Veronte FDR

Release 6.14/1.0

Embention Sistemas Inteligentes, S.A.

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Contents

Scope of Changes

- Version 1.0
  - Added:
    - First version issued.

Quick Start

Veronte Autopilot 1x and **4x** register automatically the desired information in register files, named as "log files".

> ⓘ **Note**
>
> Fast logs are related to the same session. In addition, each fast log entry will be appended to the end of the previous one.

Veronte FDR is an application used to download and analyze log files from Veronte autopilots. It is available as both a web version and a desktop executable.

These log files allow the user to create mission reports, that contain basic information (like mission duration, UAV ID, configuration name, date, etc.) and any relevant events, along with a timestamp.

This information can be configured reading the Telemetry section of the **1x PDI Builder** user manual.

System Requirements

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

Minimum requirements

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

Recommended requirements

- CPU: 12th Gen Intel(R) Core(TM) i7-12700H 14 cores up to 4,70 GHz
- RAM: 32 GB
- STO: 1 TB SSD M.2 NVMe PCIe

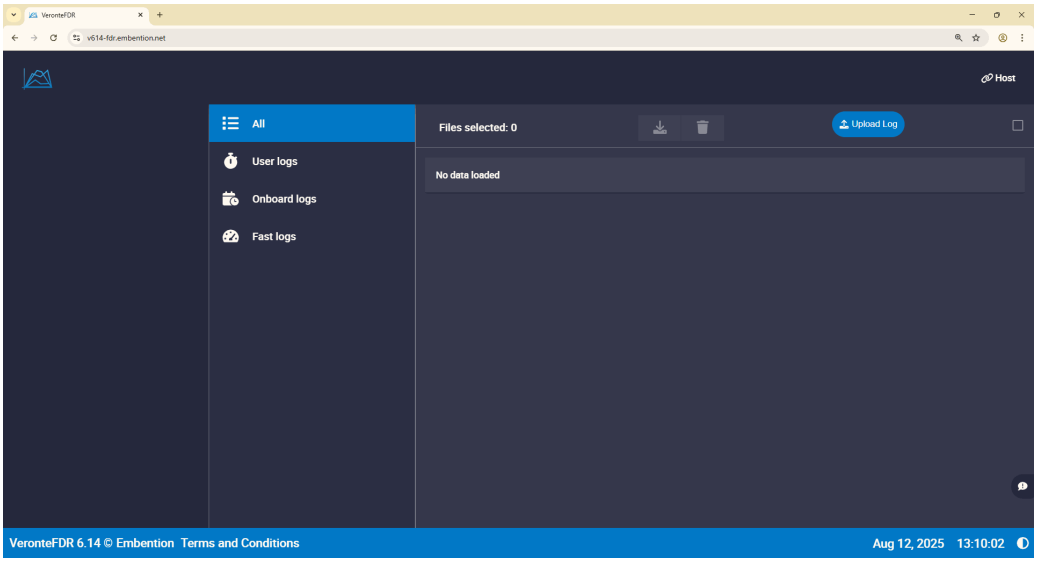
Download and Installation

There are 2 ways available to work with Veronte FDR: as a website app for quick online access or installing it through an executable (Desktop Application), which is required for offline use.

> **⚠ Warning**
>
> The ability to install Veronte FDR as a Progressive Web App (PWA) for offline use has been discontinued. Users who previously used the PWA version are strongly encouraged to switch to the official Desktop Application for offline functionality.

Website

To access the online version of the application, simply click on the following link: https://v614-fdr.embention.net/.



Veronte FDR in browser

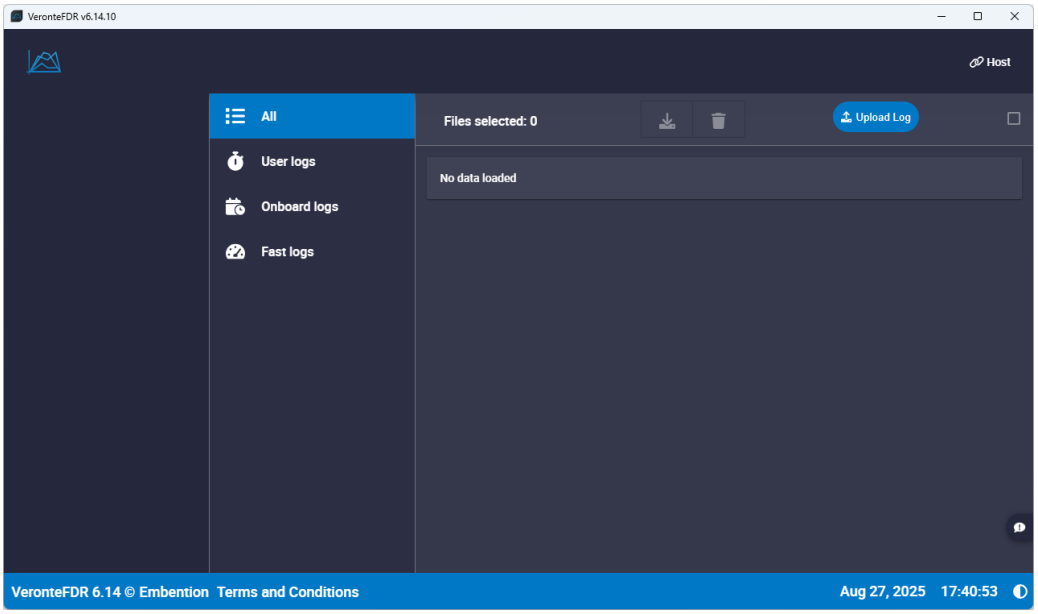
As it is a web application, updates will be done on their own and will appear in the changelog.

