tape widget background can be customized. The default value is 40.
- **Toggle direction**: If enabled, the roll tape and the axis are displayed in horizontal format, otherwise it is in vertical position. By default disabled (in vertical position).
- **Toggle axis**: If enabled, the axis is positioned to the left of the roll tape, otherwise to the right. By default it is enabled.
- **Toggle text position**: If enabled, the previously defined title is positioned at the top of the widget, otherwise it is positioned at the bottom. By default disabled.

An example is given below:

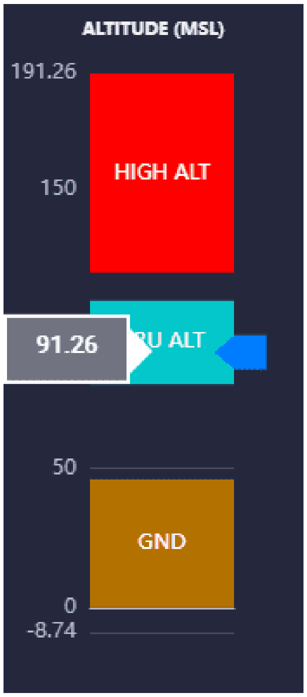
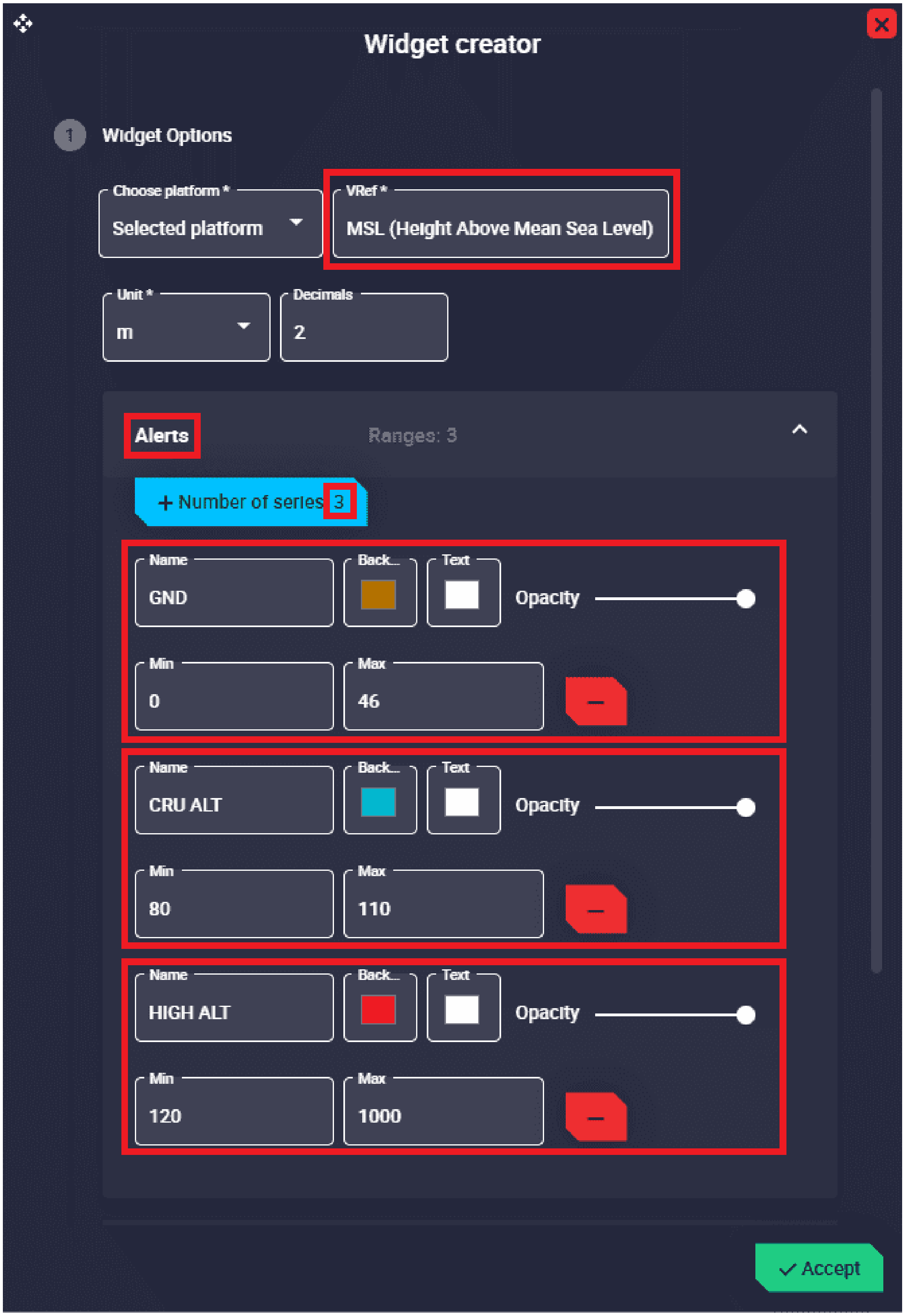


Fig. 304: **Roll Tape example**

The custom configuration made for this roll tape is as follows:



Widget creator

1 Widget Options

Choose platform *: Selected platform

VRef *: MSL (Height Above Mean Sea Level)

Unit *: m

Decimals: 2

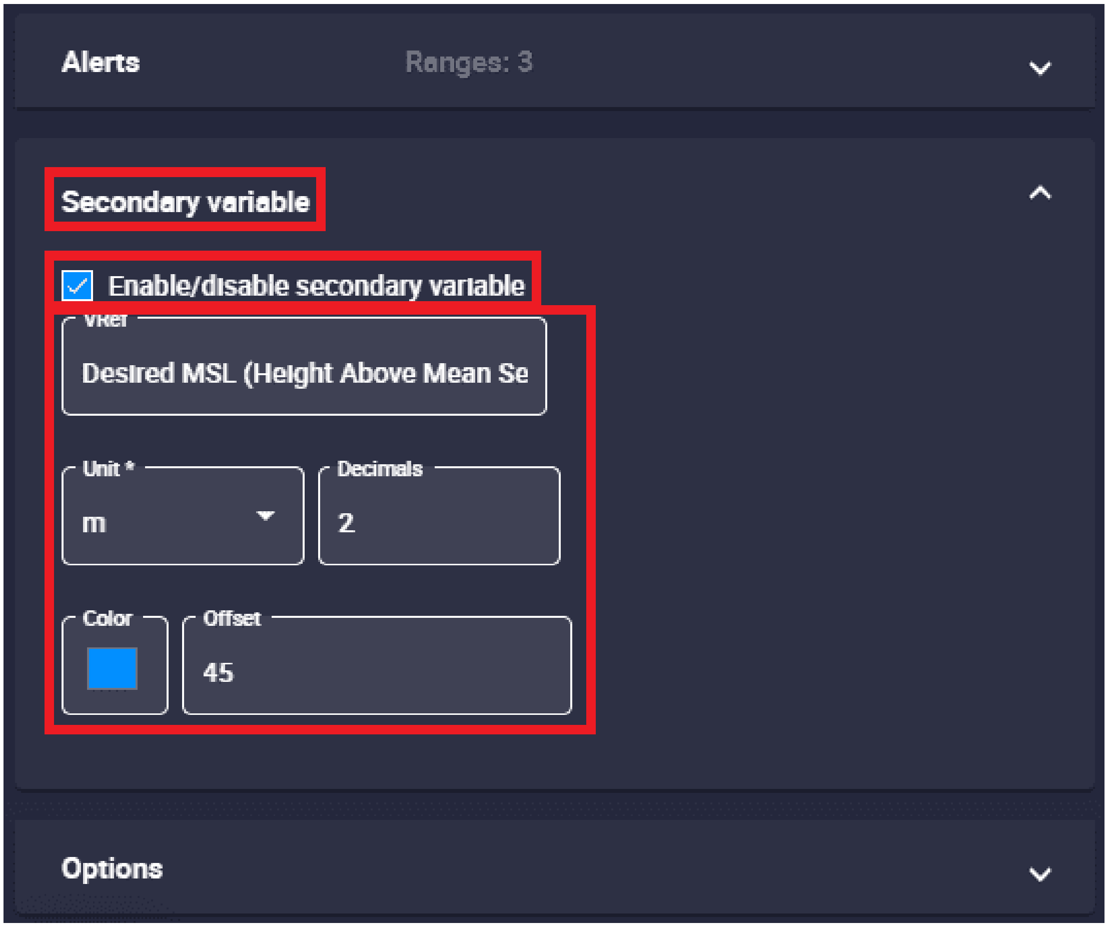
Alerts

Ranges: 3

+ Number of series 3

Name	Back...	Text	Opacity	Min	Max
GND	🟫	⬜	●	0	46
CRU ALT	🟦	⬜	●	80	110
HIGH ALT	🟥	⬜	●	120	1000

Fig. 305: **Roll Tape configuration - Alerts example**



☑ Enable/disable secondary variable

VRef: Desired MSL (Height Above Mean Se

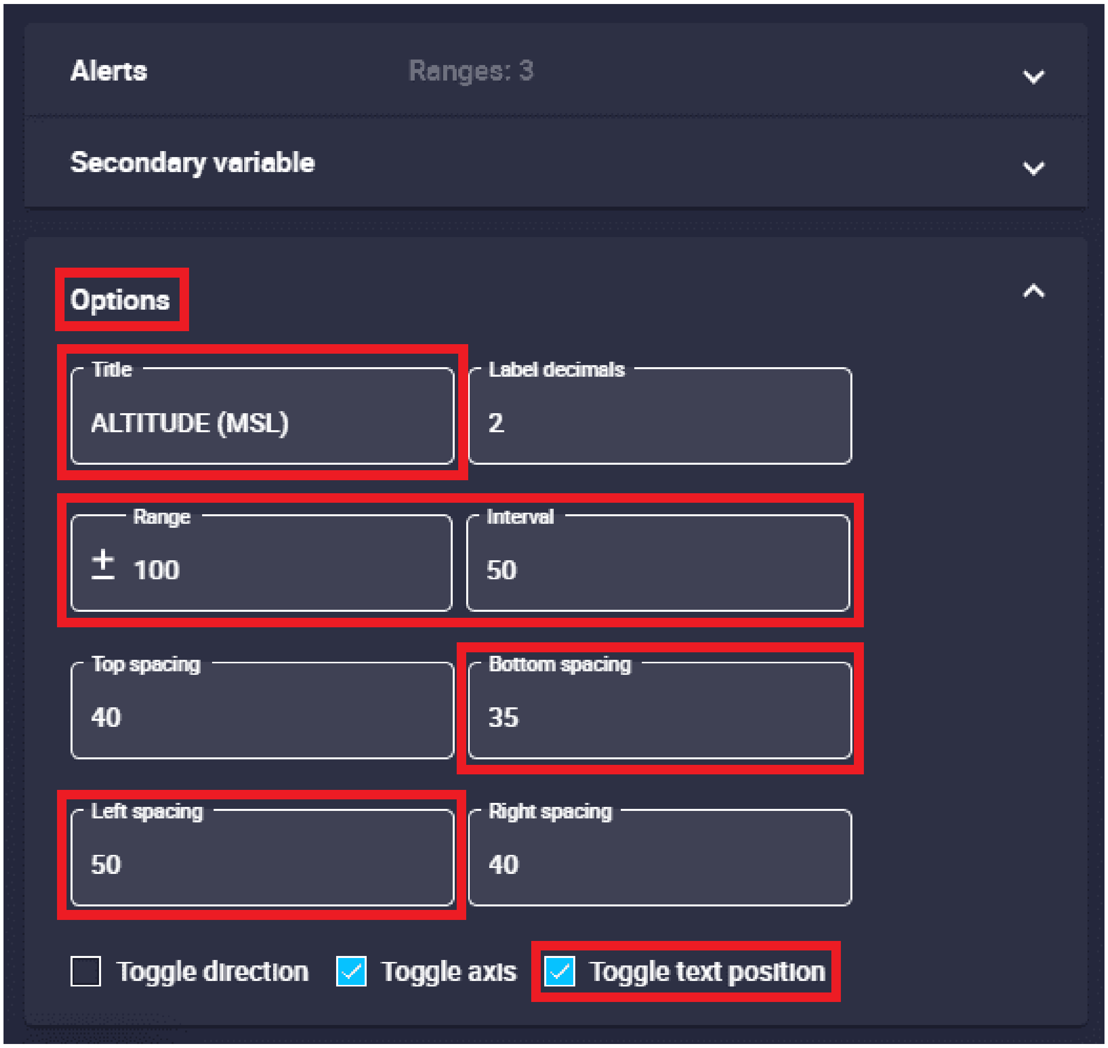
Unit *: m

Decimals: 2

Color: 🟦

Offset: 45

Fig. 306: **Roll Tape configuration - Secondary variable example**


Alerts Ranges: 3

Secondary variable

Options

Title: ALTITUDE (MSL)

Label decimals: 2

Range: ± 100

Interval: 50

Top spacing: 40

Bottom spacing: 35

Left spacing: 50

Right spacing: 40

☐ Toggle direction ☑ Toggle axis ☑ Toggle text position

Fig. 307: **Roll Tape configuration - Options example**

3.5.2.2.4 Statics

Statics widgets **do not depend on the selected platform**, therefore the '*Choose platform*' parameter will not appear in any of the widgets described below.

Text

Text widget allows the user to insert text labels in the workspace.

Fig. 308: **Text**

Right click on the **text** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Text configuration menu.
    - **Widget Options**:

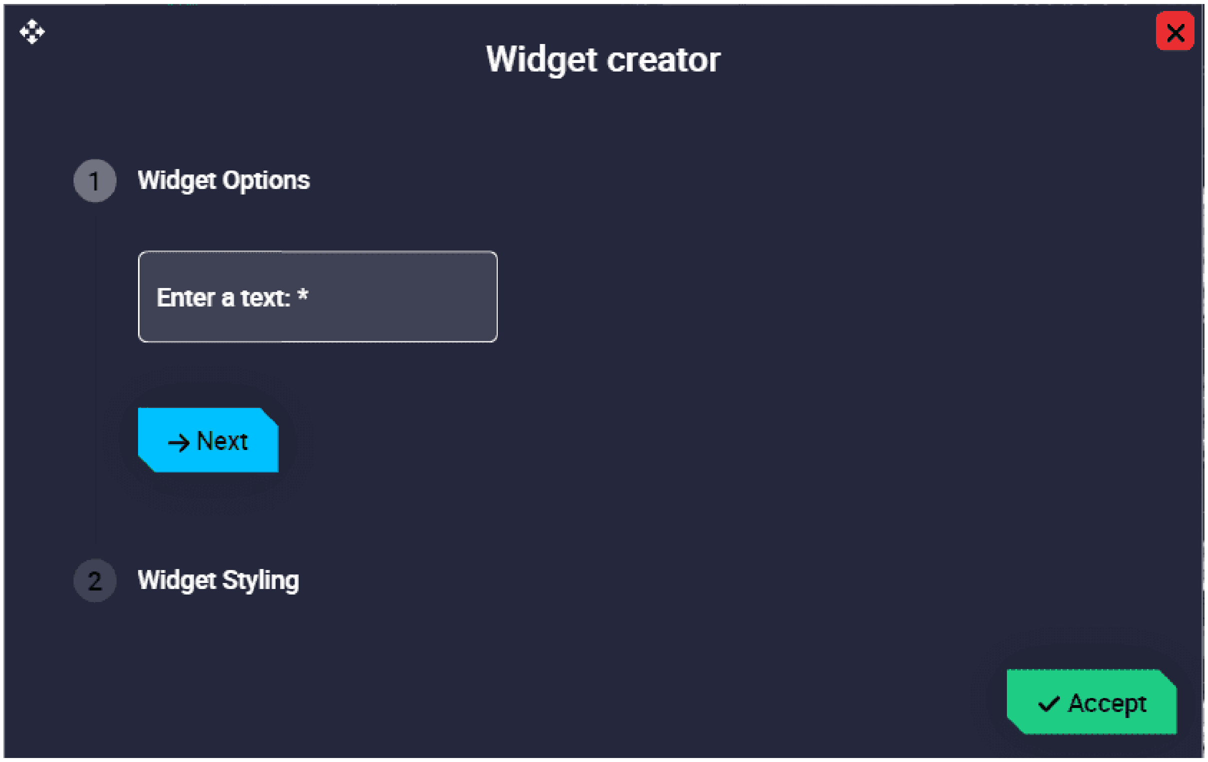


Fig. 309: **Text configuration**

        - **Enter a text**: Enter the desired text to be displayed as a label.
    - **Widget Styling**: This widget has the 'basic' *Widget Styling* configuration described in the *Widget common configuration*.

Image

Image widget allows the user to insert an image in the workspace.

Note: A gif can also be added with this widget.

Fig. 310: **Image**

Right click on the **image** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Image configuration menu.
  - **Widget Options**:

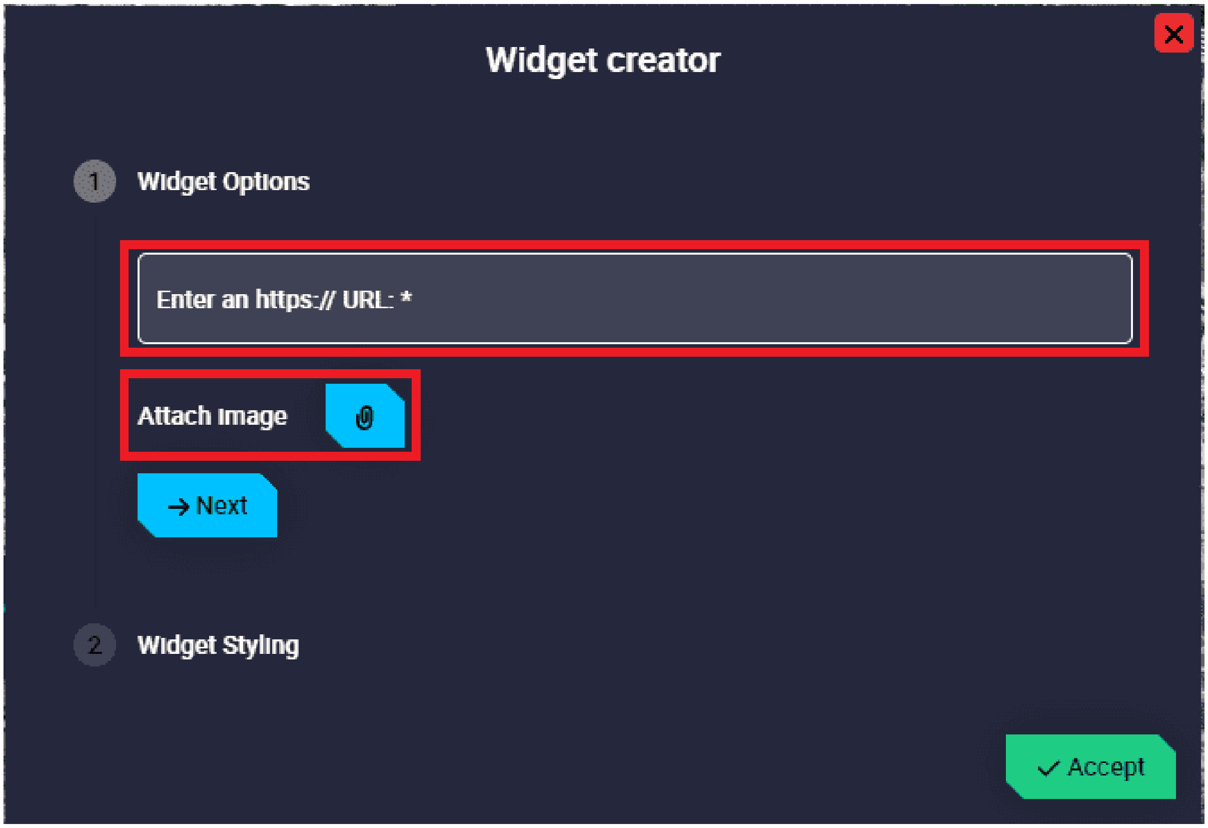


Fig. 311: **Image configuration**

    - **Enter an https:// URL:** Users can enter the URL of the image to be displayed.
    - **Attach Image**: It is possible to import an image from PC.
  - **Widget Styling**: This widget has the 'basic' *Widget Styling* configuration described in the *Widget common configuration*.