Desktop Application

If users wish to work with the executable app for **offline access**, **Veronte FDR** software is available on the **Veronte Toolbox** platform for downloaded and

installation. For more information, please refer to the Veronte Toolbox user manual.

A personal account is required to access **Veronte Toolbox**; create a Ticket in the user's **Joint Collaboration Framework** and the support team will create it for you.



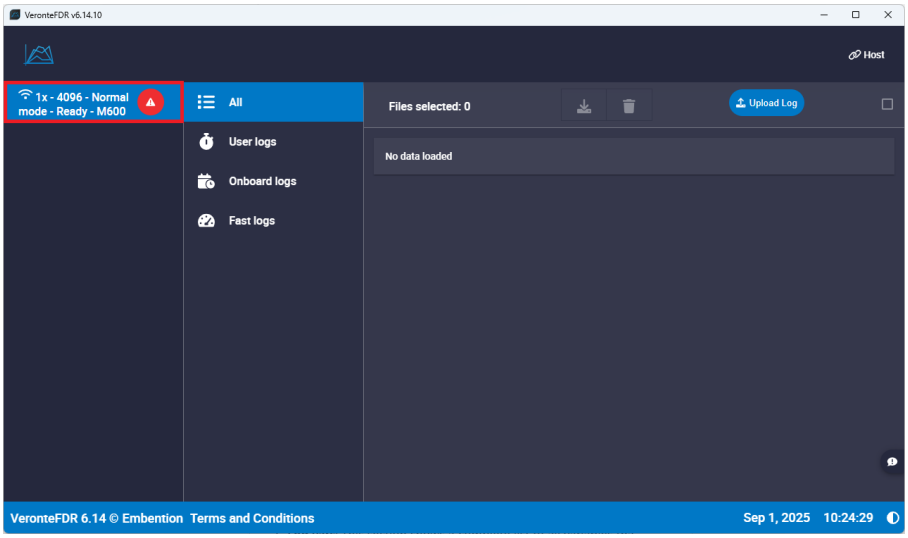
Veronte FDR as desktop application

Operation

First of all, connect the **Autopilot 1x** or **4x** to the computer using **Veronte Link**. Read the Veronte Link user manual to know more.

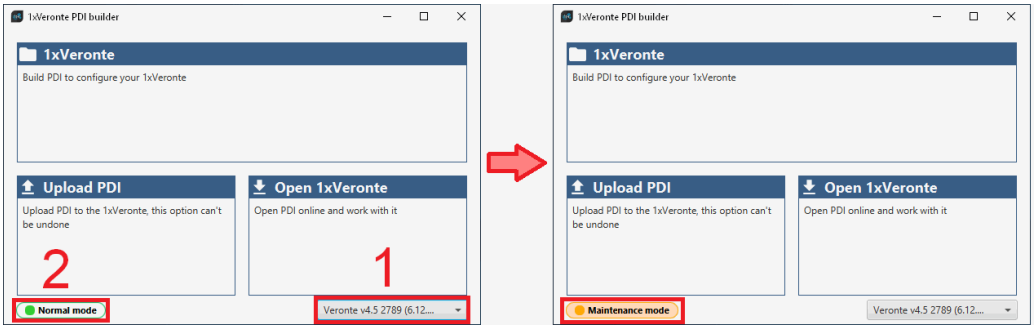
Once **Veronte Autopilot** has been connected, it must be **set to maintenance mode** to allow log file access.

The easiest way to do this is directly from the Veronte FDR application. The user can switch to maintenance mode by clicking on the button.

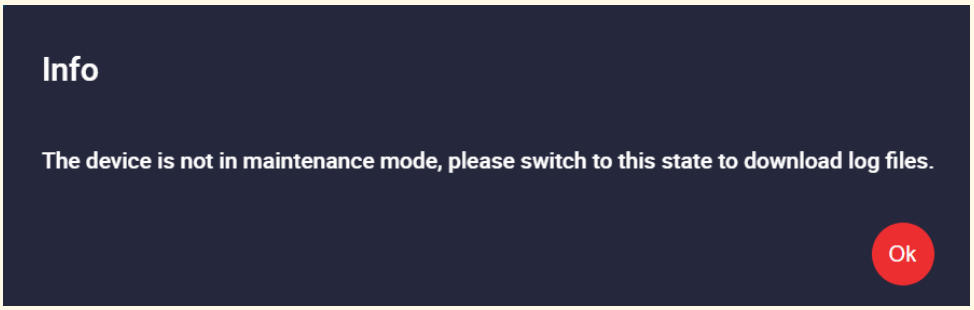


Setting maintenance mode

Alternatively, it is also possible to set maintenance mode using **1x PDI Builder** by selecting the device (1) and clicking on the status bar (2).