An example is given below:

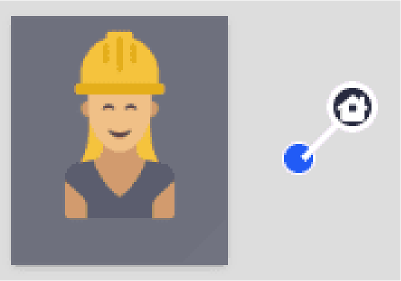
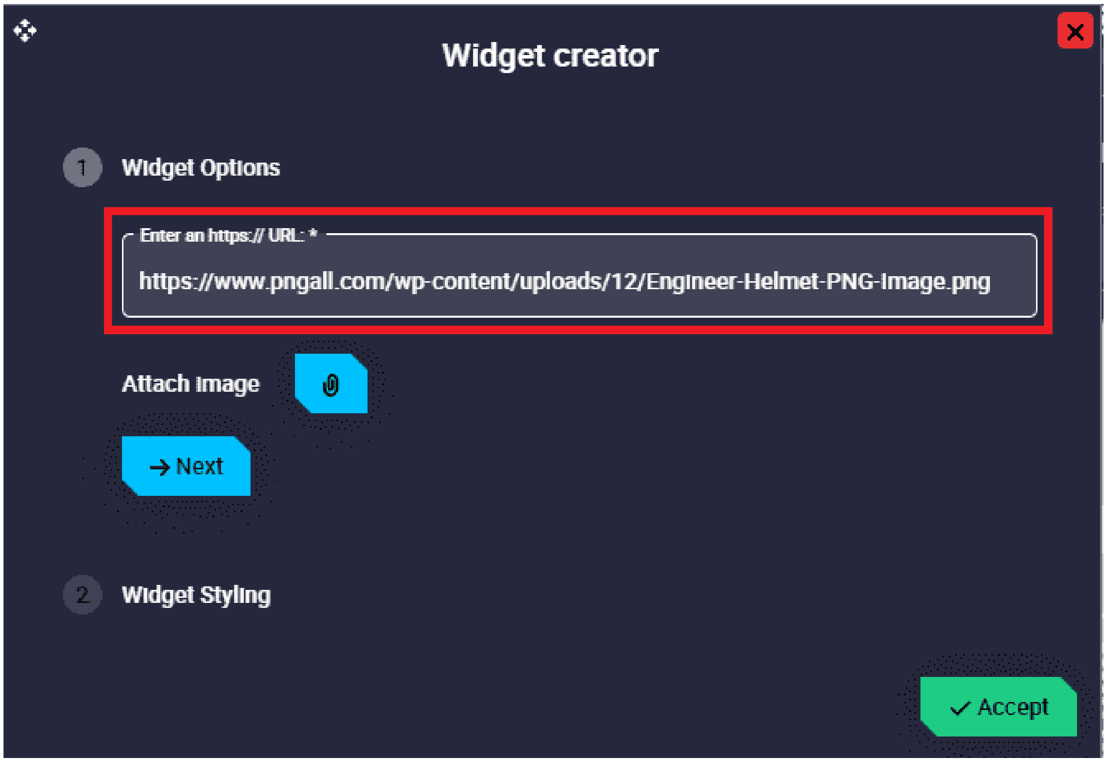


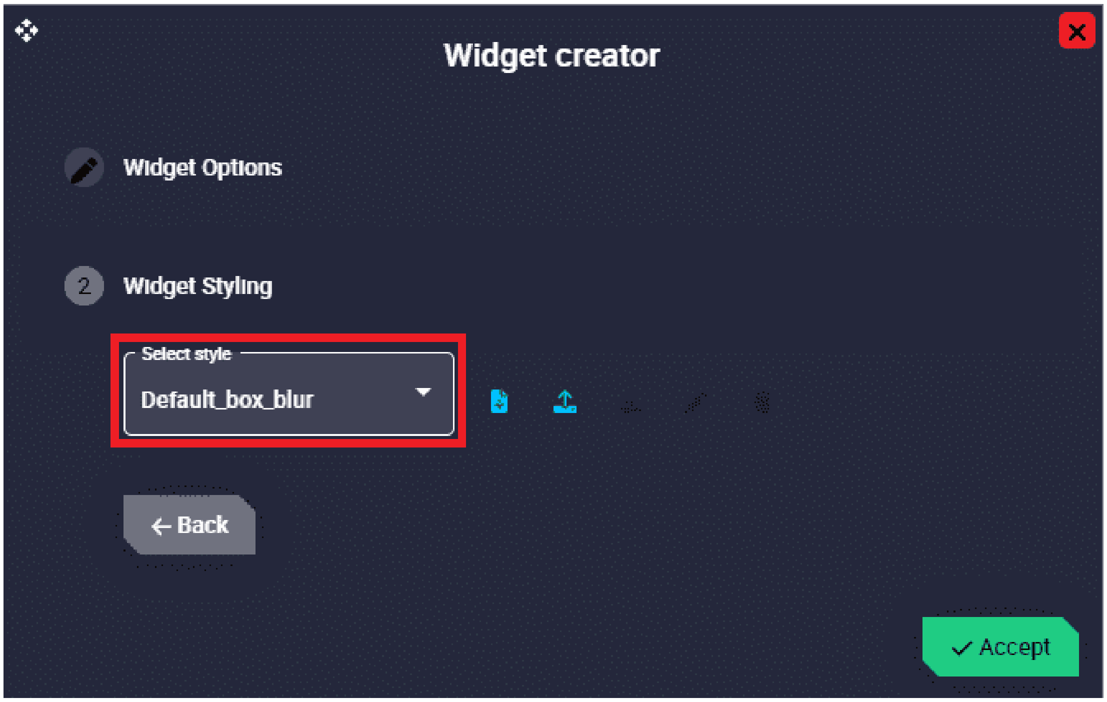
Fig. 312: **Image example**

As can be seen in the figure below, this image has been imported from the browse.



Enter an https:// URL: *
https://www.pngall.com/wp-content/uploads/12/Engineer-Helmet-PNG-Image.png

Fig. 313: **Image configuration - Widget Options example**



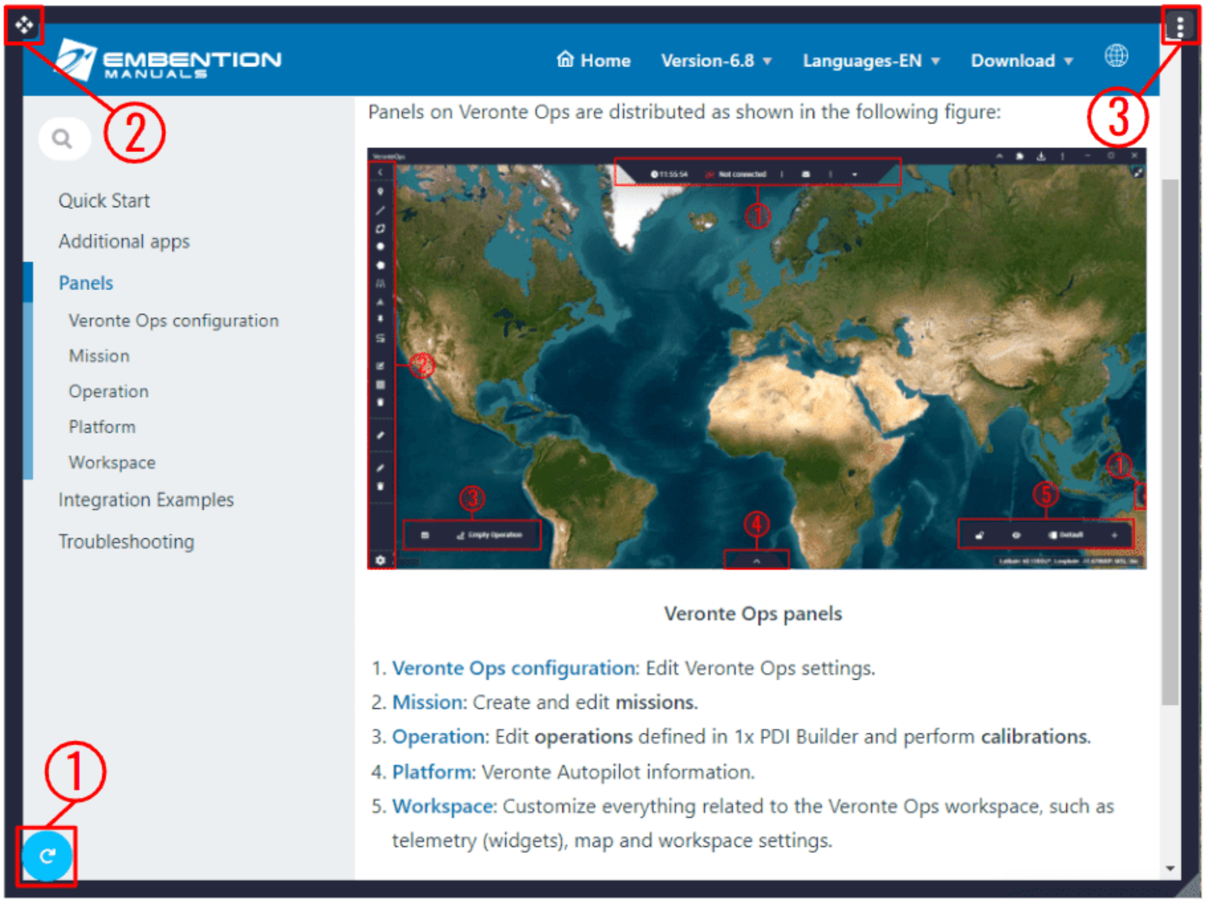
Select style
Default_box_blur

Fig. 314: **Image configuration - Widget Styling example**

Iframe

Iframe widget allows the user to embed a **web page** as a widget in the workspace.

For example, useful websites could be: the windy website, the veronte operations manuals, the web application of the external radio if it is being used for operation, etc.



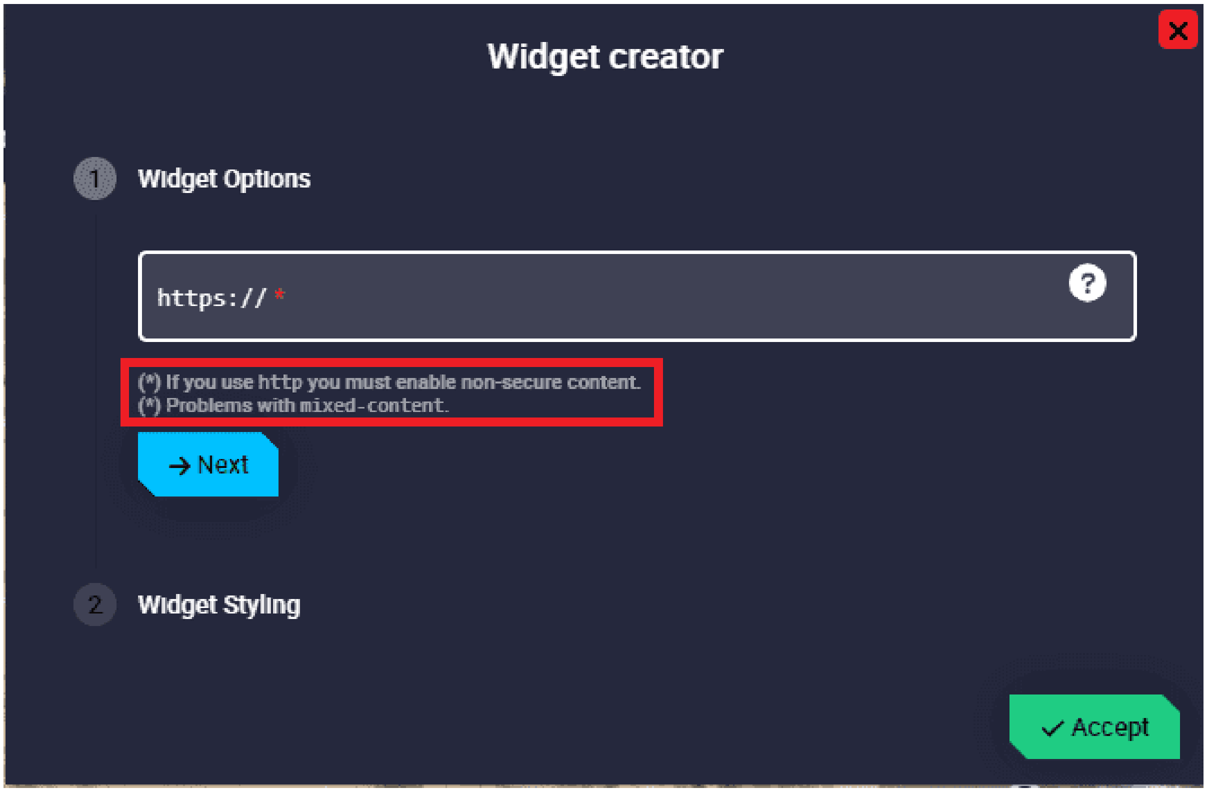
Panels on Veronte Ops are distributed as shown in the following figure:

Veronte Ops panels

1. Veronte Ops configuration: Edit Veronte Ops settings.
2. Mission: Create and edit **missions**.
3. Operation: Edit **operations** defined in 1x PDI Builder and perform **calibrations**.
4. Platform: Veronte Autopilot information.
5. Workspace: Customize everything related to the Veronte Ops workspace, such as telemetry (widgets), map and workspace settings.

Fig. 315: **Iframe**

1. **Reload page**: Refreshes the web page embedded as a widget.
2. **Move**: Allows the user to move the widget to the desired position in the workspace.
3. **Options**:
    - **Duplicate**: Duplicates this widget.
    - **Edit**: This allows the user to access the Iframe configuration menu.
        - **Widget Options**:



(*) If you use `http` you must enable non-secure content.
(*) Problems with `mixed-content`.

Fig. 316: **Iframe configuration**

      - **https:// :** Users can enter the URL of the web page to be displayed.

        In order to be able to view the video recording from a gimbal and also tracking directly with the image, users must copy here the URL generated by the *Web Converter*, which converts from **RTSP** to **WebRTC**.

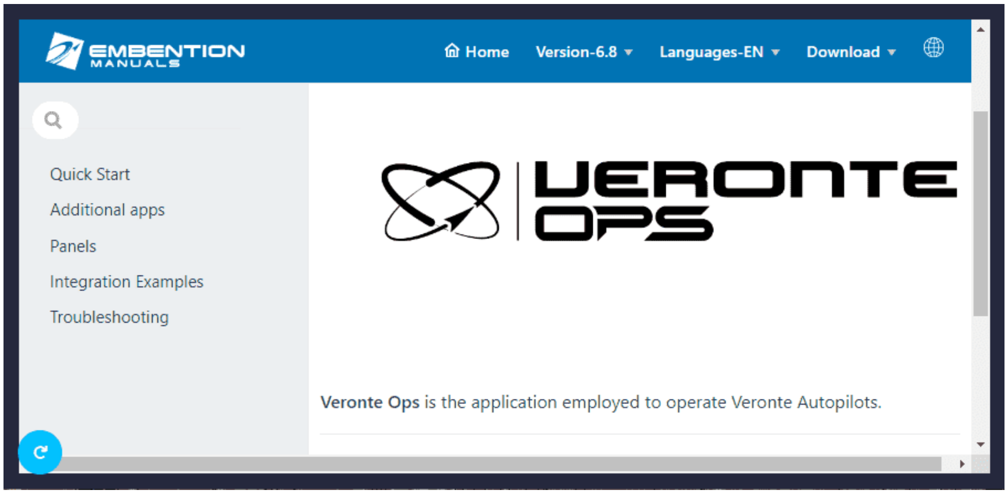
        Warning: Pay attention to the notes in the widget!!

    - **Widget Styling**: This widget has the 'basic' *Widget Styling* configuration described in the *Widget common configuration*.

  - **Remove**: Deletes this widget.

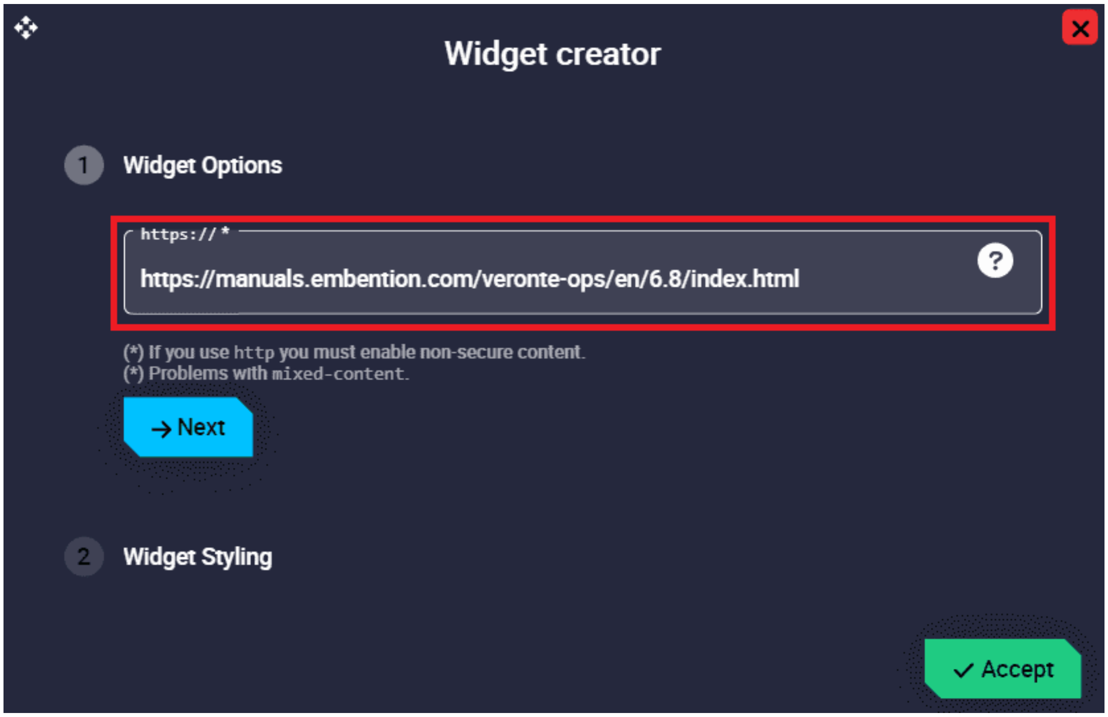
Some examples example are given below:

- **Example 1**:



Veronte Ops is the application employed to operate Veronte Autopilots.

Fig. 317: **Iframe example 1**



https://*: https://manuals.embention.com/veronte-ops/en/6.8/index.html

(*) If you use `http` you must enable non-secure content.
(*) Problems with `mixed-content`.

Fig. 318: **Iframe configuration example 1**

- **Example 2**:

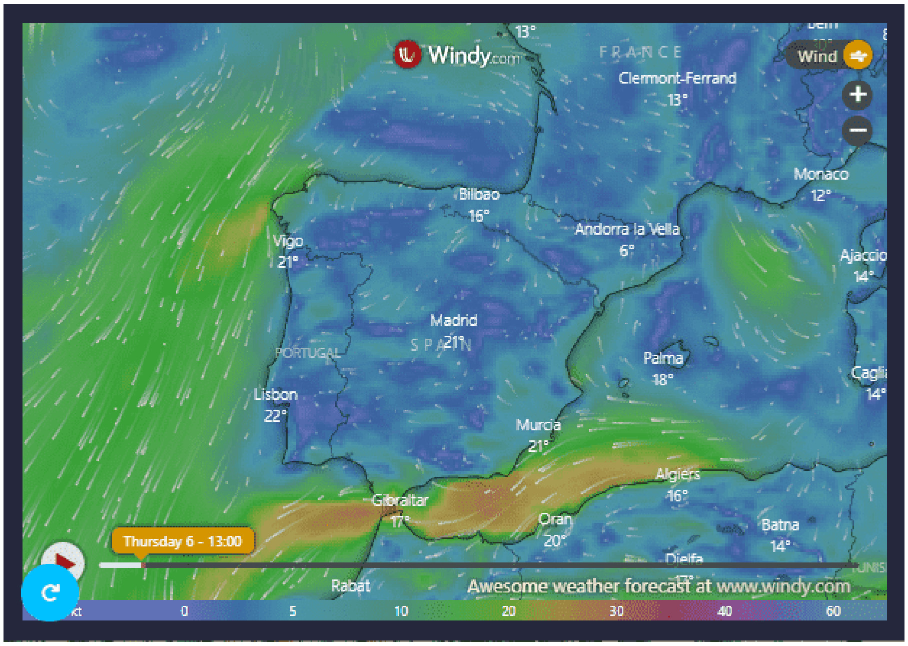
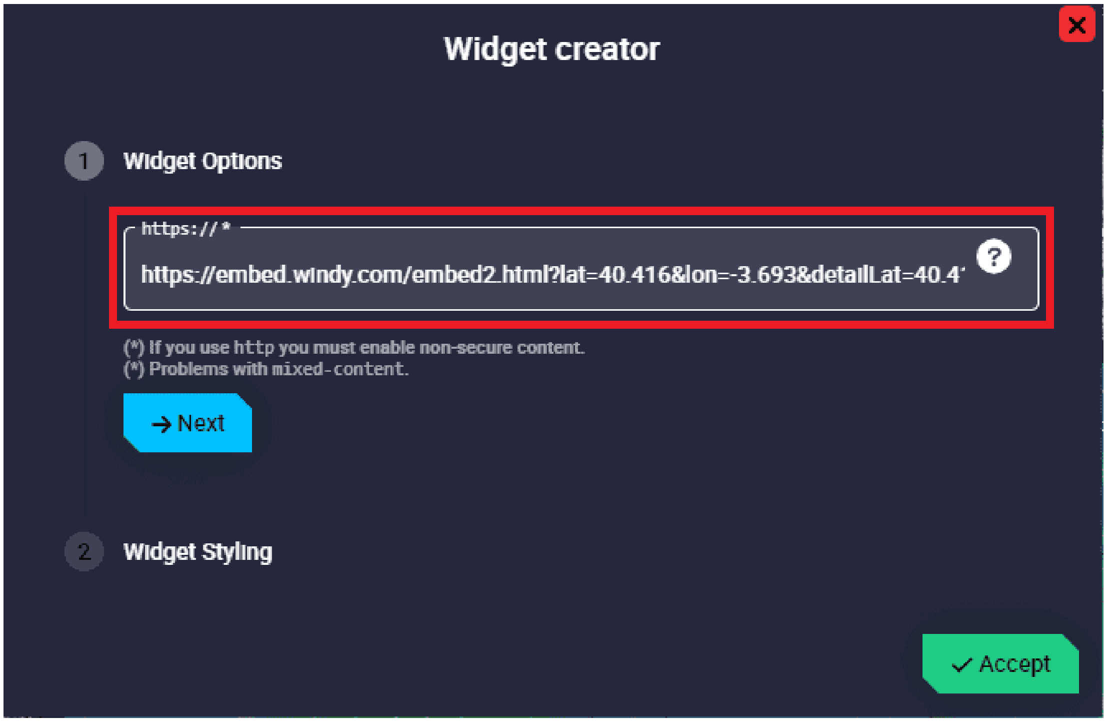


Fig. 319: **Iframe example 2**



https://embed.windy.com/embed2.html?lat=40.416&lon=-3.693&detailLat=40.4

(*) If you use `http` you must enable non-secure content.
(*) Problems with `mixed-content`.

Fig. 320: **Iframe configuration example 2**

Video

Video widget allows the user to insert a video in the workspace.