Setting maintenance mode

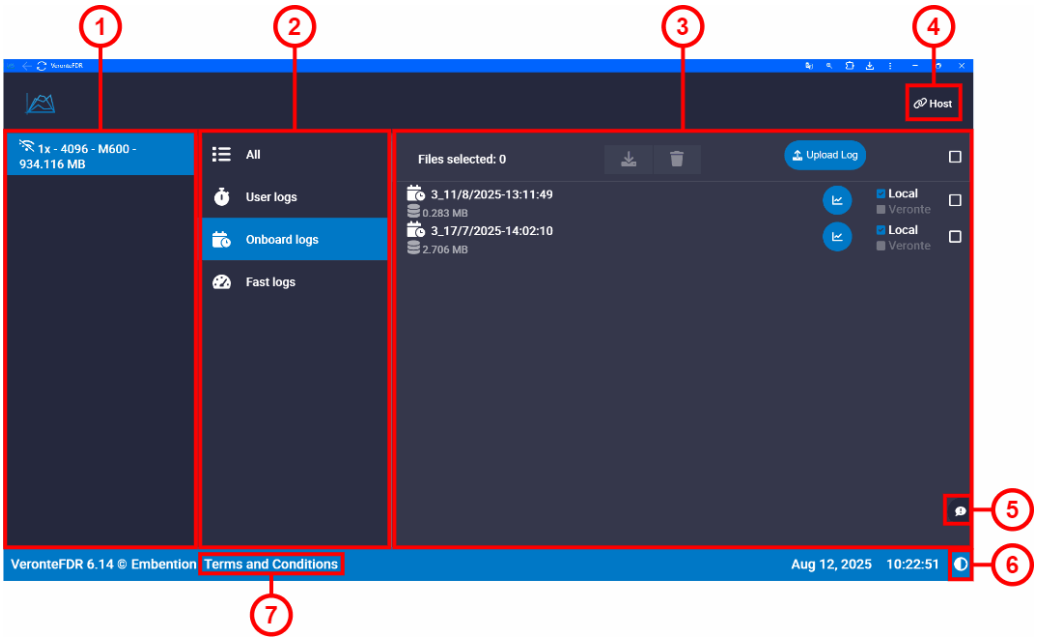
> ⚠ **Warning**
>
> The error message below will pop up when trying to download log files if the autopilot is not properly set to maintenance mode:
>
> 
>
>
> **Maintenance mode - Warning panel**
>
> To know more about maintenance mode, refer to the Maintenance mode - Troubleshooting section of the **1x PDI Builder** user manual, which also explains other ways to set the autopilot to maintenance mode.

Once the autopilot is connected and set to maintenance mode, you can proceed with the following sections:

- Graphical User Interface: Learn how to navigate the interface to download and manage log files.
- Log Analysis Panel: Discover how to analyze flight data, visualize the route on a map, and create custom charts with the recorded variables.

Graphical User Interface

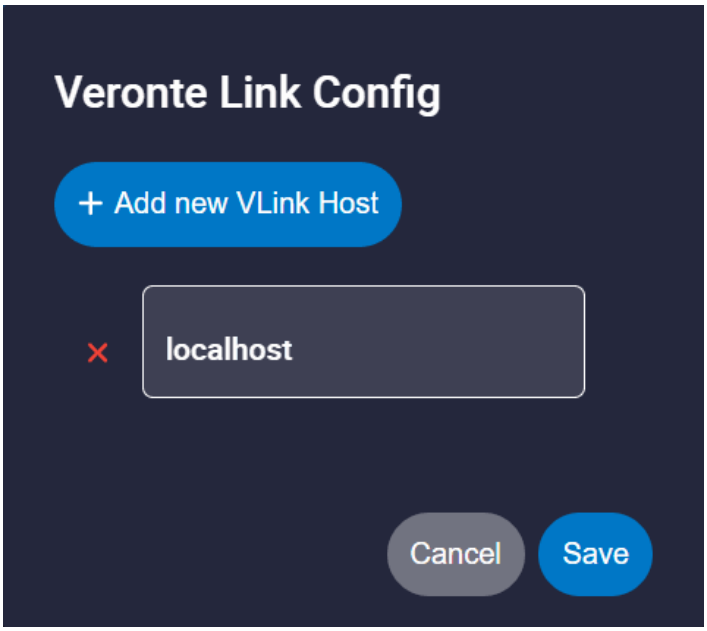
When opened **Veronte FDR**, the application will display an interface similar to the one below. This interface is composed of the following areas:



Veronte FDR - Sections

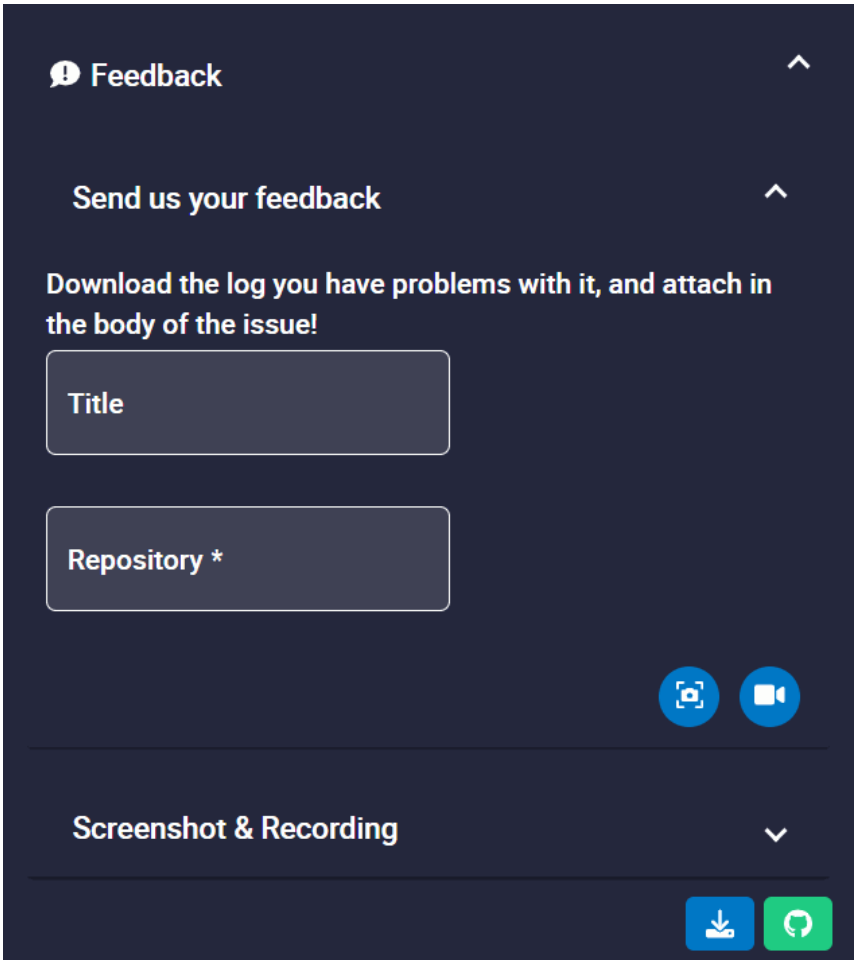
1. **Veronte Autopilots panel**. Select the Veronte Autopilot to access its logs. Autopilots can be connected or disconnected .
2. **Type of logs panel**. Select a log type to display them. Select **All** to display all types of logs.

   To know more about logs, read the Telemetry - Telemetry section of the **1x PDI Builder** user manual.
3. Log Files Panel. As shown in the image, here all records of the log type selected in **Type of logs panel** are displayed in a list.
4. **Host**. It allows connecting to the local IP address (localhost) or to another desired IP address. To do it, click on **Add new VLink Host**, write the IP address and click on **Save**.



Host window

5. **Feedback**. After clicking here, the following window will pop up:

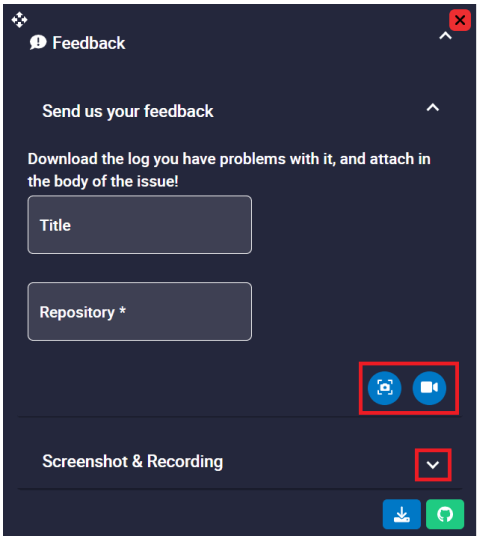


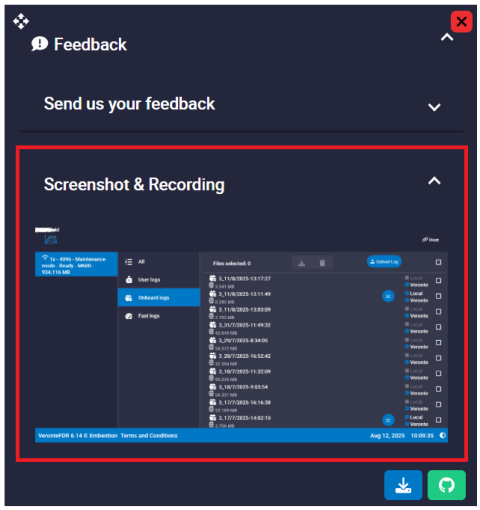
Users can report a problem they have encountered by creating an issue in their own **Joint Collaboration Framework**.

> **Note**
>
> The user's '**Joint Collaboration Framework**' is simply a **Github repository for each customer**.
>
> In case of having any questions about this, please see Joint Collaboration Framework manual or contact sales@embention.com.

In addition, clicking on will take a snapshot or will record a video, which can be added as explanatory information to the issue.

When a snapshot or video is taken, it can be visualized in the Screenshot & Recording tab.