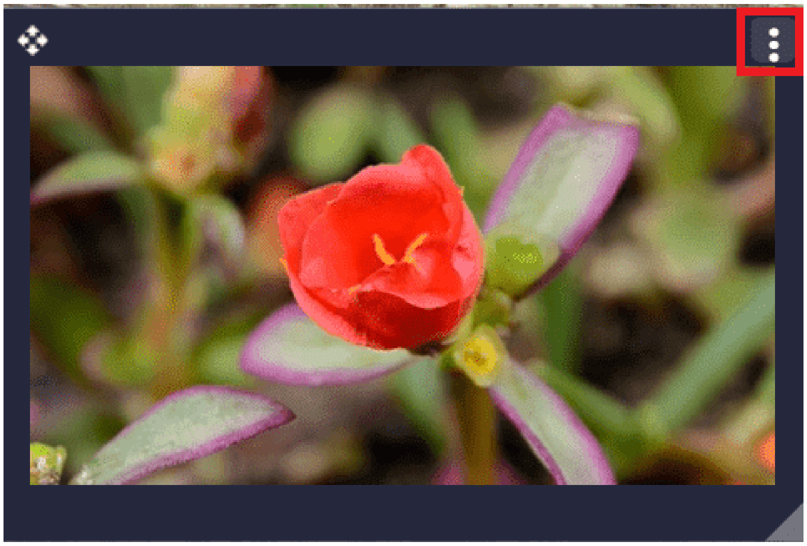
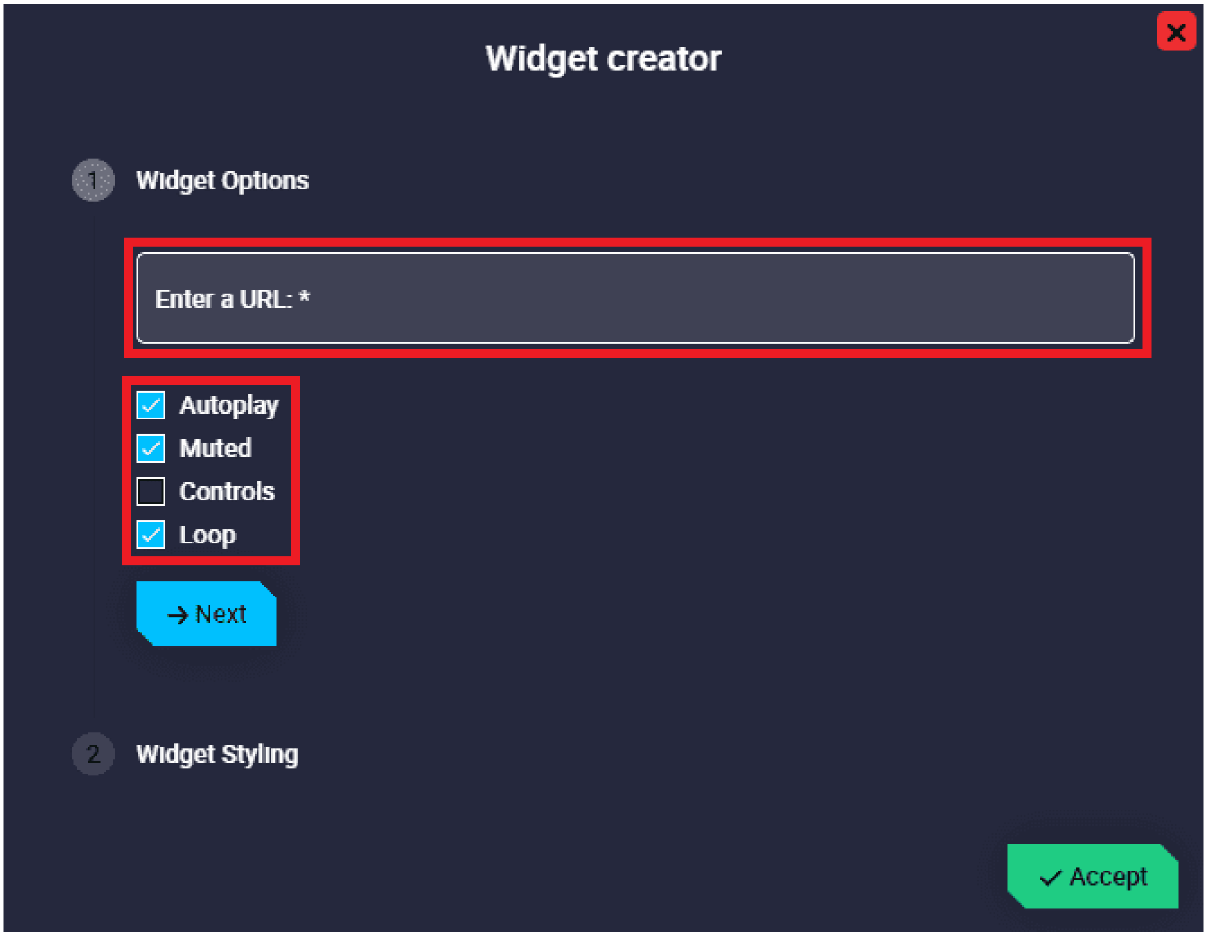


Fig. 321: **Video**

Click the ⋮ button to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Video configuration menu.
    - **Widget Options**:



☑ Autoplay
☑ Muted
☐ Controls
☑ Loop

Fig. 322: **Video configuration**

        - **Enter a URL:** Users can enter the URL of the video to be displayed.

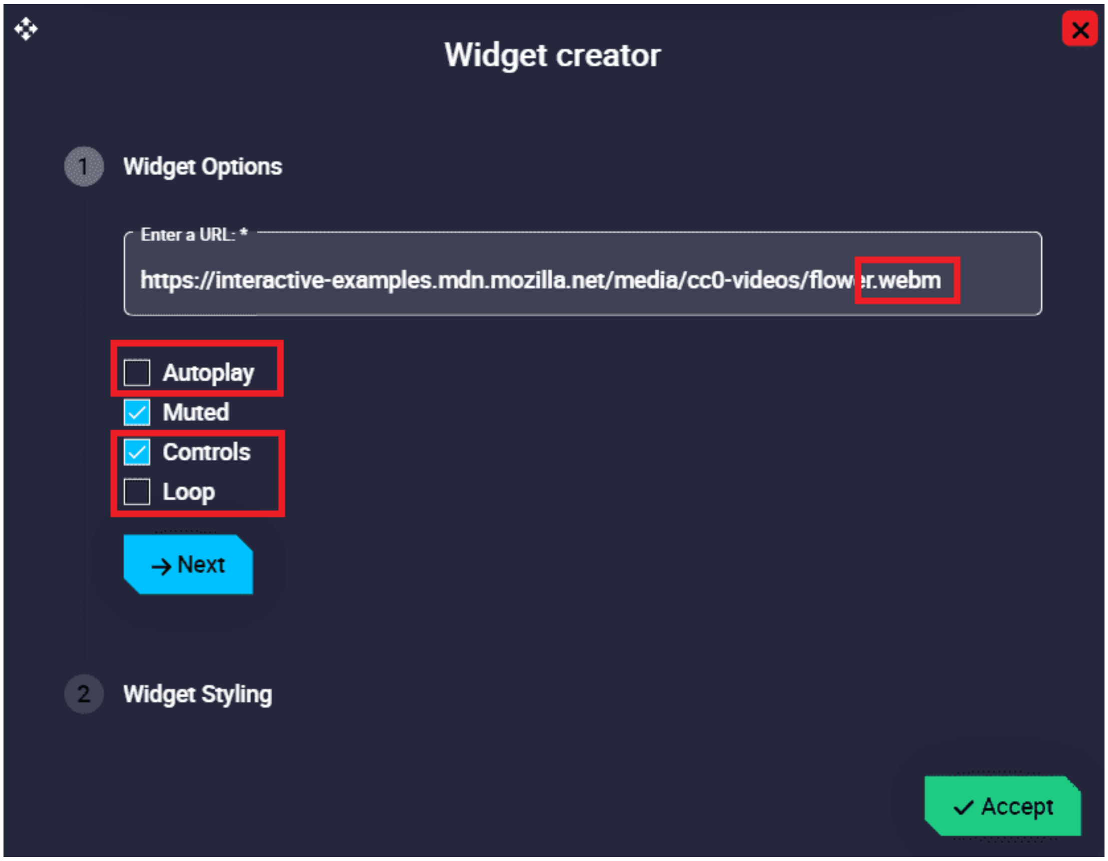
          Caution: The video must be in `.mpa4` , `.ogg`, `.webm` or `.avi` format.

        - **Autoplay**: The video plays automatically when the user enters its URL. By default it is enabled.
        - **Muted**: The video can be muted/unmuted. By default it is enabled.
        - **Controls**: Video controls can be added to the widget. Controls such as* play/pause*, *mute/unmute*, *full screen*, etc. By default it is disabled.
        - **Loop**: Video plays continuously, like a gif. By default it is enabled.

    - **Widget Styling**: This widget has the 'basic' *Widget Styling* configuration described in the *Widget common configuration*.

An example is given below:

Fig. 323: **Video example**



Enter a URL: * https://interactive-examples.mdn.mozilla.net/media/cc0-videos/flower.webm

☐ Autoplay
☑ Muted
☑ Controls
☐ Loop

Fig. 324: **Video configuration example**

3.5.2.2.5 Inputs

Veronte Ops allows the user to modify some variables during a flight to test some parameters or to simulate a stick control.

Slider

Slider widgets allow the user to choose a certain variable and change its value by simply moving the slider to the desired value from the workspace during a flight.

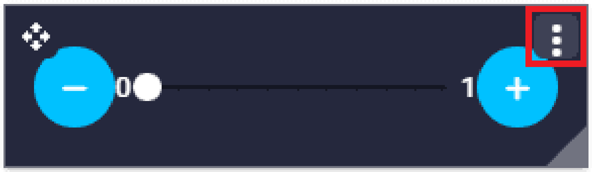


Fig. 325: **Slider**

Click the ⋮ button to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Slider configuration menu.

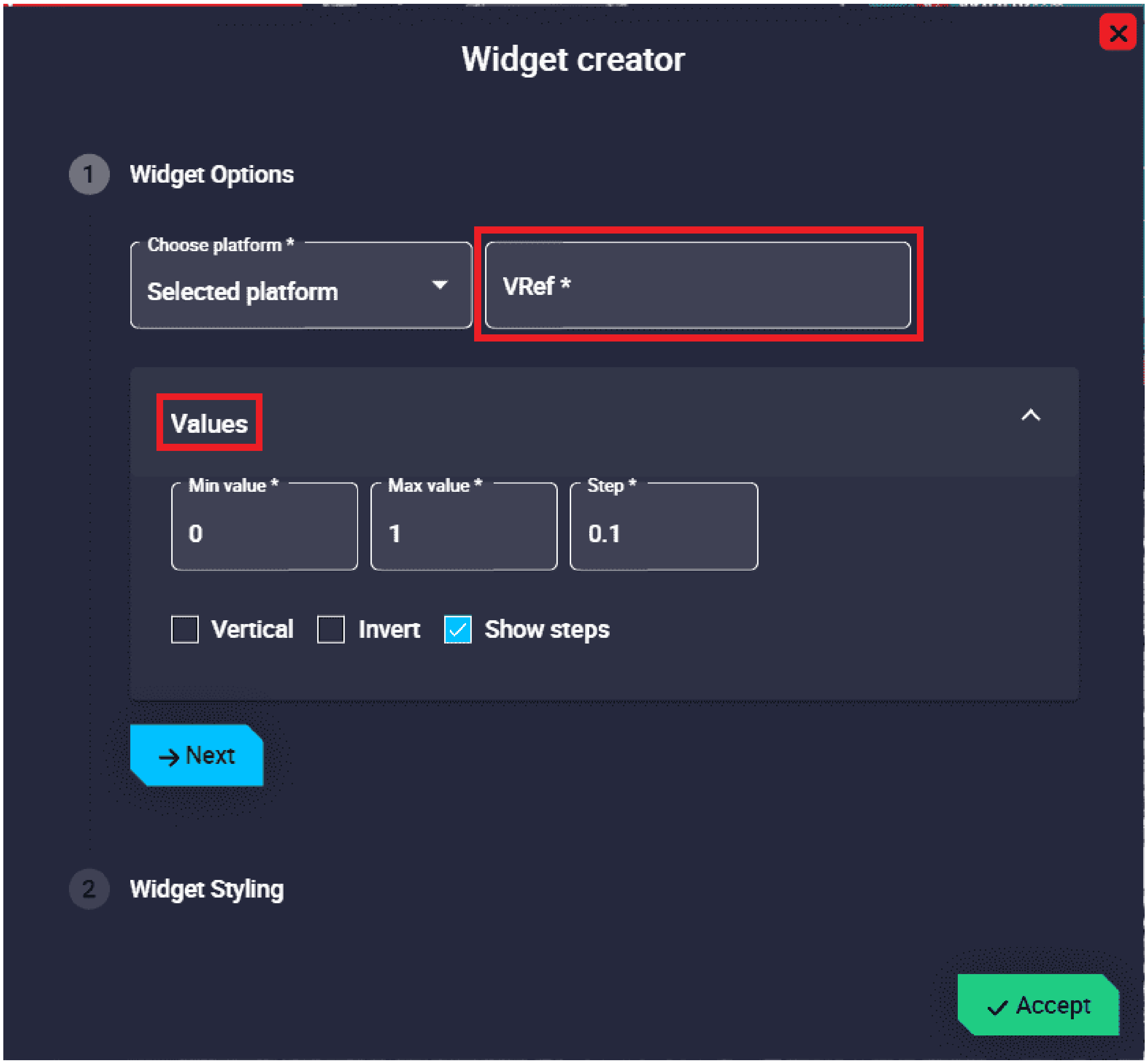


Fig. 326: **Slider configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **VRef**: Users can choose any real, integer or bit variable to be displayed on the slider.
  - **Unit**: Attention!! **This is only available with Real variables**.
  - **Values**:
    - **Min/Max value**: Minimum and maximum values displayed in the slider. Defaults are 0 and 1 respectively.
    - **Step**: Here users must enter the step they want the slider to have. By default it is set to 0.1.
    - **Vertical**: If enabled, the slider widget is displayed in vertically, otherwise it is displayed horizontally. By default disabled (in horizontal position).

- **Invert**: If enabled, the minimum and maximum values are swapped, otherwise the minimum value is to the left of the widget and the maximum value to the right. By default disabled.
- **Show steps**: If enabled, the step divisions of the slider are shown when interacting with the widget, otherwise they are hidden. By default it is enabled.

An example is given below:

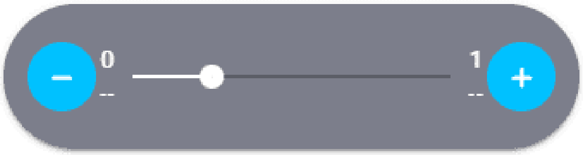
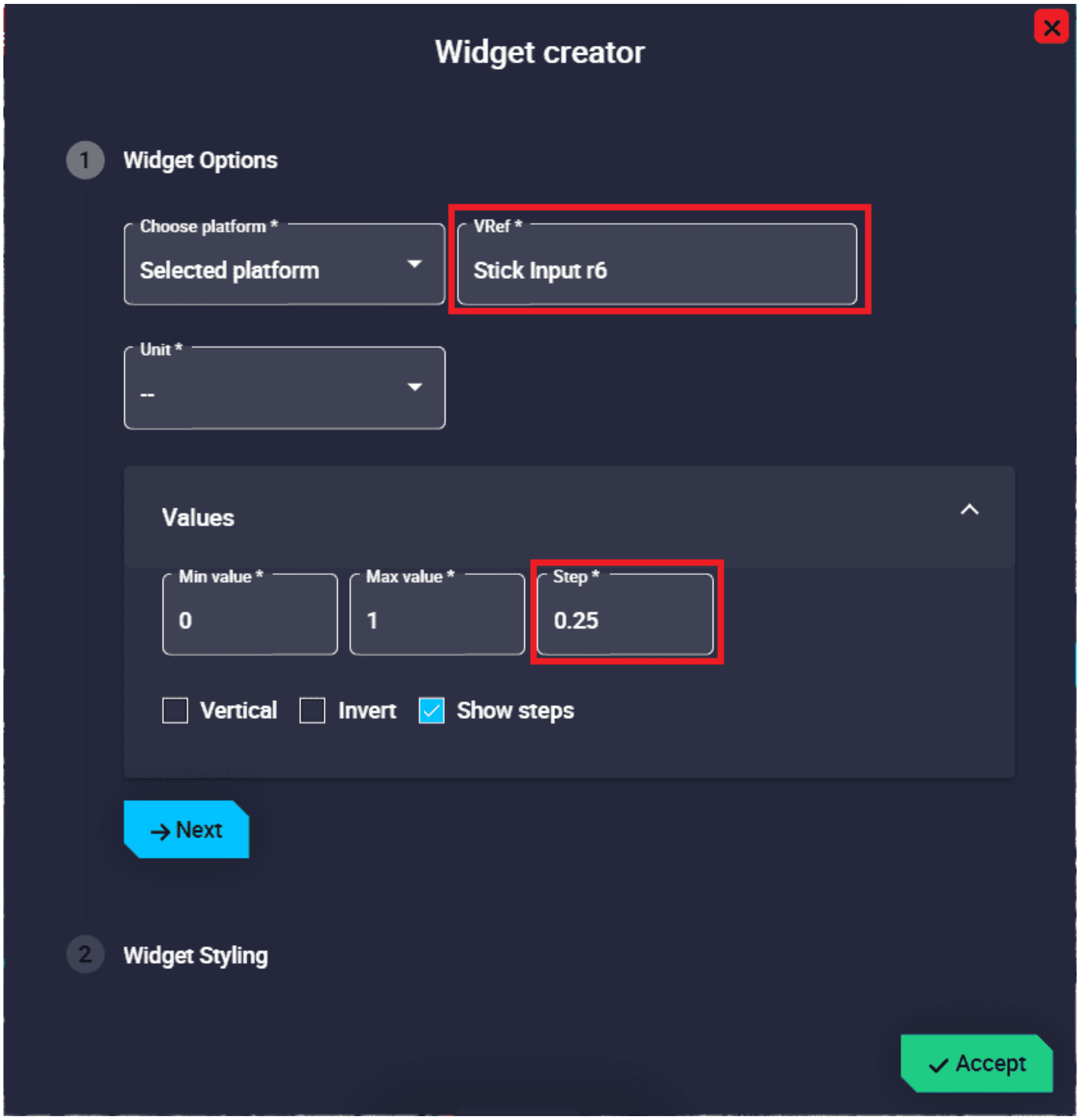


Fig. 327: **Slider example**



Choose platform * : Selected platform

VRef * : Stick Input r6

Unit * : --

Values

Min value * : 0

Max value * : 1

Step * : 0.25

☐ Vertical ☐ Invert ☑ Show steps

Fig. 328: **Slider configuration example**

Action Button

Action Button widgets work exactly like the action buttons embedded in the *Veronte Panel*.

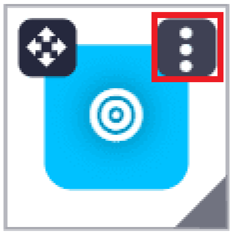


Fig. 329: **Action Button**

Click the ⋮ button to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Action Button configuration menu.

  This widget has only **one extra edit parameter** compared to the ones described in *Widget common configuration*:

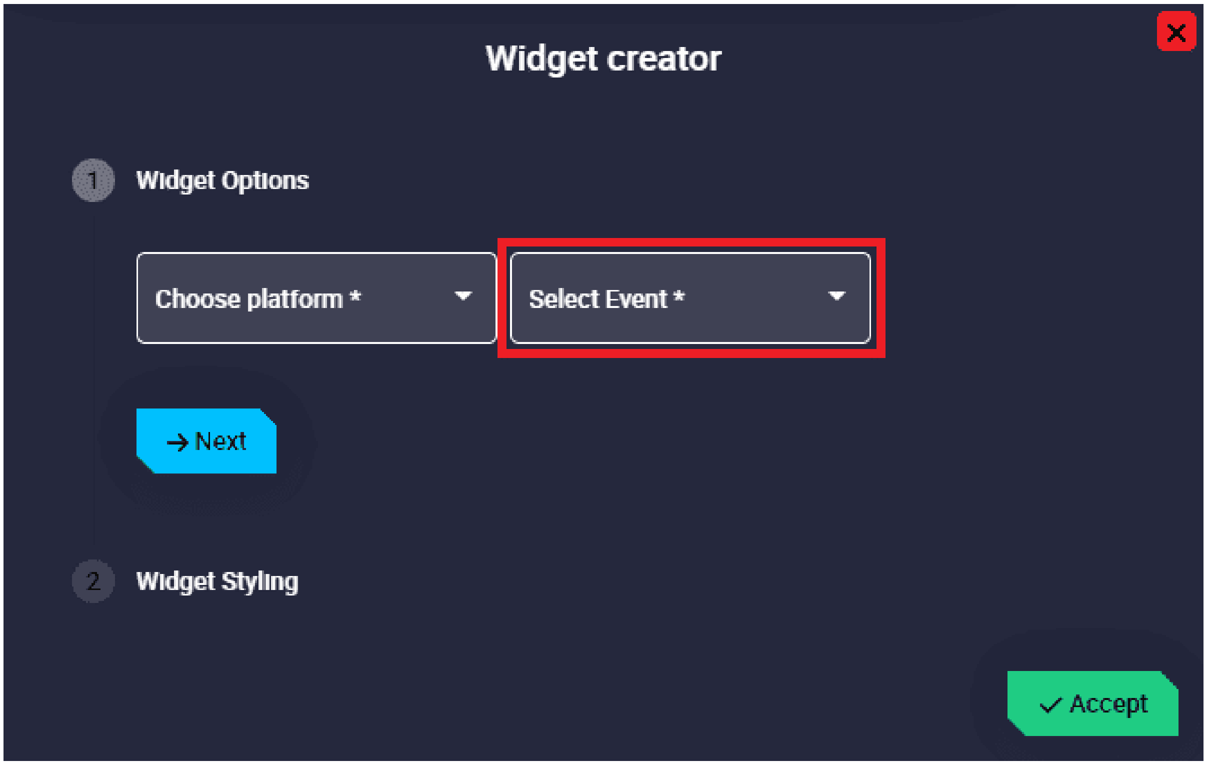
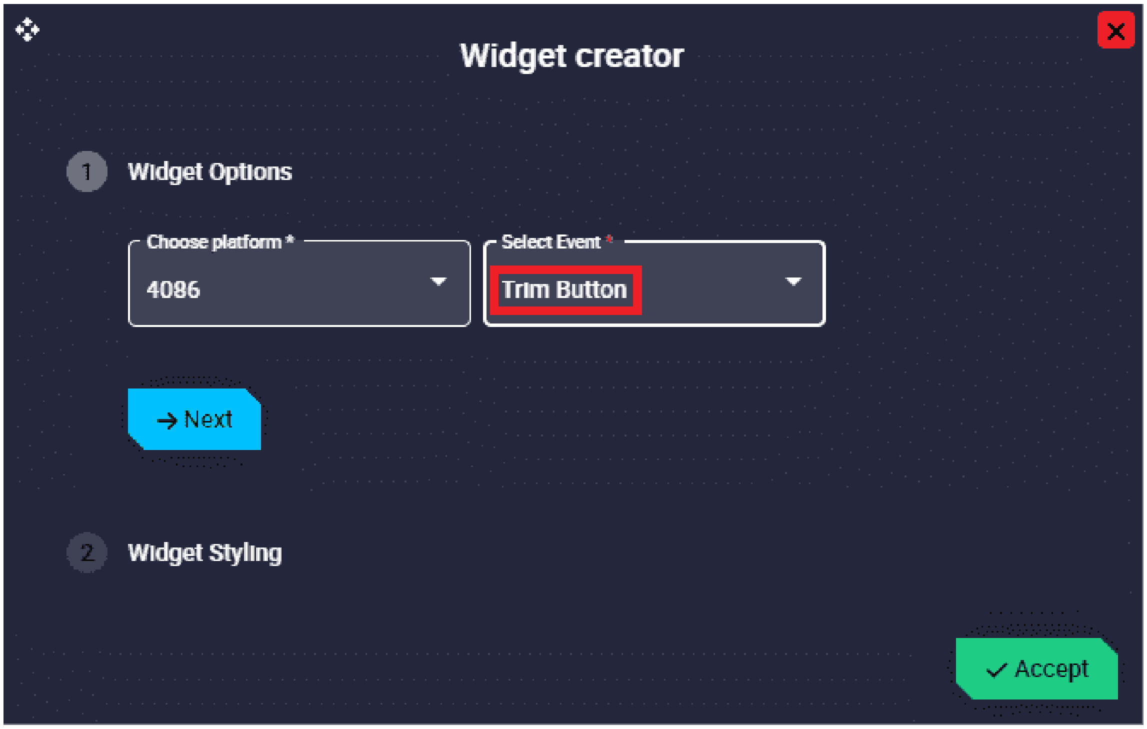


Fig. 330: **Action Button configuration**

  - **Widget Options** → **Select Event**: Select the desired button event to be displayed as an action button. This event must be previously configured as a button automation in the **1x PDI Builder** software.