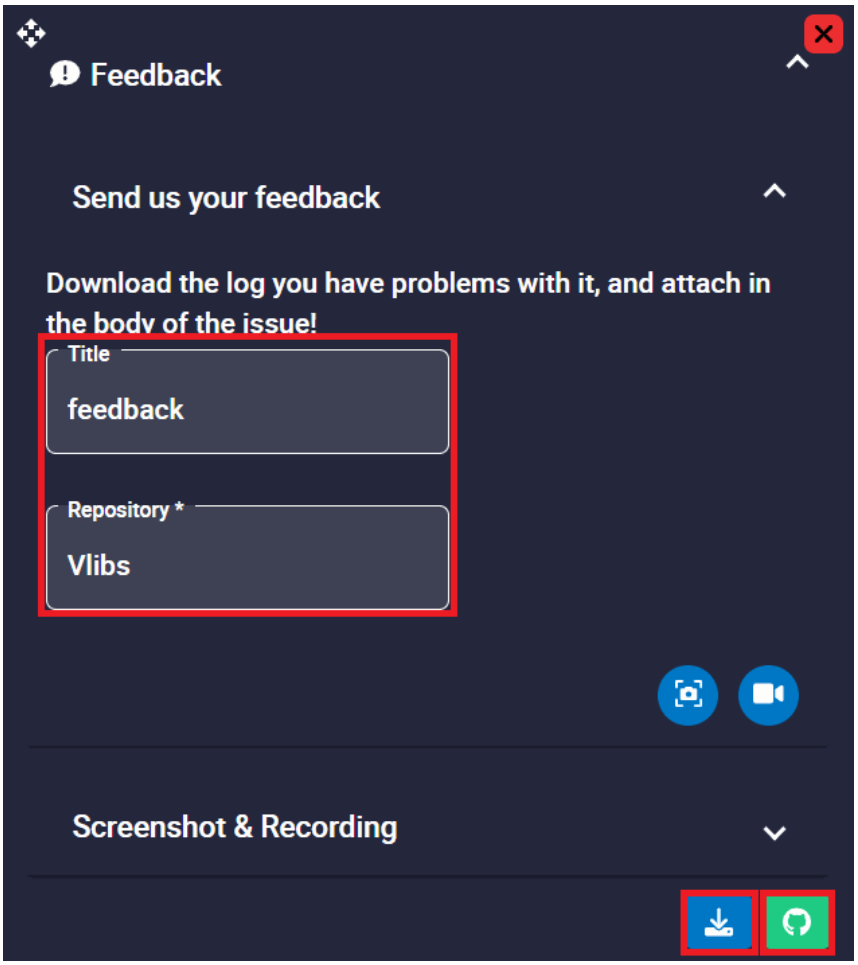


Screenshot & Recording tab

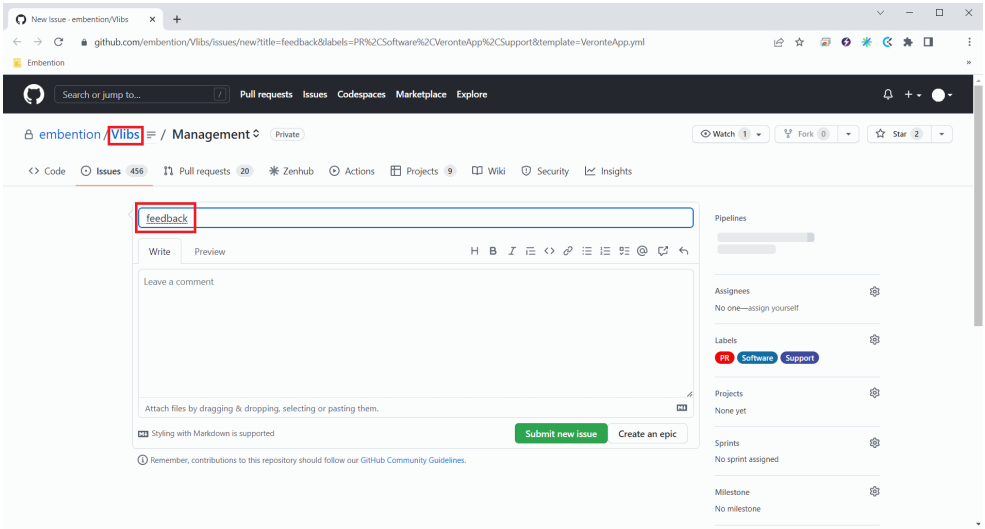
Clicking on the **Download** button downloads a zipped folder with the data of the operation to easily identify the problem.

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:



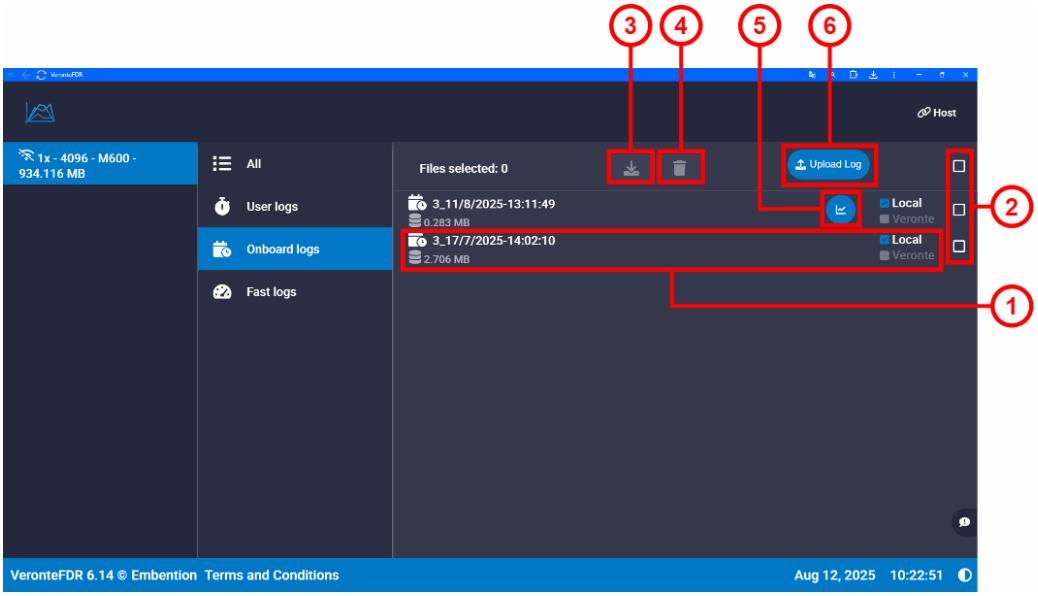
Feedback example - Feedback menu



Feedback example - Issue created in Github

6. **Light/dark mode**. It changes the display mode of the interface.
7. **Terms and Conditions**. Users can consult the End User License Agreement (EULA).