An example is given below:

Fig. 331: **Action Button example**



Choose platform * 4086

Select Event * Trim Button

Fig. 332: **Action Button configuration example**

Input Data

Input Data widgets allow the user to choose a certain variable and change its value by manually entering the value and sending it to the platform from the workspace during a flight.

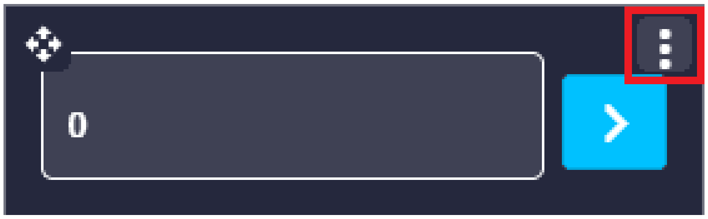


Fig. 333: **Input Data**

Click the ⋮ button to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Input Data configuration menu.

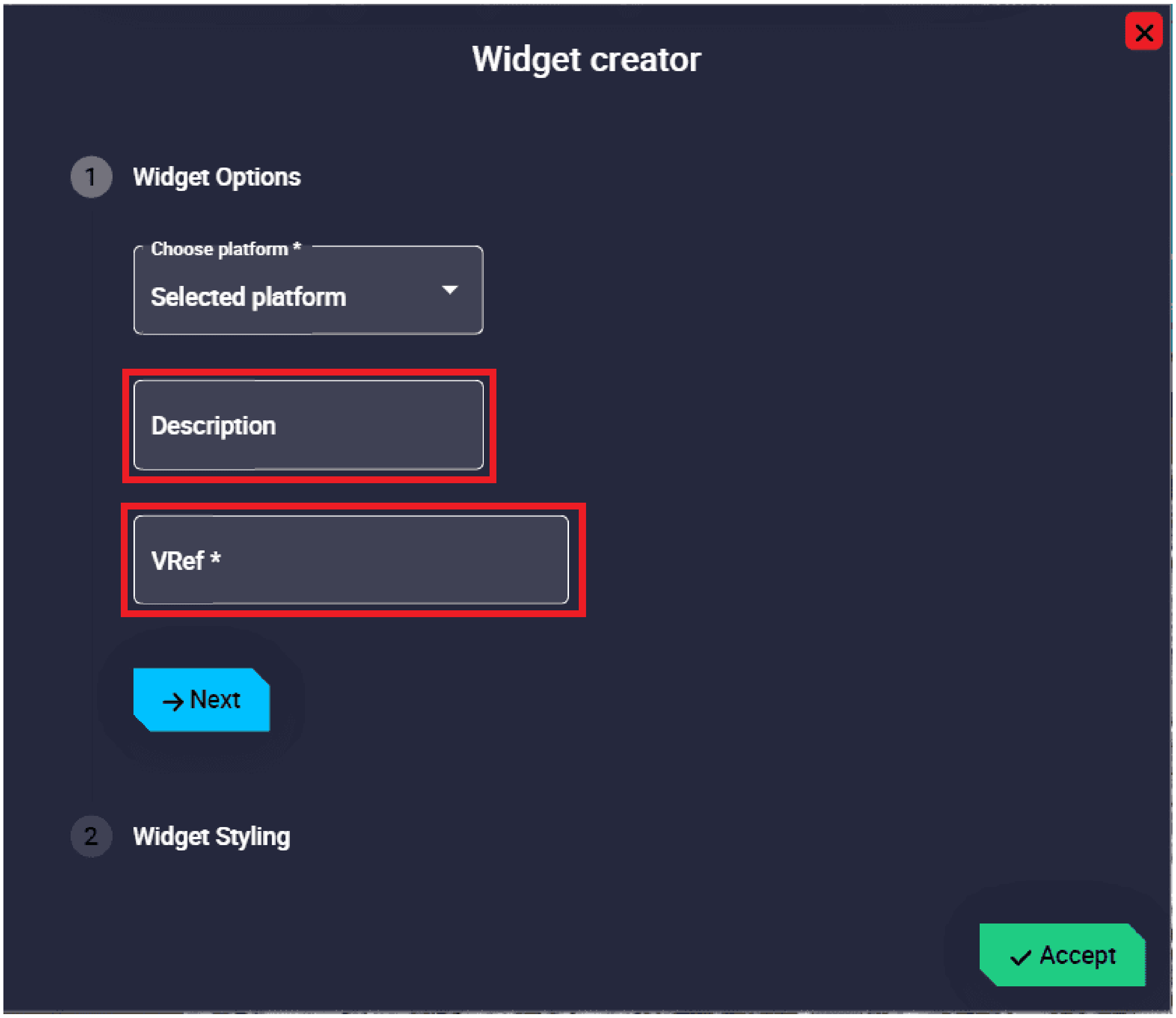


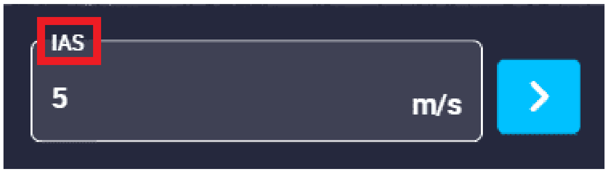
Fig. 334: **Input Data configuration**

  - **Widget Options**

    This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

    - **Description**: A description can be added to the widget by substituting the selected variable name.
    - **VRef**: Users can choose any real, integer or bit variable to be displayed on the widget.
    - **Unit**: Attention!! **This is only available with Real variables**.

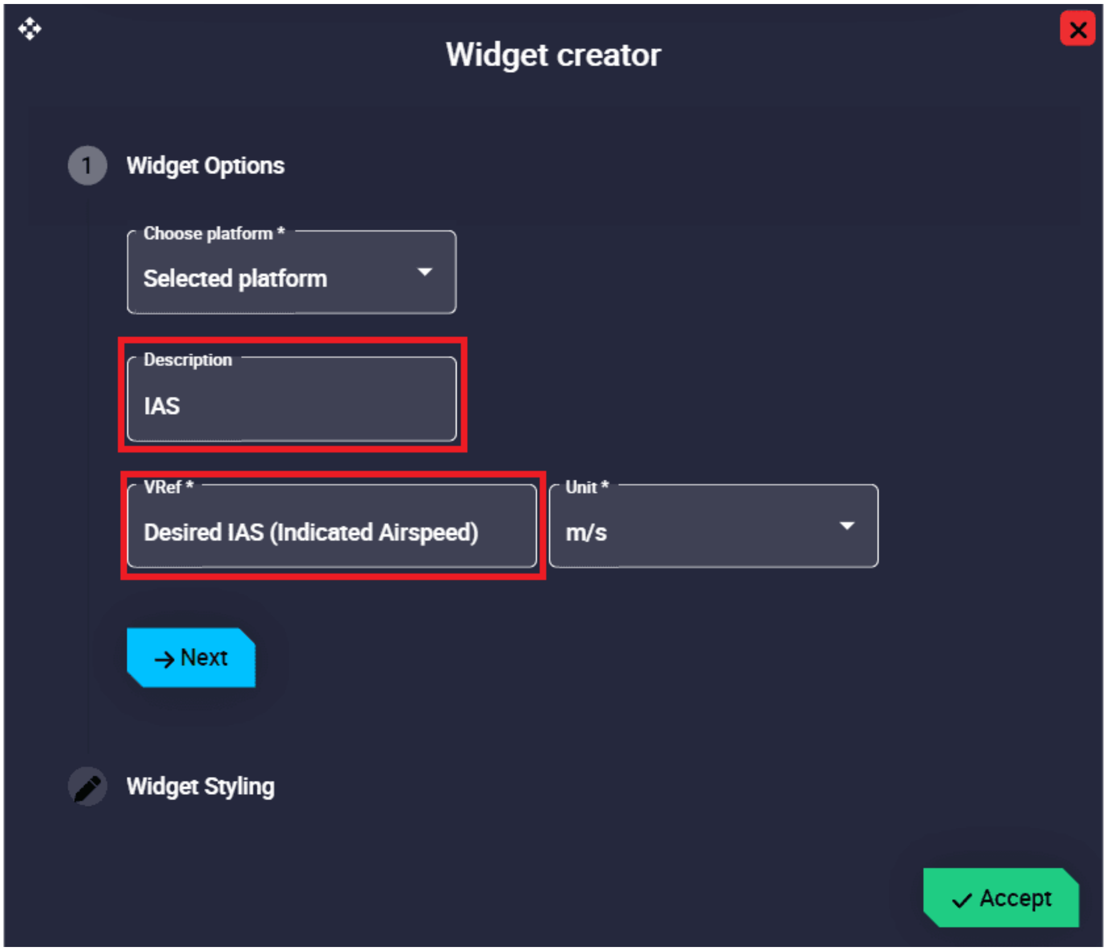
An example is given below:



IAS

5 m/s

Fig. 335: **Input Data example**



Choose platform *: Selected platform

Description: IAS

VRef *: Desired IAS (Indicated Airspeed)

Unit *: m/s

Fig. 336: **Input Data configuration example**

Stick

Stick (Virtual stick) widgets are created to simulate a radio controller that controls the platform channels directly from the computer.

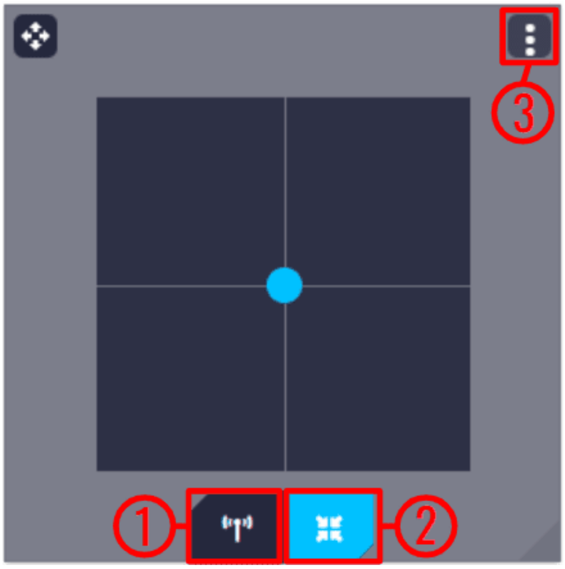


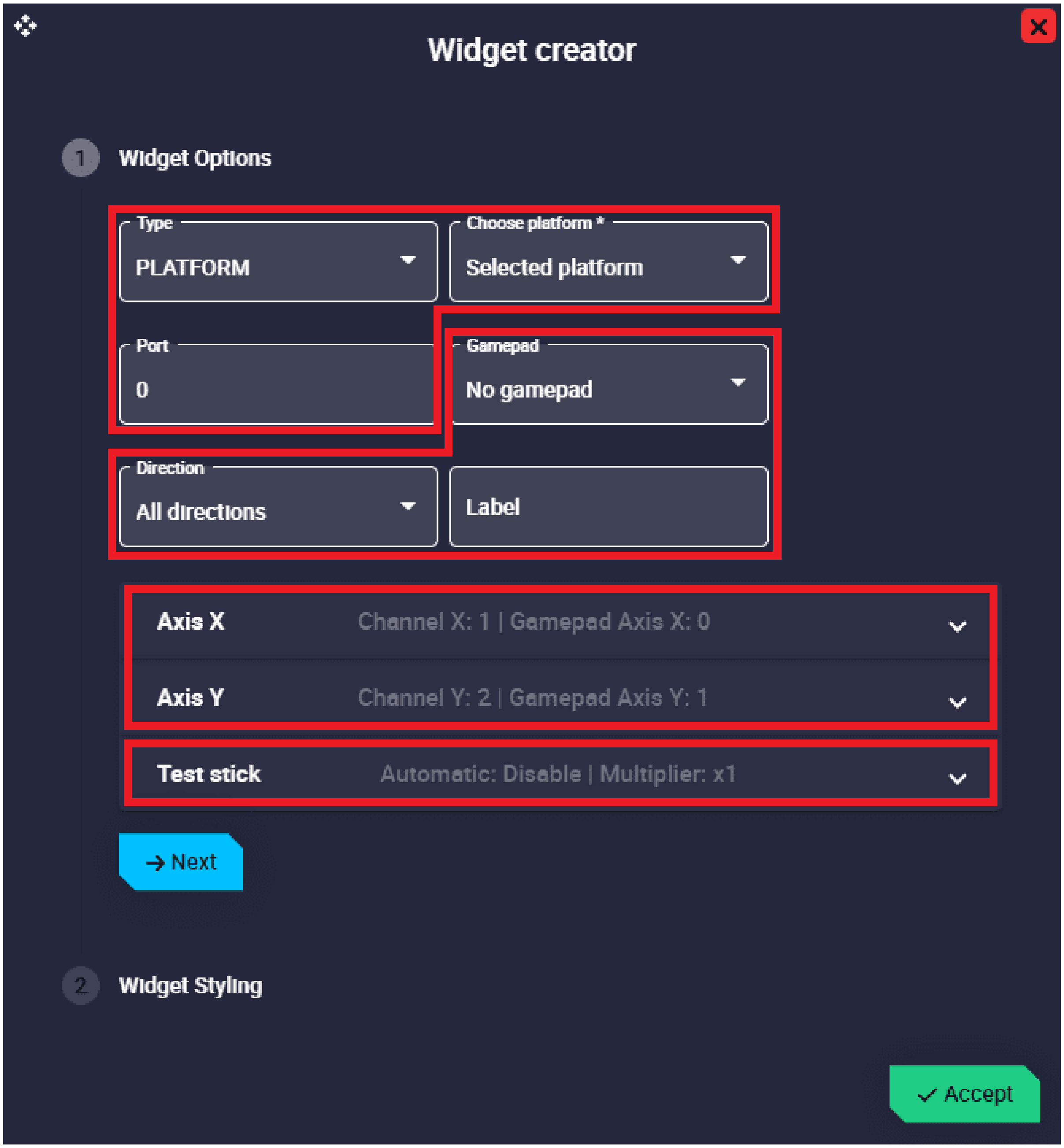
Fig. 337: **Stick**

On the stick display, there are 3 icons/buttons and their functions are as follows:

1. **Send command enable/disable**: Enables/Disables the virtual stick commands.

   > **Warning:** If the Stick is not actived, it will have no effect on the system.

2. **Go to center**: Returns the stick to the center.
3. **Options**
   - **Duplicate**: Duplicates this widget.
   - **Edit**: This allows the user to access the Stick configuration menu.



Type: PLATFORM
Choose platform *: Selected platform
Port: 0
Gamepad: No gamepad
Direction: All directions
Label
Axis X: Channel X: 1 | Gamepad Axis X: 0
Axis Y: Channel Y: 2 | Gamepad Axis Y: 1
Test stick: Automatic: Disable | Multiplier: x1

Fig. 338: **Stick configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

  - **Type**: Users can configure the widget stick to be used in "normal" mode, i.e. to control the **platform**, or to control a **gimbal** instead.

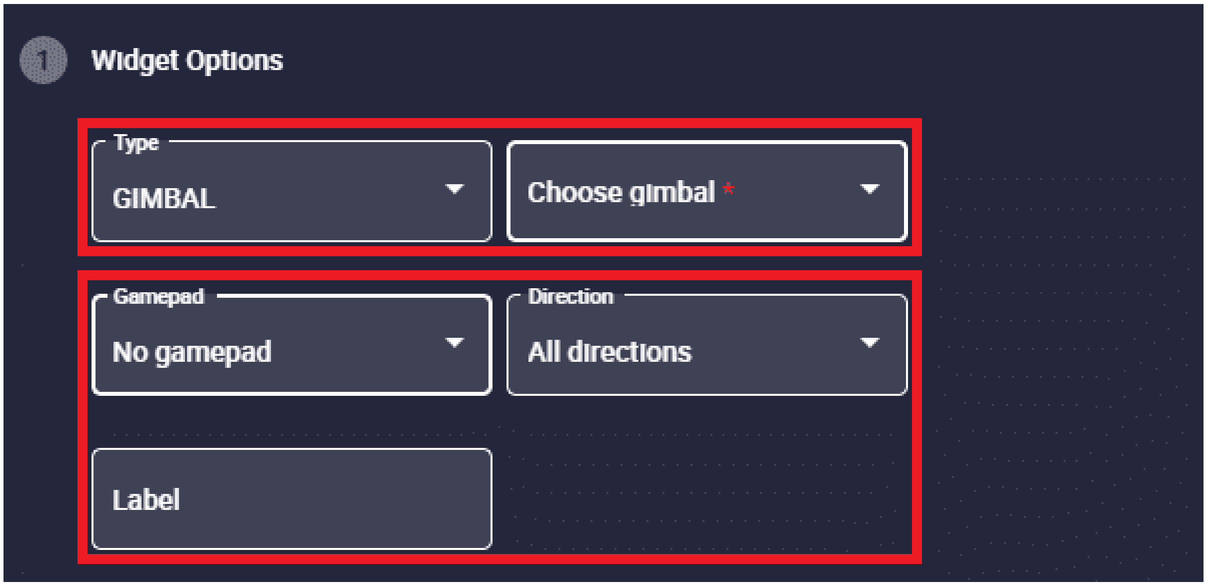


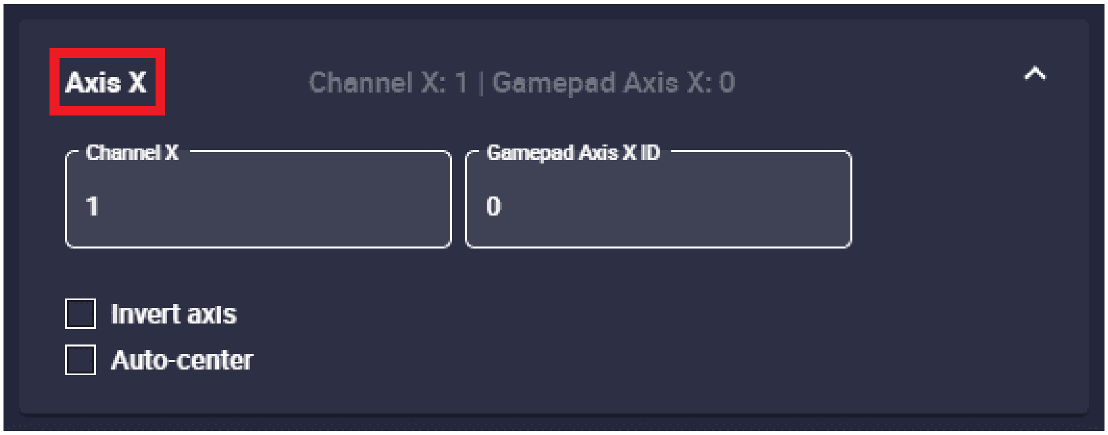
Fig. 339: **Stick configuration - Gimbal type**

- **Choose platform/gimbal**: Depending on the type selected, the user will have to choose the **platform** or the **gimbal** for which the widget is configured.
- **Port**: As it is posible to have more than one stick configured, each transmitter must be configured on a different port.

  This port must match the port configured in the **1x PDI Builder** software. For more information, see the Stick section of the **1x PDI Builder** user manual.

  Important: This parameter is **only available** when **PLATFORM** type is selected.
- **Gamepad**: Users must select a desired gamepad from the list for which the widget is configured.

  Important: If no physical gamepad (via USB) is connected to the PC, *No gamepad* option will be selected.
- **Direction**: The user has to configure the directions in which the stick can be moved, the available options are *All directions*, *Only vertical* and *Only horizontal*. By default, '*All directions*' option is selected.
- **Label**: If there is more than one stick widget, users can easily differentiate between them by configuring an identifying label for each one.
- **Axis X/Y**: *X* and *Y* axes must be configured.