Log Files Panel

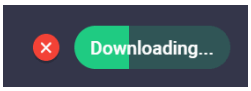


Log Files Panel

1. **Register**: Each log has a file name with the following format that allows to be identified `[Log type]_[Log started date]-[Log started time]`.
   Where each Log type value refers to 2=User log, 3=Onboard log or 4=Fast log.
   In addition, each log has two checks:
   - **Local**: Indicates that the log is located on the computer.
   - **Veronte**: Indicates that the log is located on the connected **Veronte Autopilot**.

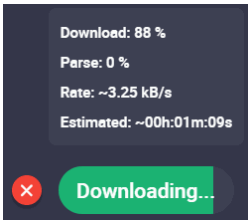
   > **Note**
   > The log can be located in both locations, Local and Veronte.

2. **Selection boxes**: Select the logs to be downloaded or deleted. Checking the first box will select all logs.
3. **Download**: Selected log files can only be downloaded as **CSV files** clicking on the icon.
   The download progress is displayed on the same line as the log currently being downloaded, where it can be canceled by pressing on .



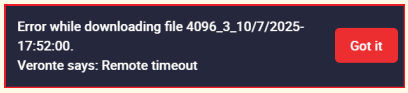
Download progress bar

The download data progress can be viewed by hovering the cursor over the progress bar.

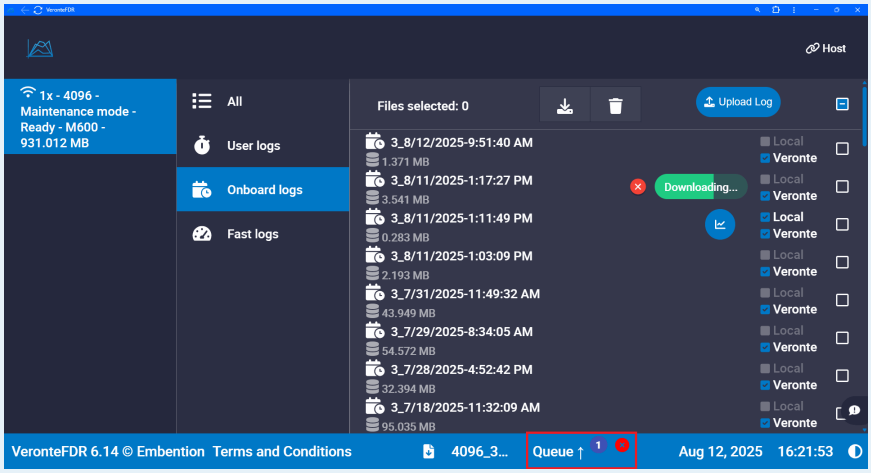


Download progress data

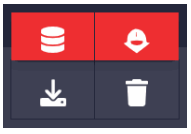
> ⚠ **Warning**
>
> The following error message will appear if the connection with Veronte Autopilot is lost during the download process. In this case, user must repeat the downloading process.



Download - Error message

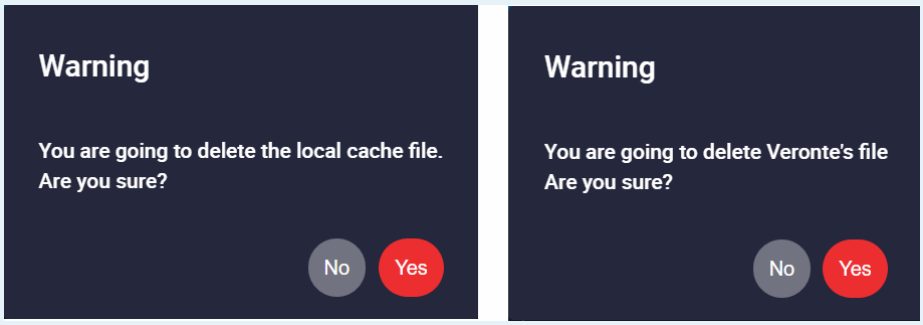
> **Note**
>
> Please note the following download behaviors:
>
> - **Download queue:** Although it is not possible to download multiple files simultaneously, when you select multiple log files and click the download button, they will be added to a queue. The system will then download them sequentially, one after another.
>
> 
>
>
> - **Single autopilot limitation:** Only logs from one autopilot can be downloaded at a time. If multiple autopilots are connected, the user must complete the download process for one device before starting the download for another.

4. **Delete**: When clicking on this button, the user has two options:
   -  clicking this button will delete the log files located on the computer.
   -  clicking this button will delete the log files located on Veronte Autopilot.