Axis X

Channel X: 1 | Gamepad Axis X: 0

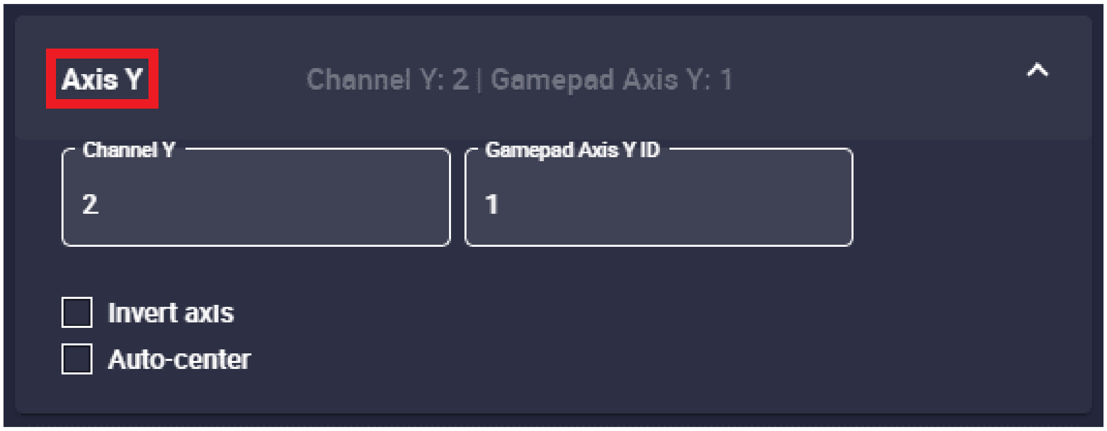
Channel X: 1

Gamepad Axis X ID: 0

☐ Invert axis

☐ Auto-center

Fig. 340: **Stick configuration - Axis X**



Axis Y

Channel Y: 2 | Gamepad Axis Y: 1

Channel Y: 2

Gamepad Axis Y ID: 1

☐ Invert axis

☐ Auto-center

Fig. 341: **Stick configuration - Axis Y**

- **Channel X/Y**: Select which channel is controlled by each axis. By default, channel 1 is configured for the *X* axis and channel 2 for the *Y* axis.
- **Gamepad Axis X/Y ID**: Correlation of the physical gamepad axis IDs with those of the virtual stick.

  Important: If no physical gamepad (via USB) is connected, this parameter has no effect on the widget. It can be left at the default value.

- **Invert axis**: If enabled, the minimum and maximum of the axis in the variable associated with this channel will be inverted.

  For example, if in the *Y* axis, the **bottom of the axis** corresponds to a value of **0** in the *stick input r2* variable. If the **Inverted axis** is **enabled**, now the **bottom of the axis** will correspond to a value of **1** in the variable.

- **Auto-center**: When activated, the stick automatically returns to the center position when released.

- **Test stick**: This option is used to generate stick inputs that are introduced in the system. This is a way to check how the system behaves when a stick command enters the autopilot.

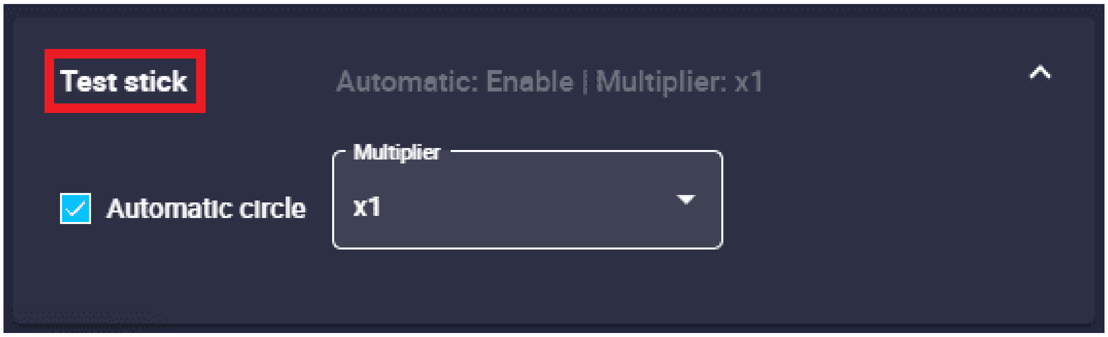


Fig. 342: **Stick configuration - Test stick**

- ∗ **Automatic circle**: An automatic circle test is activated.
- ∗ **Multiplier**: The speed of the test can be adjusted. Available options are: *x1*, *x2*, *x4*, *x8* and *x16*.

An additional button appears in the widget to start/stop the test.

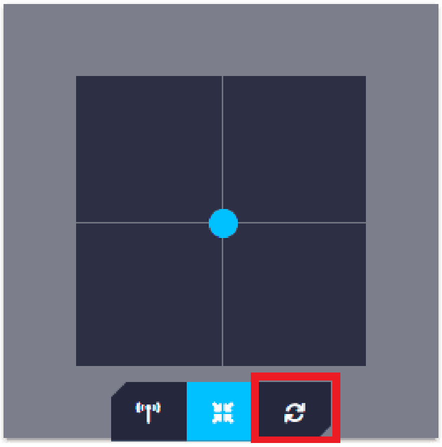


Fig. 343: **Stick configuration - Test stick button**

An example is presented below:

Fig. 344: **Stick configuration - Test stick example**

- **Remove**: Deletes this widget.

Dial Button

Dial Button widgets group different *action button* into a single ‘drop-down’ button.

Fig. 345: **Dial Button**

When clicked, the action buttons will appear/disappear.

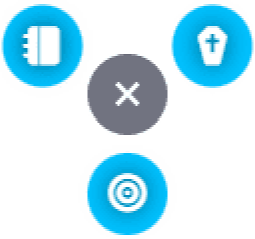
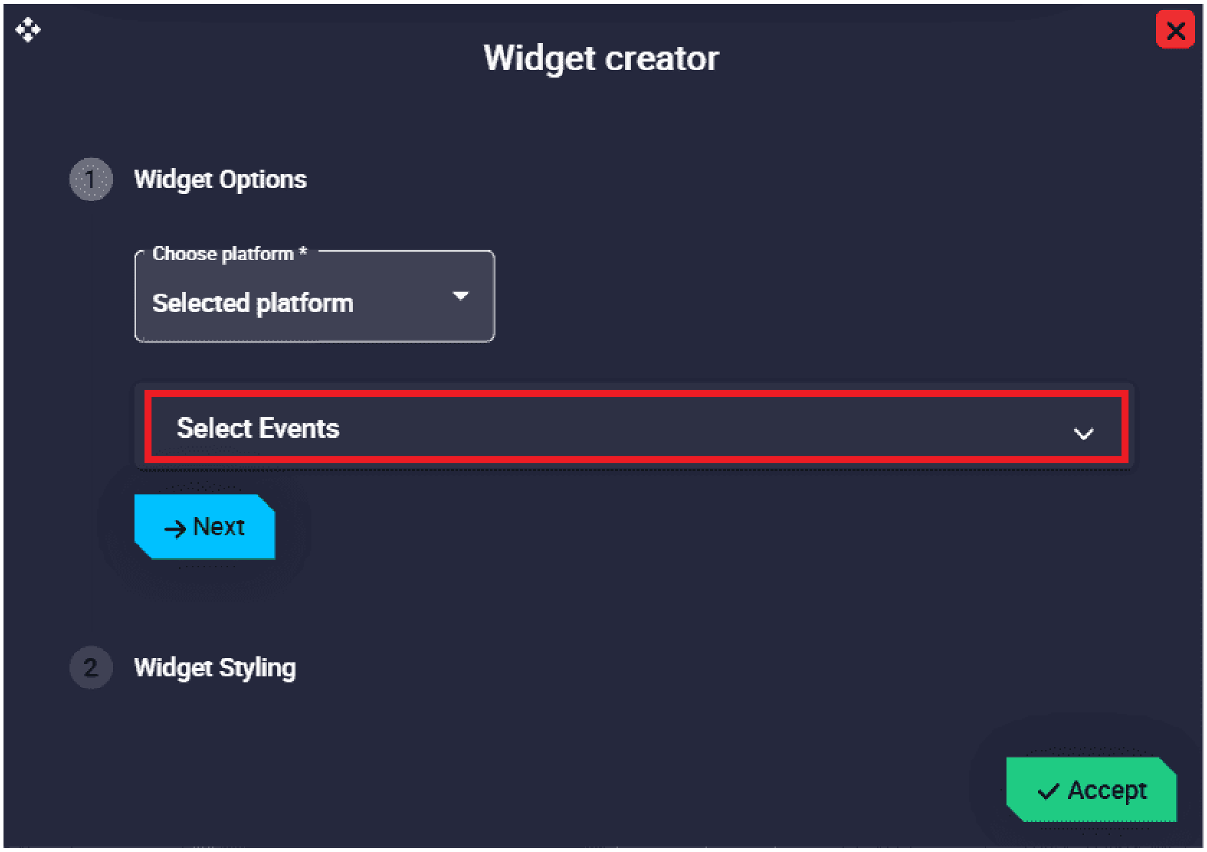


Fig. 346: **Dial Button - Action buttons**

Right click on the **widget** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Dial Button configuration menu.

  This widget has only **one extra edit parameter** compared to the ones described in *Widget common configuration*:



Widget creator

1 Widget Options

Choose platform *: Selected platform

Select Events

Fig. 347: **Dial Button configuration**

  - **Widget Options** → **Select Events**: Select the desired button events that will be displayed as action buttons on the Dial Button. These events must be previously configured as automations in the **1x PDI Builder** software.

An example is given below:

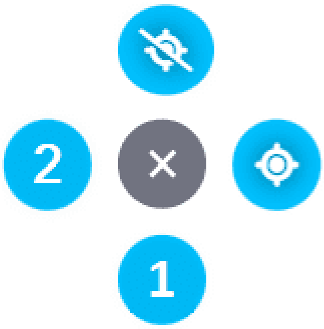


Fig. 348: **Dial Button example**

These action buttons can be ordered in the configuration:

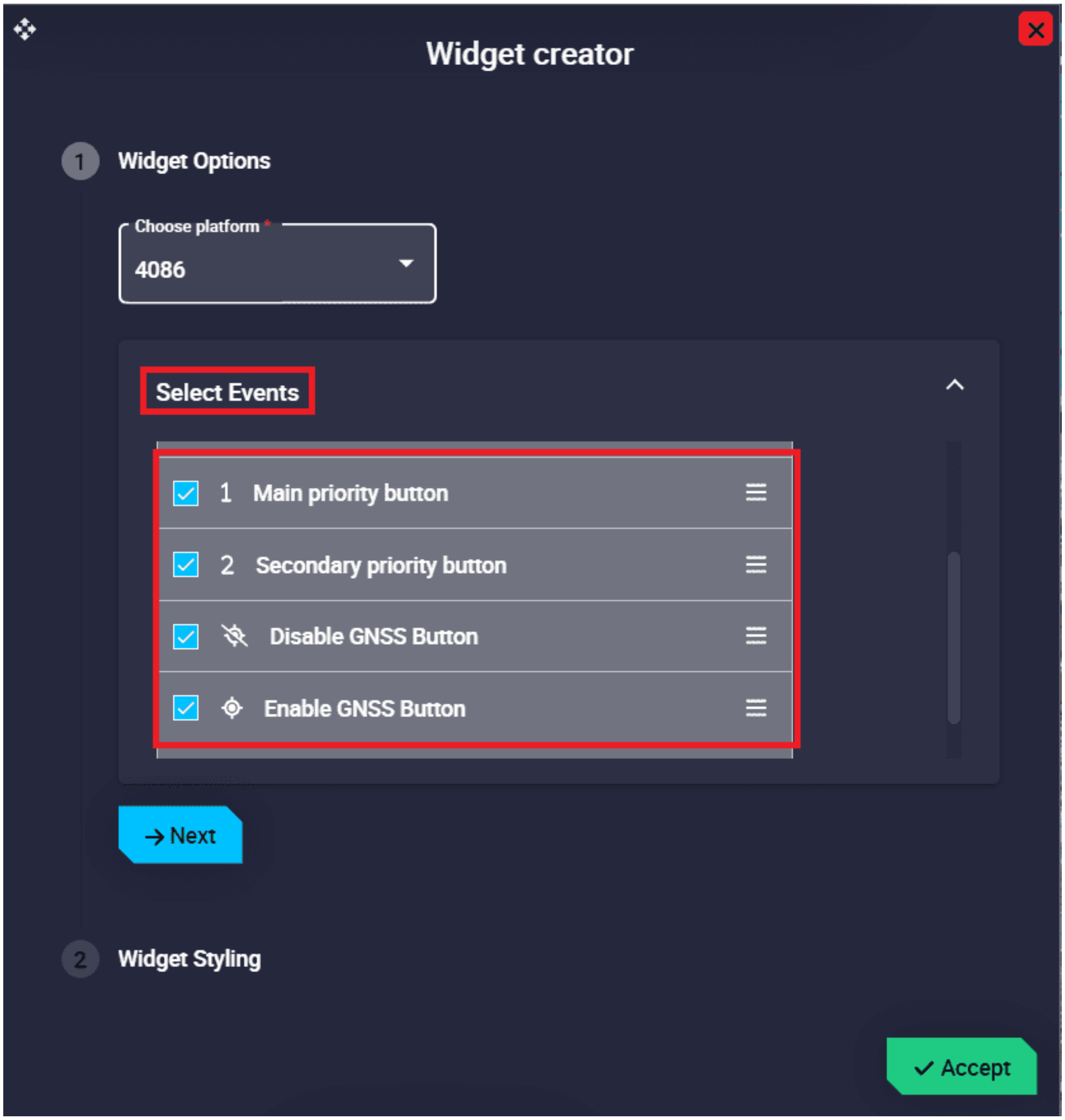


Fig. 349: **Dial Button configuration example**

Gimbal Buttons

Gimbal Buttons widget groups different control buttons of the selected gimbal into a single ‘drop-down’ button.

Fig. 350: **Gimbal Buttons**

When clicked, the control buttons will appear/disappear.

Right click on the **widget** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Gimbal Buttons configuration menu.

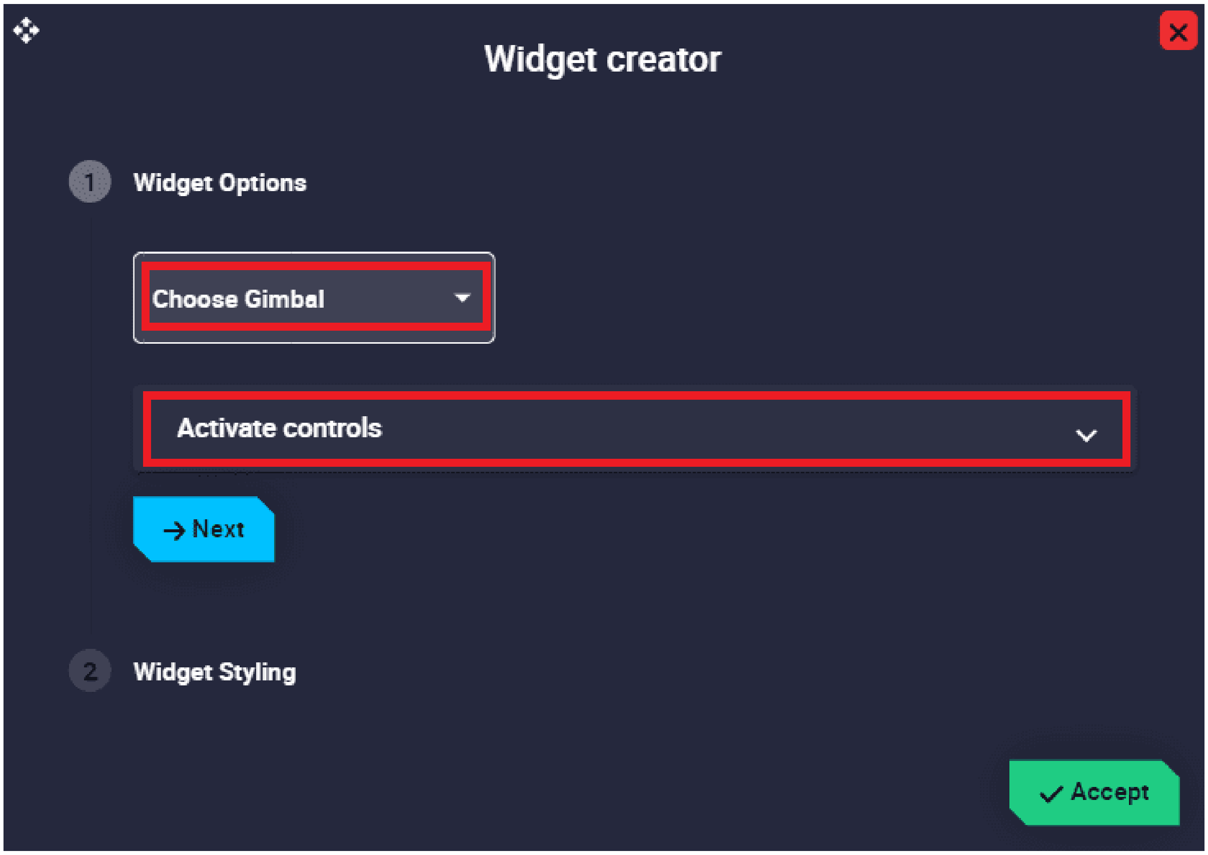


Fig. 351: **Gimbal Buttons configuration**

  - **Widget Options**:
    - **Choose Gimbal**: The user has to choose from the gimbal predefined list the gimbal for which the widget is configured.
    - **Activate controls**: Select the desired controls of the selected gimbal that will be displayed on the Gimbal Buttons.

    Important: The controls shown here depend on the selected gimbal, each gimbal has its own control buttons.

Below is an example with the **NextVision gimbal**:

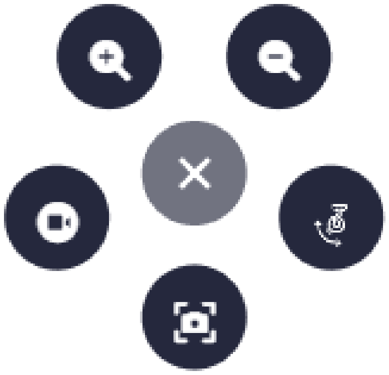
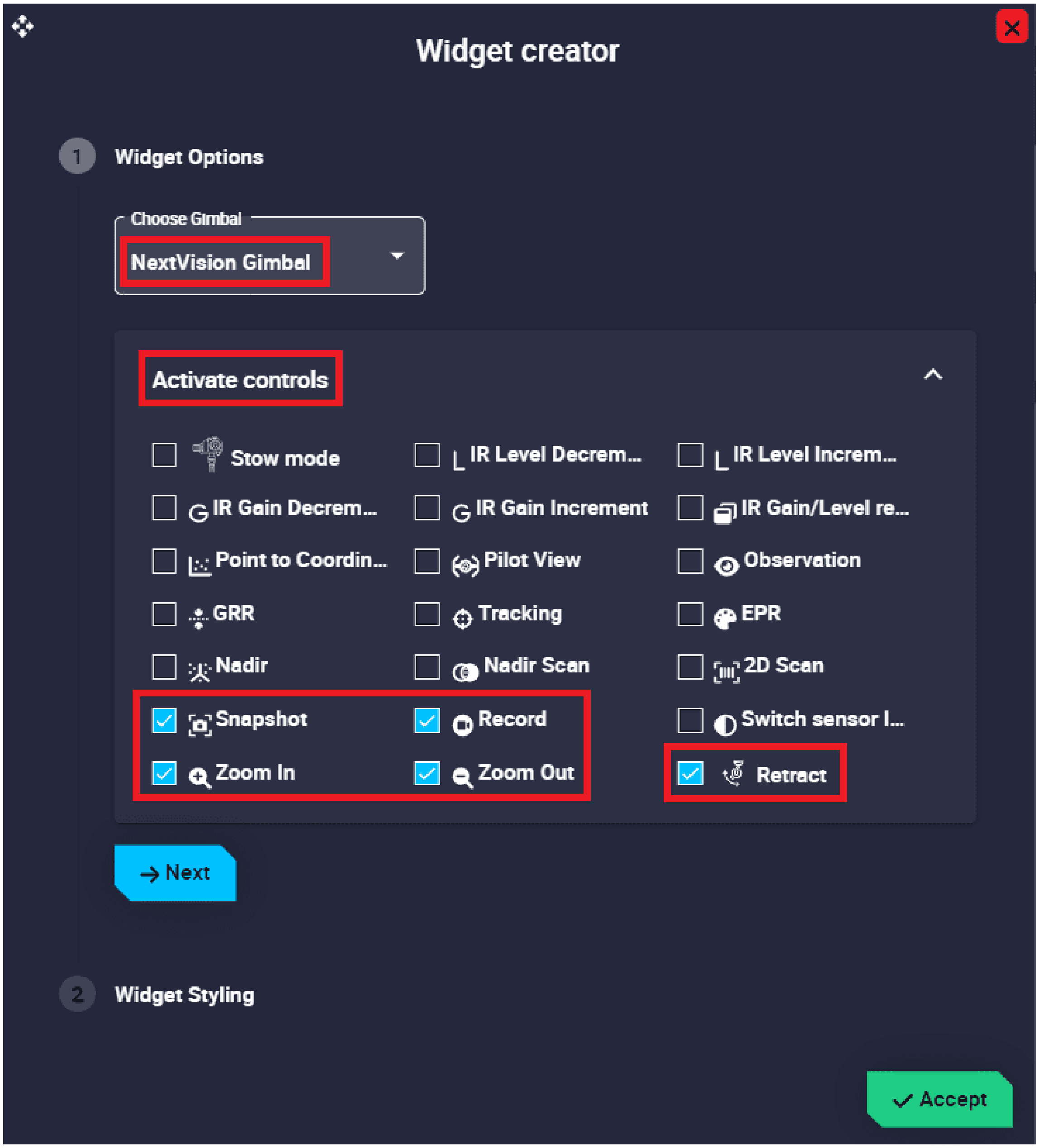


Fig. 352: **Gimbal Buttons example**

These control buttons can be enabled/disabled in the configuration:



Choose Gimbal: NextVision Gimbal

☐ Stow mode ☐ IR Level Decrem... ☐ IR Level Increm...
☐ IR Gain Decrem... ☐ IR Gain Increment ☐ IR Gain/Level re...
☐ Point to Coordin... ☐ Pilot View ☐ Observation
☐ GRR ☐ Tracking ☐ EPR
☐ Nadir ☐ Nadir Scan ☐ 2D Scan
☑ Snapshot ☑ Record ☐ Switch sensor I...
☑ Zoom In ☑ Zoom Out ☑ Retract

Fig. 353: **Gimbal Buttons configuration example**

Gimbal Setup

Gimbal Setup widget is a gimbal configuration panel, where the user can choose which gimbal controls can be managed from **Veronte Ops**.

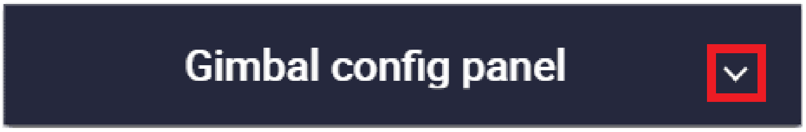


Fig. 354: **Gimbal Setup**

Note that, as this widget behaves like a drop-down menu, clicking on the ⌄ icon will display all gimbal controls:

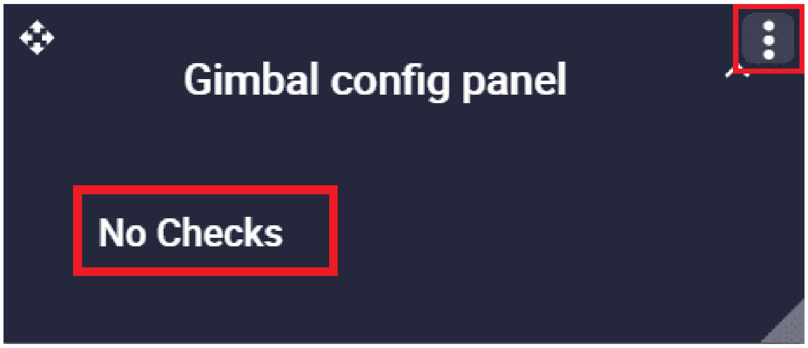


Fig. 355: **Gimbal Setup deployed**

Note: As no controls have been configured yet, *No Checks* is displayed when deployed.

Click the ⋮ button to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Gimbal Setup configuration menu.

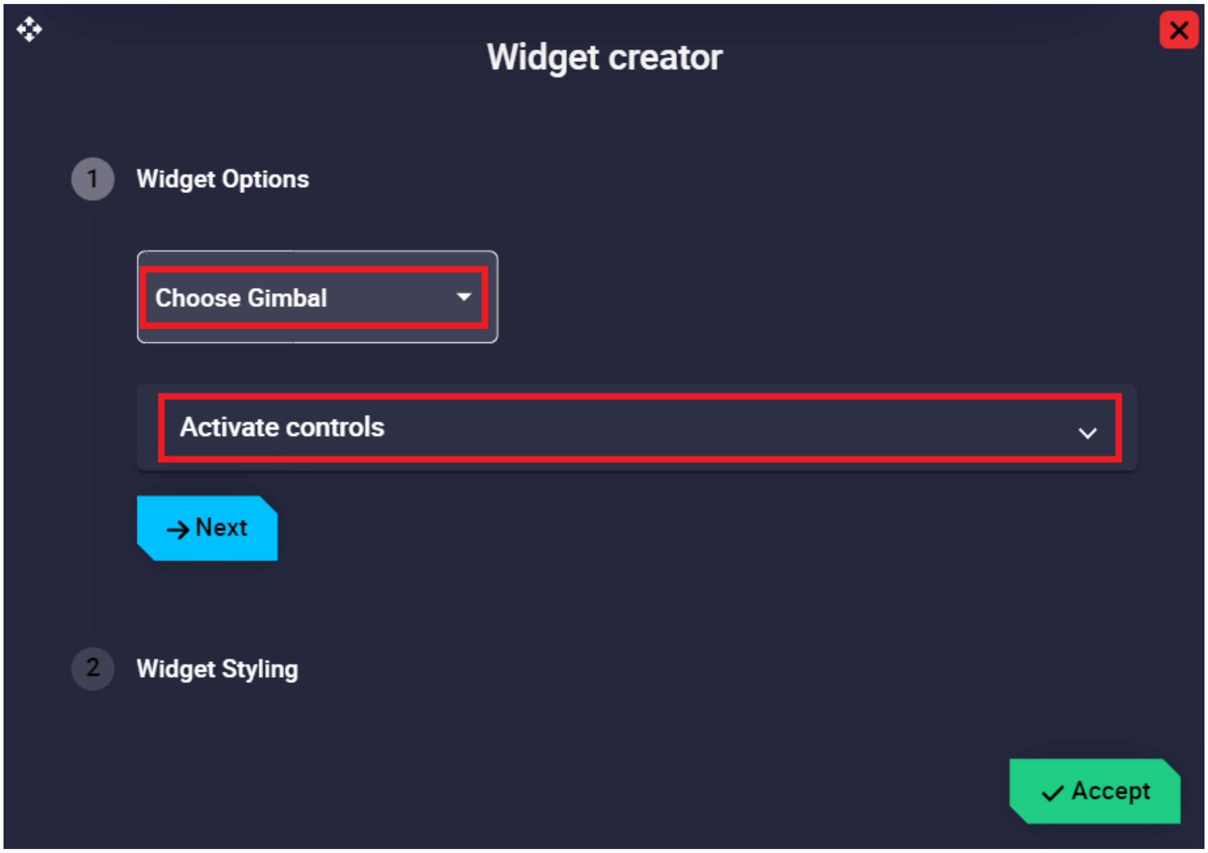
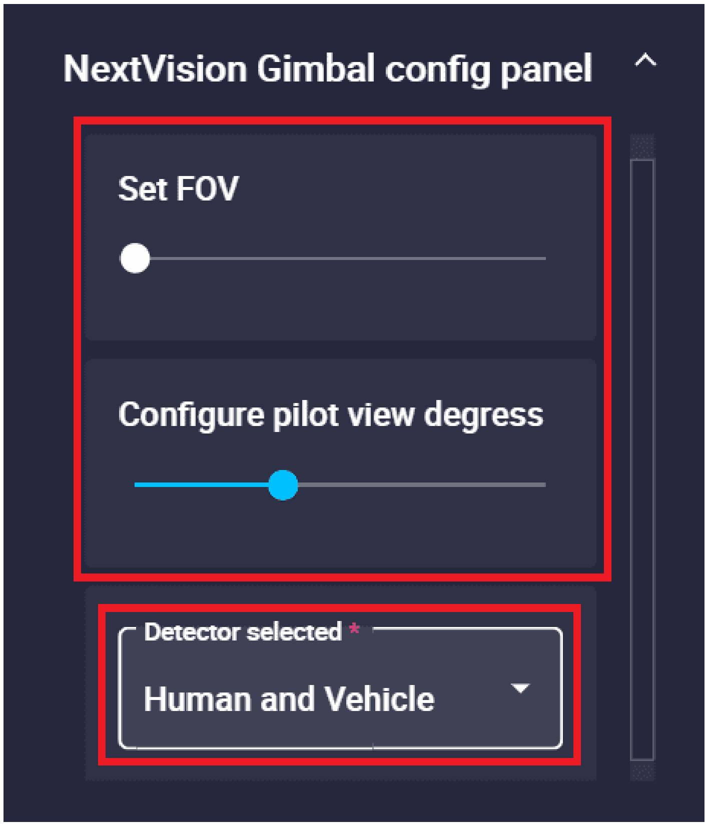


Fig. 356: **Gimbal Setup**

- **Widget Options**:
    - **Choose Gimbal**: The user has to choose from the gimbal predefined list the gimbal for which the widget is configured.
    - **Activate controls**: Select the desired controls of the selected gimbal that will be displayed on the gimbal configuration panel.

    Important: The controls shown here depend on the selected gimbal, each gimbal has its own controls.

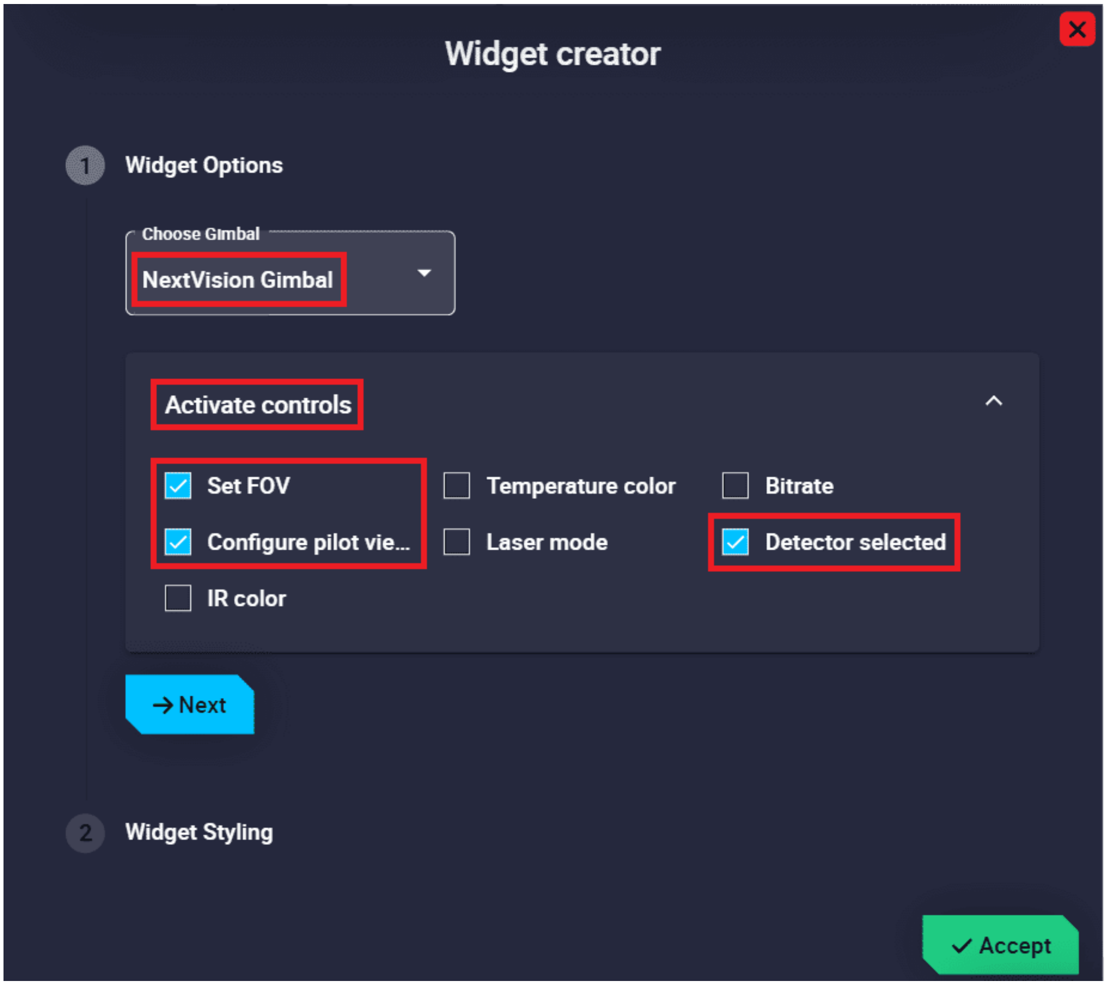
Below is an example with the **NextVision gimbal**:



Detector selected *
Human and Vehicle

Fig. 357: **Gimbal Setup example**

These controls can be activated/deactivated in the configuration:



Choose Gimbal: NextVision Gimbal

Activate controls

☑ Set FOV
☐ Temperature color
☐ Bitrate
☑ Configure pilot vie...
☐ Laser mode
☑ Detector selected
☐ IR color

Fig. 358: **Gimbal Setup configuration example**

As can be seen in the example above, these controls can be in form of sliders, drop-down menus, etc.

Important: This will also depend on the pre-configured controls for each gimbal model.

Knob

Knob widget is similar to the *slider widget* but in circular format. It also allows the user to choose a certain variable and change its value by simply moving the circular bar to the desired value from the workspace during a flight.

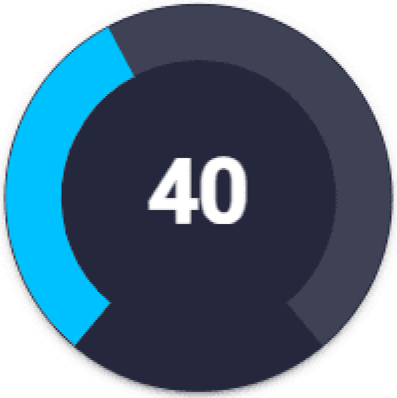


Fig. 359: **Knob**

Right click on the **widget** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Options** → **Edit**: This allows the user to access the Knob configuration menu.

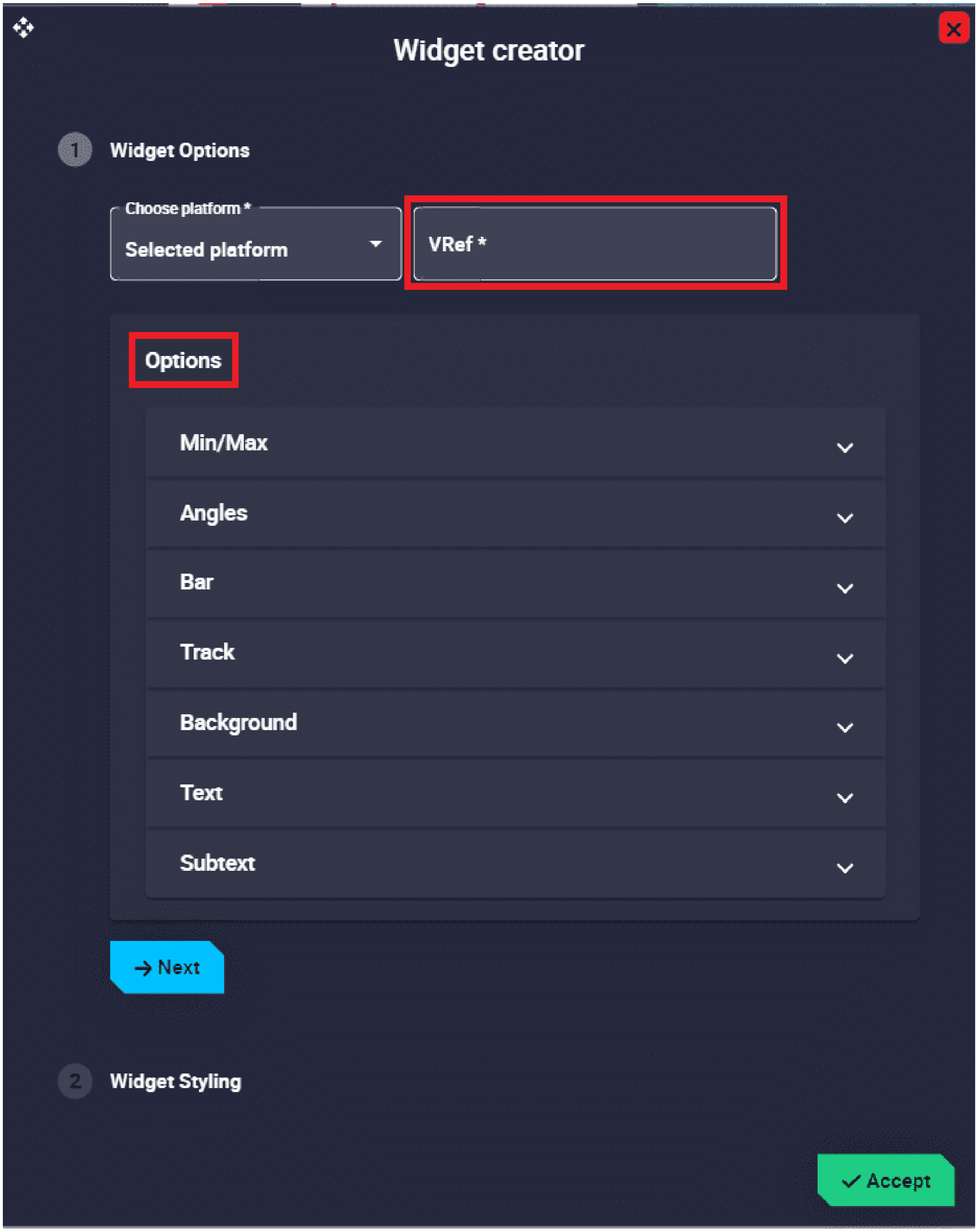


Fig. 360: **Knob configuration**

- **Widget Options**

  This widget has **extra edit parameters** compared to the ones described in the *Widget common configuration*.

- **VRef**: Users can choose any real, integer or bit variable to be displayed on the knob.
- **Unit**: Attention!! **This is only available with Real variables**.
- **Options**: This widget is highly customizable by simply modifying the following parameters:
  - **Min/Max**: Minimum and maximum values displayed in the knob. Defaults are 0 and 100 respectively.
  - **Angles**: Start and end angle of the position of the minimum and maximum values respectively.

    Defaults are -140 and 140 respectively.
  - **Bar**:
  - **Cap**: This parameter allows users to choose whether they want the **ends of the bar** to be **right angles** or **rounded**.

    ⇒ **100% rounded = 50% of the width** parameter.
  - **Width**: The user can modify the width of the bar as desired. By default it is set to 20.
  - **Step**: Here users must enter the step by which they want the bar to move. By default it is set to 1.
  - **Color**: This is the color in which the bar is drawn.
  - **Display previous bar**: If enabled, the bar stays colored at the position of the previously set value while the bar is moving to set the new value. Default is enabled.
  - **Color**: Color of the previous bar.

    An example is given below:

    Fig. 361: **Knob configuration - Display previous bar option enabled**
  - **Track**: This parameter refers to the bar between the minimum and maximum values defined above, which is always below the bar that indicates the desired value.
  - **Track cap**: This parameter allows users to choose whether they want the **ends of the track bar** to be **right angles** or **rounded**.

    ⇒ **100% rounded = 50% of the track width** parameter.
  - **Track width**: The user can modify the width of the track bar as desired. By default it is set to 20.
  - **Color**: This is the color in which the track bar is drawn.
  - **Background**:
  - **Color**: Color of the knob widget background.
  - **Full**: If enabled, the entire knob widget is colored with the previously defined color. Otherwise, the knob will only be colored between the previously defined start and end angles. By default it is enabled.

    In the following example, the start and end angles are set to -90 and 90 respectively.

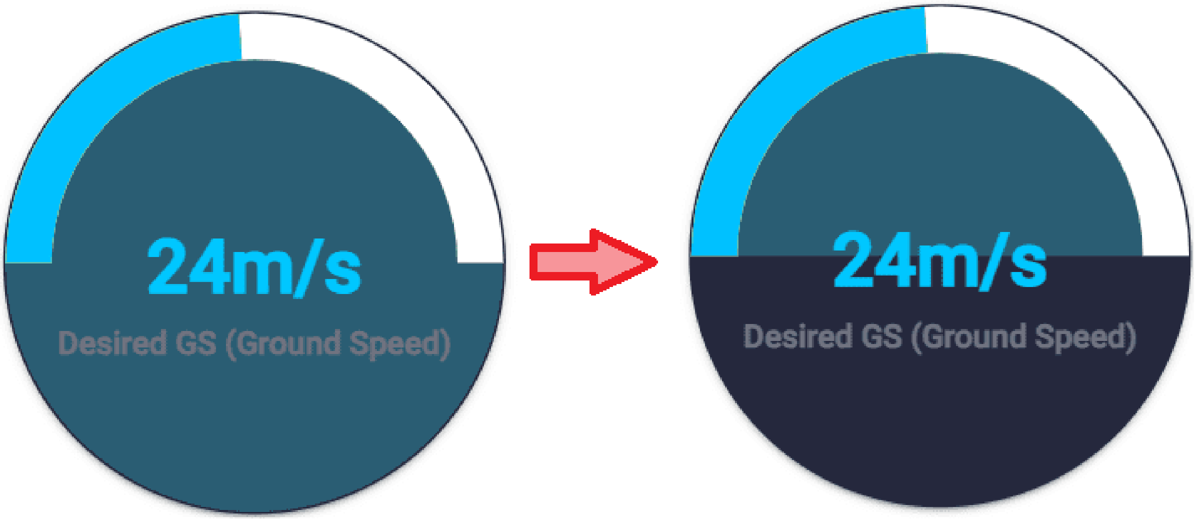


Fig. 362: **Knob configuration - Full option enabled/disabled respectively**

- **Text**: This text refers to the value of the selected variable displayed in the knob.
- **Display**: If enabled, displays on the knob the value of the selected variable. By default it is enabled.
- **Size**: The size of the text value can be modified. Default is 32.
- **Weight**: The weight of the text value can be modified. The available options go from 100 to 900, default is 700.
- **Color**: Color in which the value is displayed.
- **Subtext**: This subtext refers to the name of the selected variable displayed in the knob.
- **Display**: If enabled, displays on the knob the name of the selected variable. By default it is enabled.
- **Offset**: Vertical position of the selected variable name can be adjusted as desired. Default is 7.
- **Size**: The size of the selected variable name can be changed. By default it is set to 14.
- **Weight**: The weight of the selected variable name can be changed. The available options go from 100 to 900, default is 700.
- **Color**: Color in which the selected variable name is displayed.