Delete options

> **Note**
>
> The user must confirm these actions by accepting a confirmation panel. Panels below correspond to the confirmation of the **local file deletion** and the **autopilot file deletion** respectively:



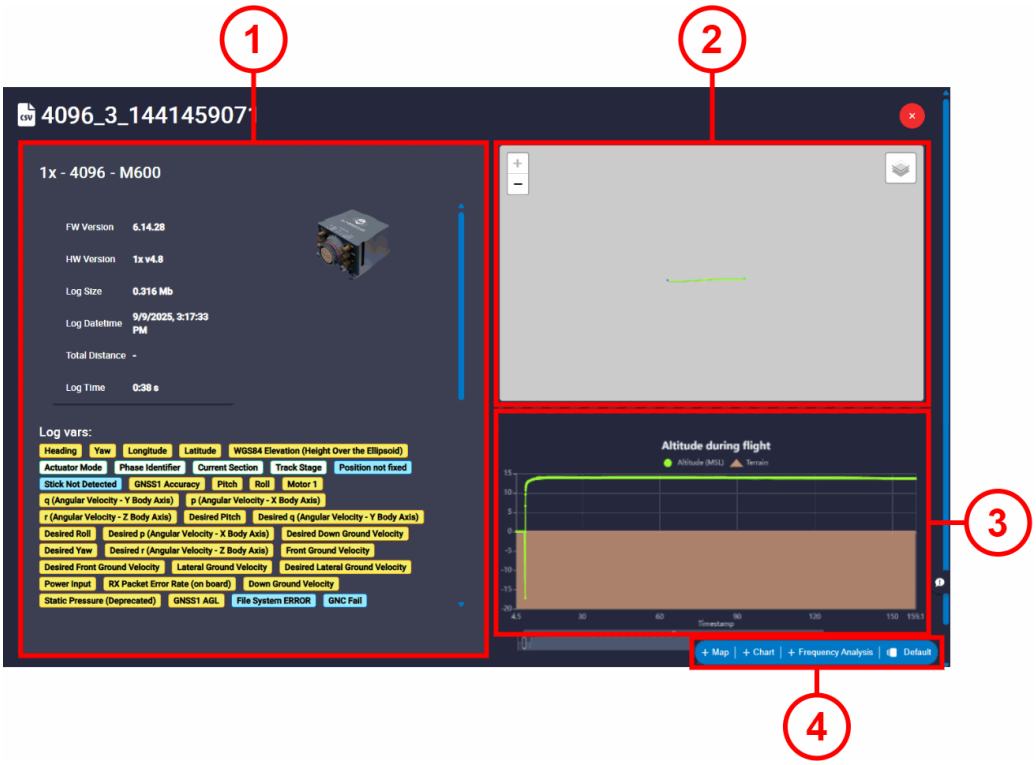
Delete - Warning Panels

5. **ViewLog functionality**: This button appears once a **log** has been **downloaded**. This functionality allows users to analyze flight data. Clicking on it will display the Log Analysis Panel.
6. Upload Log **Upload Log**: The user can upload logs in `.csv` format from previous sessions stored locally. This also includes logs generated by the **Veronte Telemetry CSV** application (postflight). When the log is uploaded, the Log Analysis Panel will be displayed automatically.

Log Analysis Panel

Once a log is selected for analysis, the system displays the main analysis interface. This interface is divided into the following sections:

> **Note**
>
> Remember that the log file name has the following format: `[Veronte Autopilot Serial Number]_[Log type]_[Timestamp]`.
>
> Where each value of Log type refers to: 2=User log, 3=Onboard log or 4=Fast log.



Log Analysis Panel

1. **Summary**:
   - Veronte Autopilot information formatted as `[Veronte Autopilot unit]-[Serial Number]-[Vehicle name]`, Veronte Autopilot unit can be **1x** or **4x**.
   - FW / HW Version.
   - Log Size.
   - Log Date time: Log date and time in which the log started to be recorded.
   - Total Distance: If the variable Total Flight Distance is in the selected log, its value is displayed here.
   - Log Time: Total duration of the log.
   - **Log vars**: A complete list of all variables that have been recorded by the system during the flight is shown. To facilitate quick identification of the nature and accuracy of the data, each variable is color-coded according to its data type:
     - **Yellow**: Corresponds to 32-bit variables, **Real Variables (RVar)**.
     - **Green**: Corresponds to 16-bit variables, **Integer Variables (UVar)**.
     - **Blue**: Corresponds to **BIT Variables**.
     - **Gray**: Corresponds to 64-bit variables, **Feature Variables**.

2. **Flight path panel**: This panel displays the flight path recorded in the log on a map. The route is plotted in 2D using the `Latitude` and `Longitude` from the log.
3. **Altitude graph**: This graph plots the `Altitude (MSL)` over time (`Timestamp`) to provide 3D information about the recorded route.
   The graph is synchronized with the flight path panel; hovering the cursor over a point on the graph will highlight the corresponding location on the map, and vice versa.
4. Elements Toolbar: This toolbar allows adding different elements to analyze the variables of the recorded log.