An example is given below:

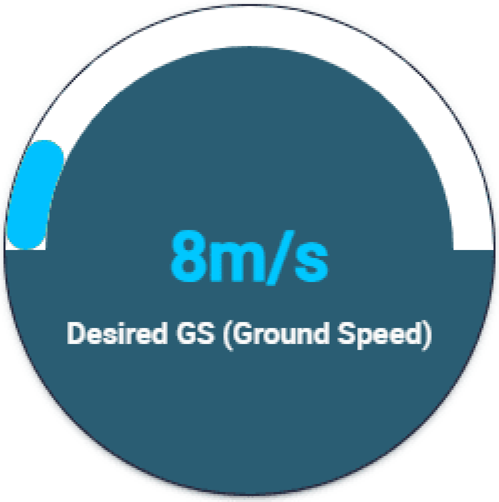
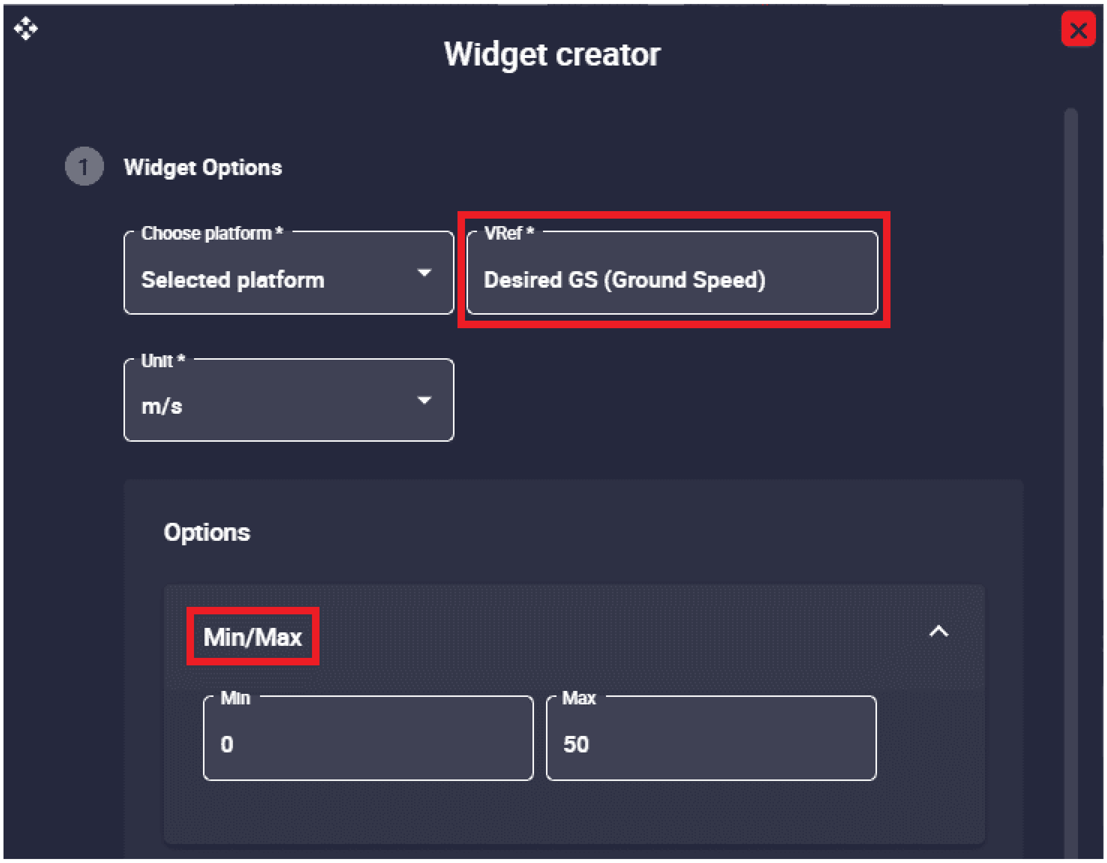


Fig. 363: **Knob example**

The configuration for this example is as follows:



Widget creator

1 Widget Options

Choose platform *: Selected platform

VRef *: Desired GS (Ground Speed)

Unit *: m/s

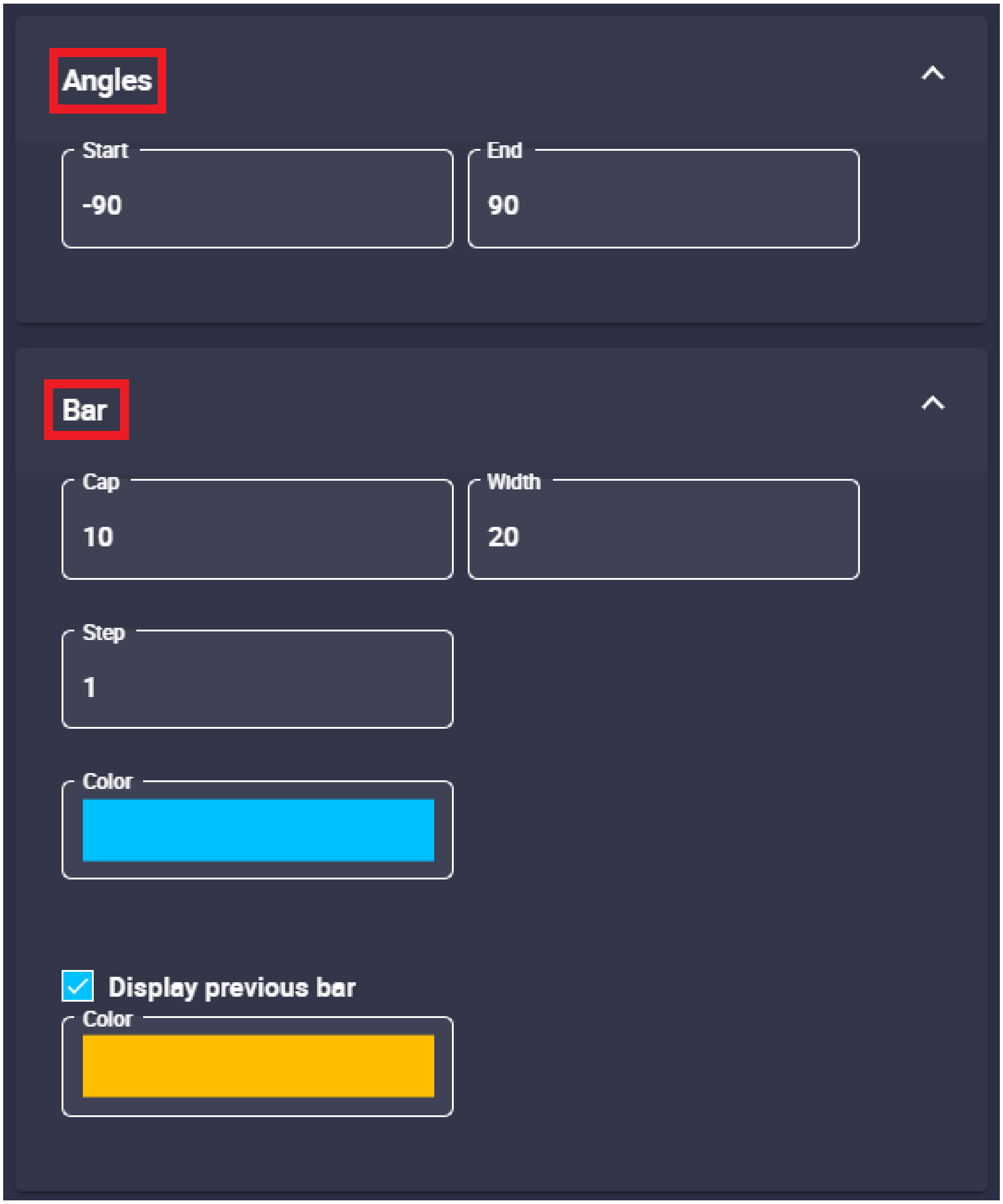
Options

Min/Max

Min: 0

Max: 50

Fig. 364: **Knob configuration example - Variable and Min/Max option**



Angles

Start: -90

End: 90

Bar

Cap: 10

Width: 20

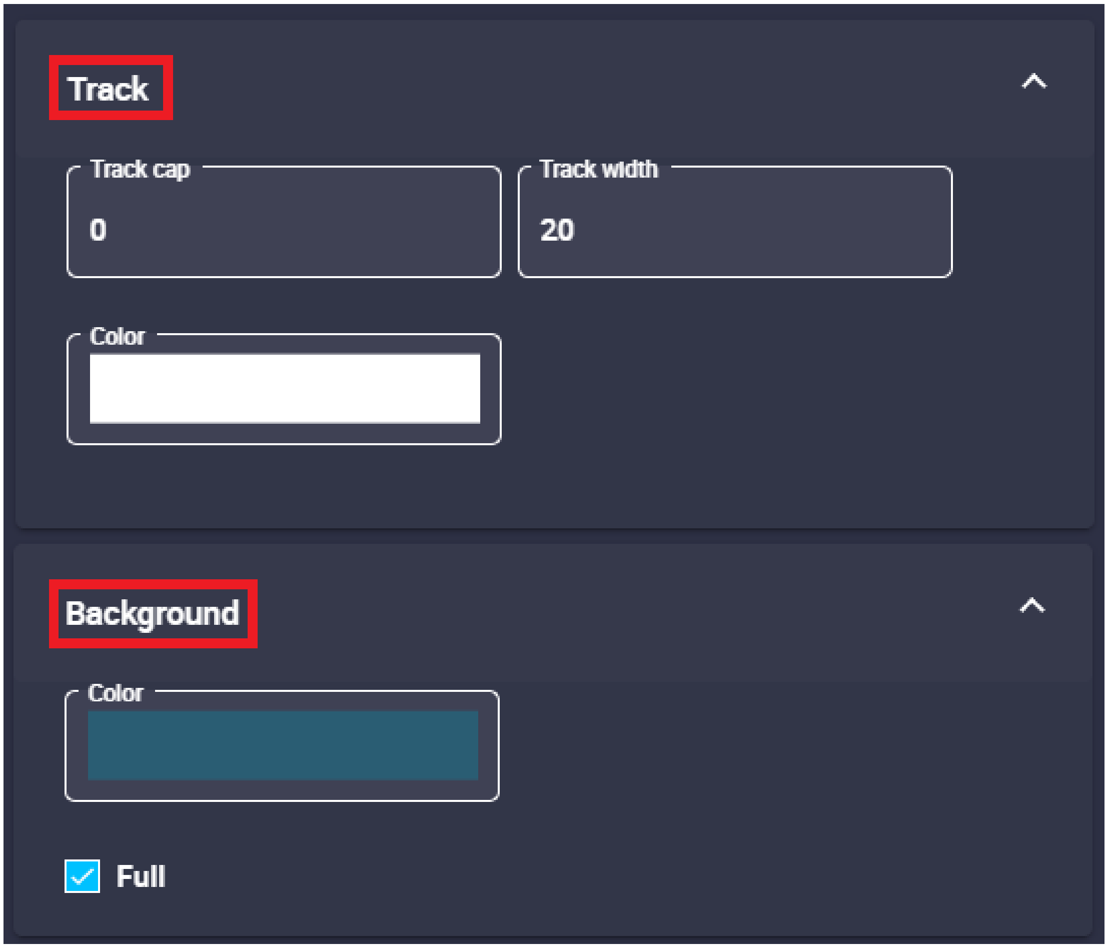
Step: 1

Color

☑ Display previous bar

Color

Fig. 365: **Knob configuration example - Angles and Bar options**



Track

Track cap: 0

Track width: 20

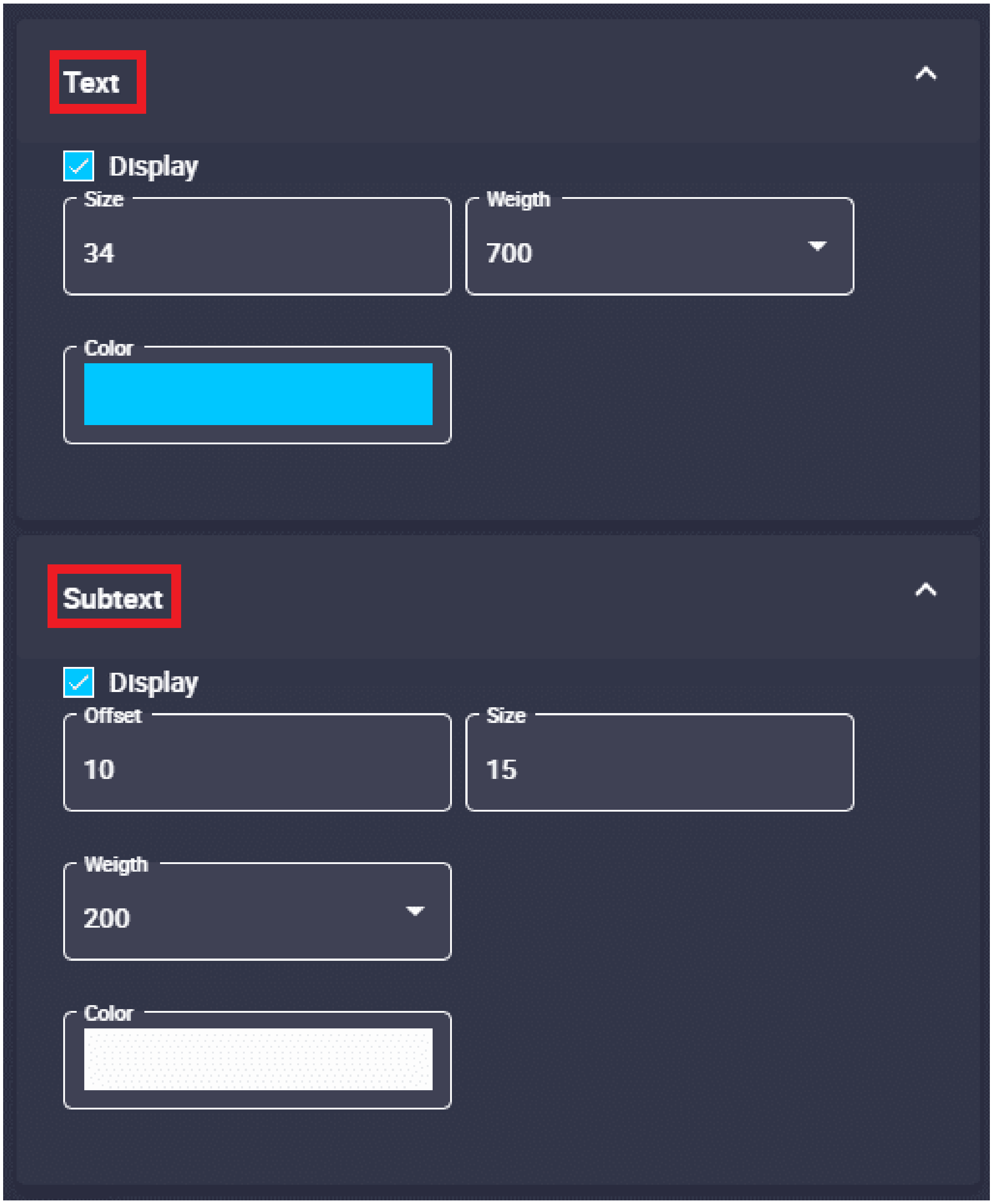
Color

Background

Color

☑ Full

Fig. 366: **Knob configuration example - Track and Background options**



Text

☑ Display

Size: 34

Weigth: 700

Color: 🟦

Subtext

☑ Display

Offset: 10

Size: 15

Weigth: 200

Color: ⬜

Fig. 367: **Knob configuration example - Text and Subtext options**

3.5.2.2.6 Flight instruments

Attitude

The attitude widget, commonly known as Primary Flight Display (**PFD**) or 'artificial horizon', represents graphically the attitude of the aircraft (**roll** and **pitch**).

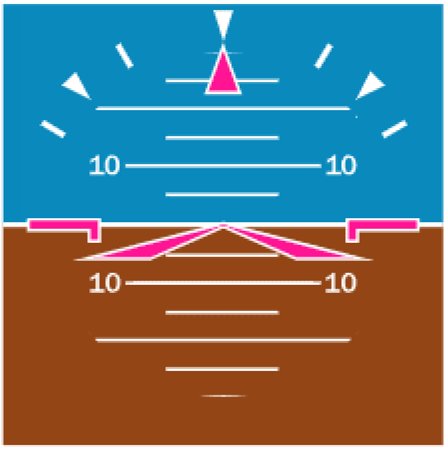
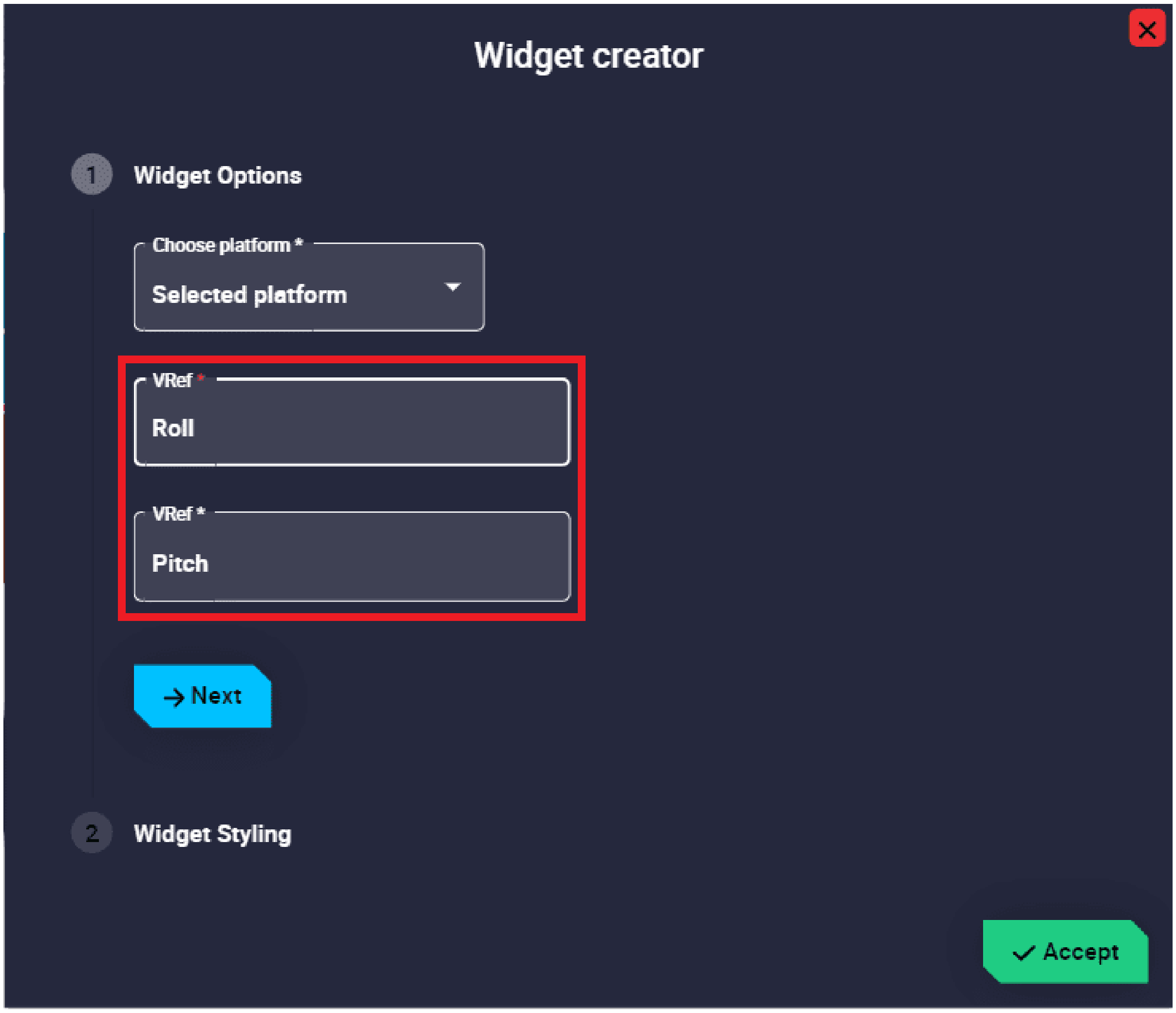


Fig. 368: **Attitude**

Right click on the **widget** to access its options (**Duplicate**, **Edit** and **Remove**).

- **Duplicate**: Duplicates this widget.
- **Edit**: This allows the user to access the Attitude configuration menu.

  This widget has **two extra edit parameters** compared to the ones described in the *Widget common configuration*.



Widget creator

1 Widget Options

Choose platform *: Selected platform

VRef *: Roll

VRef *: Pitch

2 Widget Styling

Fig. 369: **Attitude configuration**

- **Widget Options**:
  - **VRef**: Users can choose from the **real angular variables** of the system to be displayed as **the roll of the widget**. By default, the variable Roll is displayed.
  - **VRef**: Users can choose from the **real angular variables** of the system to be displayed as **the pitch of the widget**. By default, the variable Pich is displayed.
- **Remove**: Deletes this widget.

Heading

The heading widget, commonly known as **compass**, usually shows the platform's yaw relative to the magnetic north.

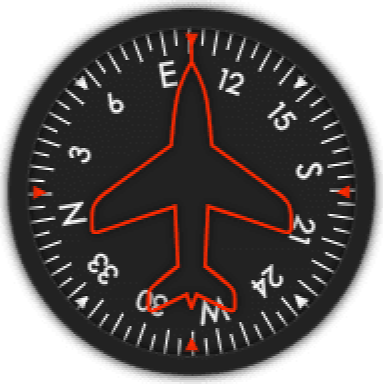
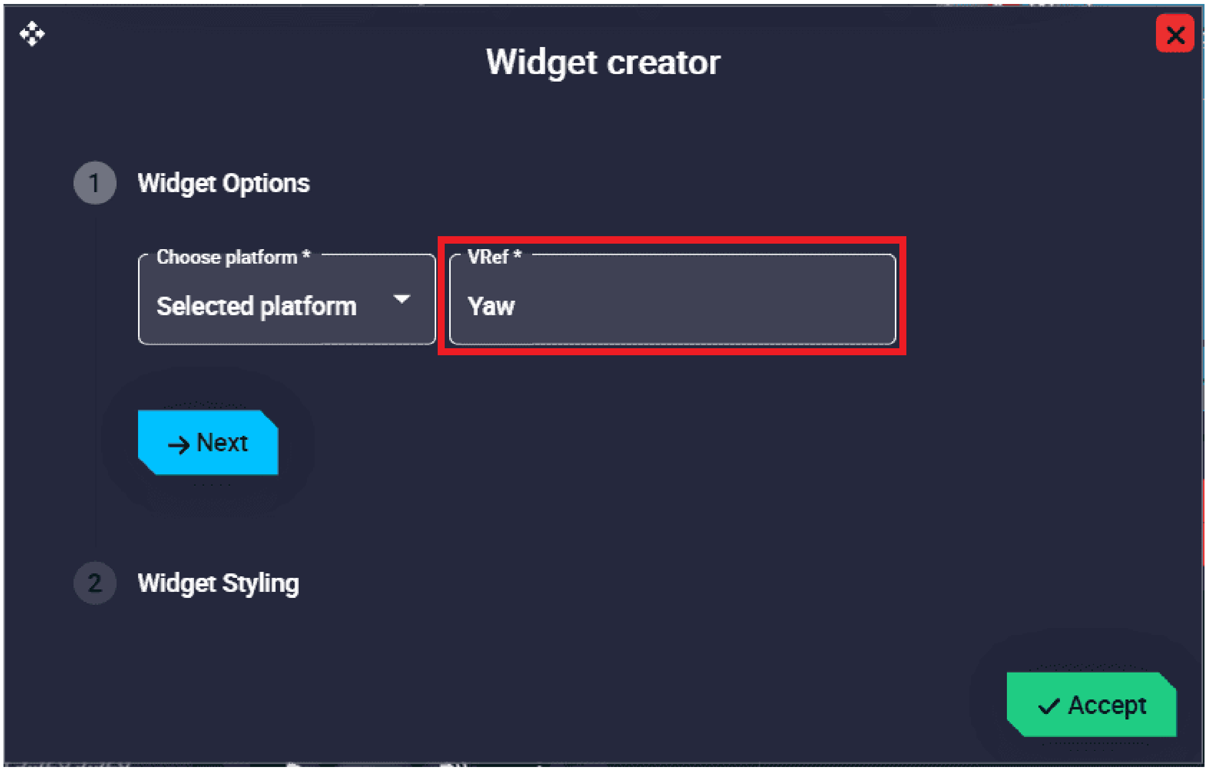


Fig. 370: **Heading**

Right click on the **widget** to access its options:

- **Duplicate**: Duplicates this widget.
- **Edit**: This allows the user to access the Heading configuration menu.

  This widget has only **one extra edit parameter** compared to the ones described in *Widget common configuration*:



Choose platform *: Selected platform

VRef *: Yaw

Fig. 371: **Heading configuration**

  – **Widget Options** → **VRef**: Users can choose between the **real angular variables** of the system to be displayed. By default, the variable Yaw is displayed.

- **Remove**: Deletes this widget.

CHAPTER

FOUR

INTEGRATION EXAMPLES

4.1 Gimbal

The following diagram summarizes the "connection" and "elements" required to view video recording and/or command a gimbal in Veronte Ops:

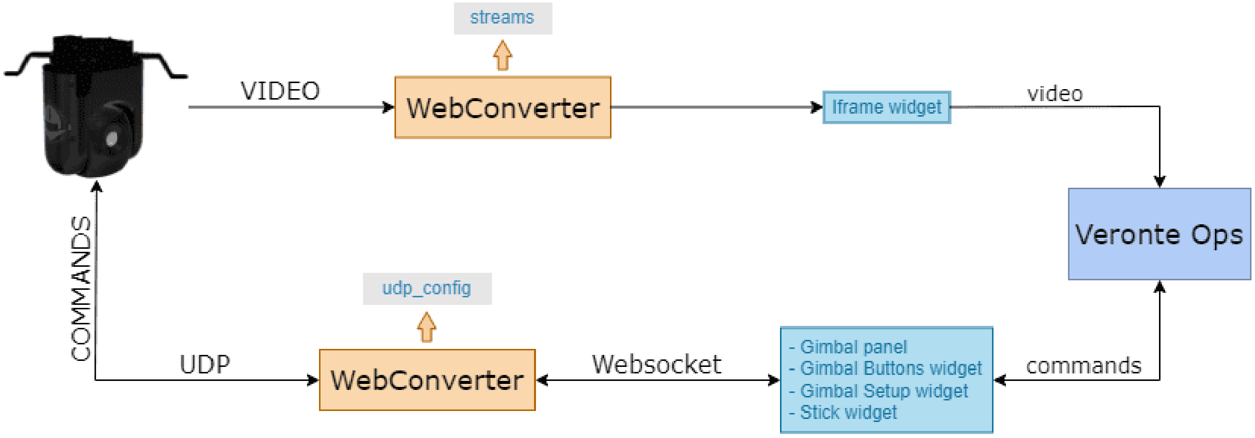


Fig. 1: **Gimbal connection diagram**

To configure and control a gimbal from Veronte Ops, the following must be considered:

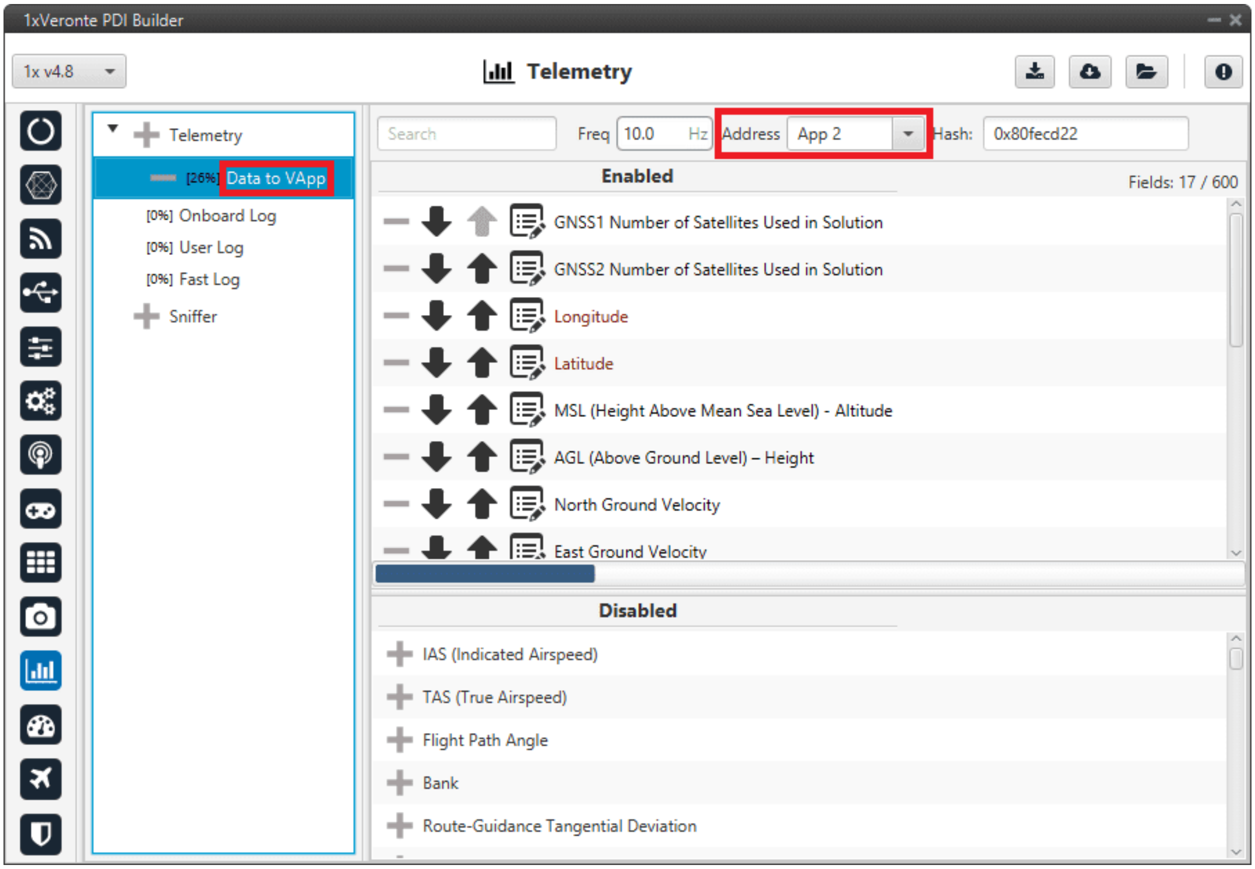
- The gimbal must be configured in the *Gimbal panel*.
- Use the *Gimbal Buttons widget* to command actions to the gimbal.
- Use the *Gimbal Setup widget* to configure some options of the gimbal camera video.
- To view the video recording and/or track directly with the displayed image, the *Iframe widget* is needed.
- Finally, if the user wants to manage the gimbal with a Veronte Ops virtual stick or a USB joystick, the *Stick widget* must also be configured.

Furthermore, it is necessary to configure the following variables in the telemetry vector of the Autopilot 1x in order to stablish a correct communication for commanding between **Veronte Autopilot 1x** ⇒ **Veronte Ops** ⇒ **Gimbal**:

- GNSS2 Number of Satellites Used in Solution
- GNSS1 Number of Satellites Used in Solution
- Longitude
- Latitude

- MSL (Height Above Mean Sea Level) - Altitude
- AGL (Above Ground Level) - Height
- North Ground Velocity
- East Ground Velocity
- Down Ground Velocity
- Heading
- GS (Ground Speed)
- p (Angular Velocity - X Body Axis)
- q (Angular Velocity - Y Body Axis)
- r (Angular Velocity - Z Body Axis)
- Yaw
- Pitch
- Roll

The **Data to Vapp** telemetry vector in the **1x Autopilot** configuration (using **1x PDI Builder** software) should look like this:



Freq 10.0 Hz

Address App 2

Hash: 0x80fecd22

Enabled

Fields: 17 / 600

- GNSS1 Number of Satellites Used in Solution
- GNSS2 Number of Satellites Used in Solution
- Longitude
- Latitude
- MSL (Height Above Mean Sea Level) - Altitude
- AGL (Above Ground Level) – Height
- North Ground Velocity
- East Ground Velocity

Disabled

- IAS (Indicated Airspeed)
- TAS (True Airspeed)
- Flight Path Angle
- Bank
- Route-Guidance Tangential Deviation

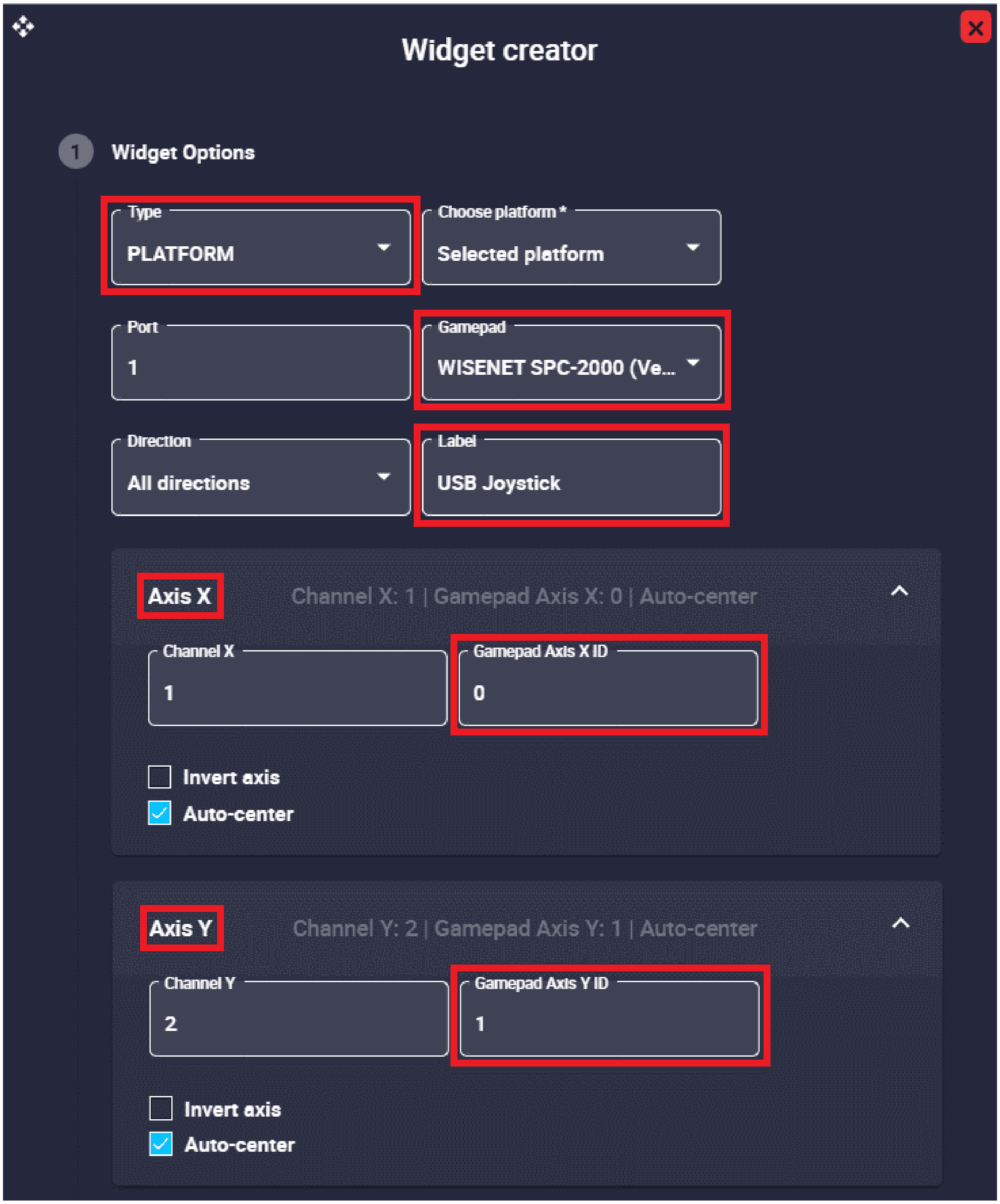
Fig. 2: **Gimbal - Telemetry configuration**

4.2 Stick widget

Veronte Ops is able **to detect USB devices such as joysticks**. The buttons and axes of these devices can be read and configured to send stick information to **Veronte Autopilot 1x**.

Once the steps described in the **Integration examples** section of **1x PDI Builder** manual (Integration examples -> USB joystick) have been performed, configure a **Stick widget** to be connected to a USB joystick. To do so, follow the steps below:

1. Select the **Gamepad (Index)** that corresponds with the USB joystick connected to the PC.
2. And configure the **Gamepad Axis X/Y ID** so that the axes IDs of the virtual stick gamepad correspond to those of the physical joystick.



Widget creator

1 Widget Options

Type: PLATFORM

Choose platform *: Selected platform

Port: 1

Gamepad: WISENET SPC-2000 (Ve...

Direction: All directions

Label: USB Joystick

Axis X Channel X: 1 | Gamepad Axis X: 0 | Auto-center

Channel X: 1

Gamepad Axis X ID: 0

☐ Invert axis

☑ Auto-center

Axis Y Channel Y: 2 | Gamepad Axis Y: 1 | Auto-center

Channel Y: 2

Gamepad Axis Y ID: 1

☐ Invert axis

☑ Auto-center

Fig. 3: **Virtual stick - USB joystick**

Below is an example of how the stick widget works with the previous configuration:

Fig. 4: **Virtual stick - USB joystick movement**

For more information on the configuration of the **Stick widget**, please refer to the *Stick widgets subsection* of this manual.

CHAPTER

FIVE

TROUBLESHOOTING

5.1 Connecting to Veronte Link

In case of having problems to connect with Veronte Link, allow all the content in the browser. To do this in Google Chrome follow the steps:

1. Click on 🔒 → **Site settings**.
2. Click on **Privacy and security** → **Insecure content** → **Allow**.

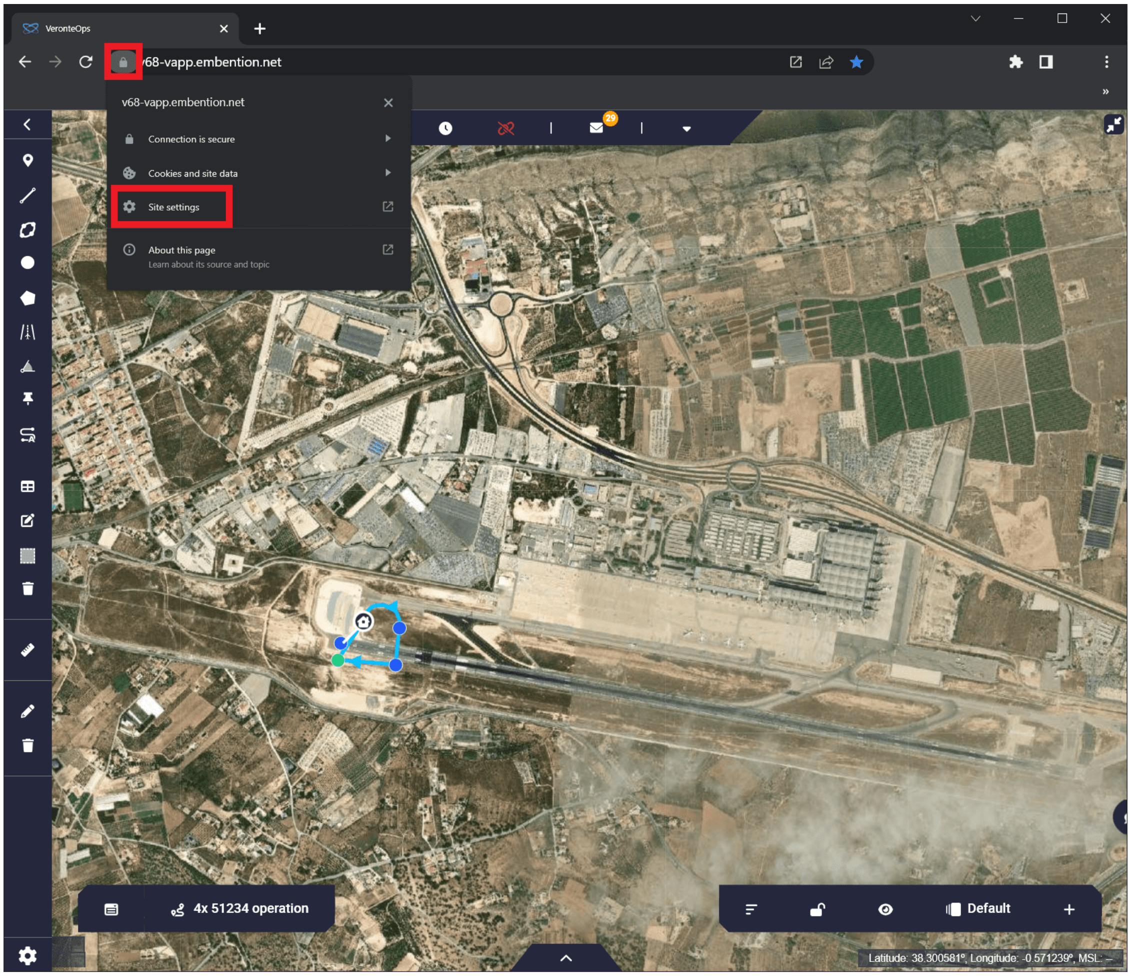
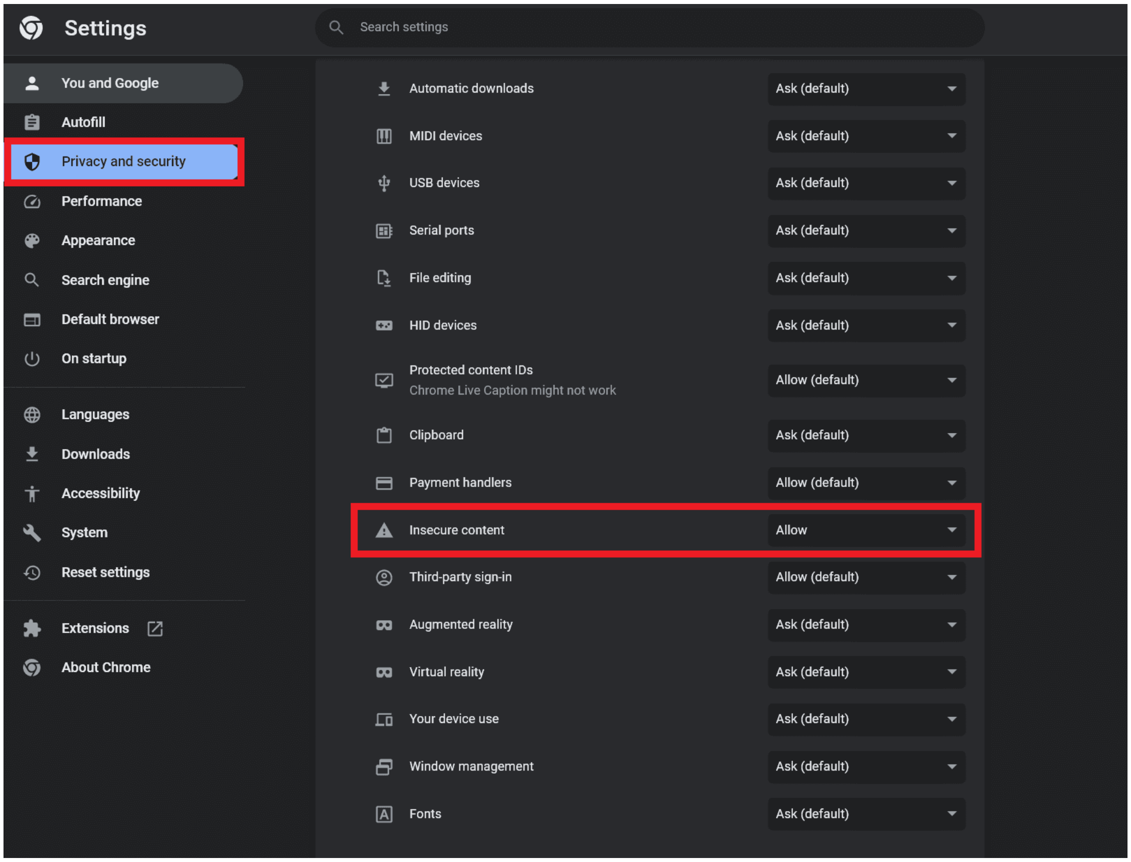


Fig. 1: **Step 1: 🔒 → Site settings**



Automatic downloads	Ask (default)
MIDI devices	Ask (default)
USB devices	Ask (default)
Serial ports	Ask (default)
File editing	Ask (default)
HID devices	Ask (default)
Protected content IDs Chrome Live Caption might not work	Allow (default)
Clipboard	Ask (default)
Payment handlers	Allow (default)
Insecure content	Allow
Third-party sign-in	Allow (default)
Augmented reality	Ask (default)
Virtual reality	Ask (default)
Your device use	Ask (default)
Window management	Ask (default)
Fonts	Ask (default)

Fig. 2: **Step 2: Privacy and security → Insecure content → Allow**

5.2 Error when changing phase

When changing phase, an **error** may occur so that the phase change does not take place and also the *current phase identifier* is **colored red** (the phase that appears is the one the platform was in before the phase change was attempted):

Fig. 3: **Veronte Panel - Changing phase error**

The reason for this error depends on the user's goal:

- **During simulation or simple test**

  If this error occurs while the user is **running simulations or simple tests without all sensors connected**, it is most often because Veronte Autopilot 1x has not been configured in **PDI Mode**.

  For more information on PDI Mode, visit the PDI Mode description of the **1x PDI Builder** user manual.

- **During flight test or operation**

  If this happens when the user is **not in PDI mode** (e.g. because the user is operating with the configuration finished and all sensors connected), it may be due to one of the following reasons:

  - **System bit** is in **error mode** (not OK).

A list of all errors that can cause this bit to be set can be found in the **1x software manual** → Activation System Error bits section.

- **Navigation attitude could not be initialized**. For more information, see *Navigation does not start section*.

5.3 Navigation does not start

To start the navigation, the following requirements must be met:

- Correct **IMU measurements**.
- The **yaw** must be initialized with magnetometer measurements or with an **yaw initialization command**. To do the latter, see *Calibrate Yaw section - Operation panel* of this manual.