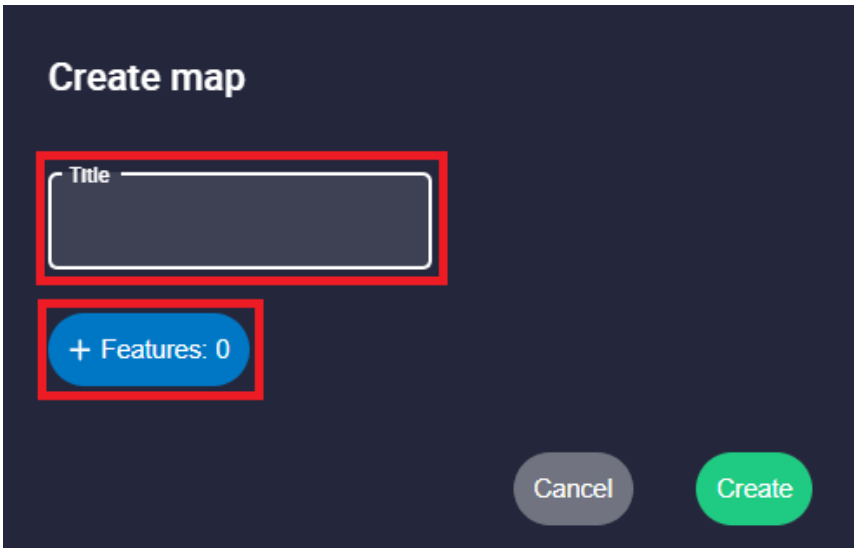
Elements Toolbar

This toolbar allows users to create four different analysis elements:

- Map: This interface allows users to display information (latitude, longitude and altitude) from **feature** variables on an interactive map and graph.
- Chart: This panel allows users to create and configure custom charts to visualize log variables.
- Frequency Analysis: This interface displays the frequency analysis of a selected variable. This is useful for identifying vibrations, noise, or other cyclical patterns in the data.
- Workspace: **Veronte FDR** supports saving analysis layouts as workspaces.

Map

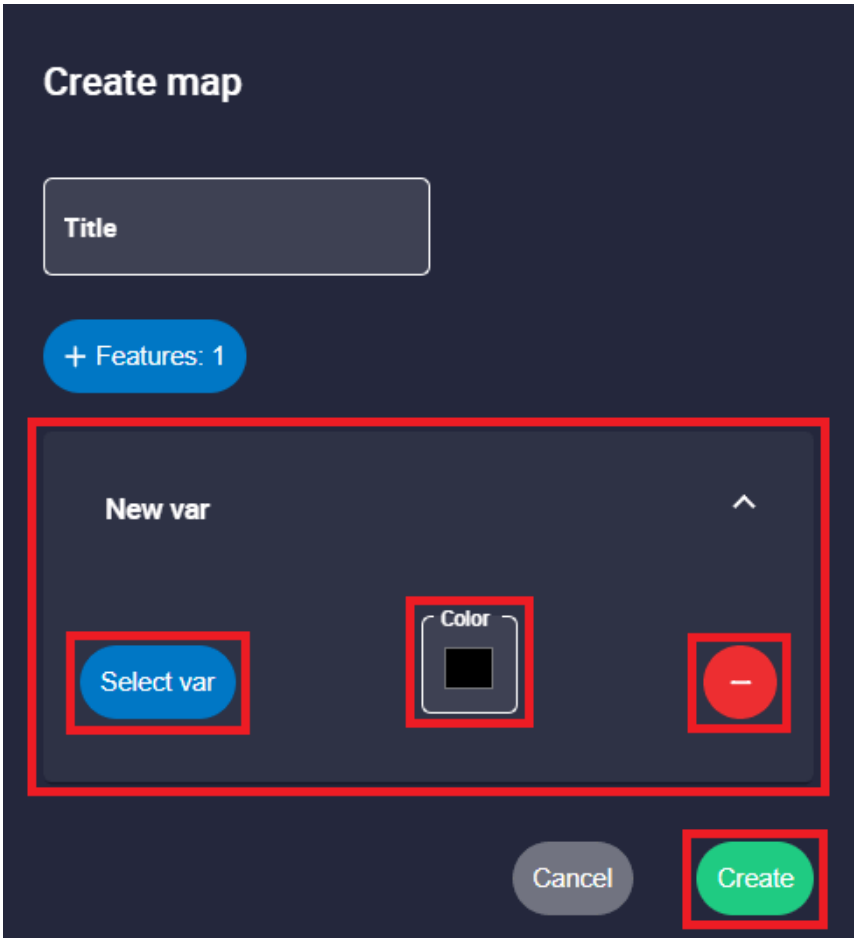
Click on `+ Map` to add a map element, then its configuration menu appears:



Map settings

It has the following configuration parameters:

- **Title**: Users can add a custom name to this map element.
- + Features: 0 button: **Feature variables** shown in the map. Users can add as many variables they wish to represent in the same map. The appearance of these variables in the map can be configured below:



Map settings - Feature variables

  - **Select var**: Users can select the desired feature variable from the recorded log to be displayed.
  - **Color**: This is the color in which the line with the information of the variable is drawn. By default, the first variable is drawn in blue, the second in green, the third in yellow, the fourth in red, etc.
  - −: Clicking here the user can delete this variable.

  After selecting all the desired variables, click the **Create** button to generate the map element. It will be displayed in the lower section of the log analysis interface.

Once the map element has been created, users can access its configuration menu again by clicking on  or close this element by clicking on  .

The map element consists of two parts: a **map** on the left and a **graph** on the right:

Map element

- **Map**: This map plots the 2D information (latitude and longitude) for **all** the selected feature variables.
- **Graph**: This graph displays the altitude information over time for a single feature variable at a time. This variable is the one selected in the **Displayed feature** option.

Chart

Click on `+ Chart` to add a chart element, then its configuration menu appears:

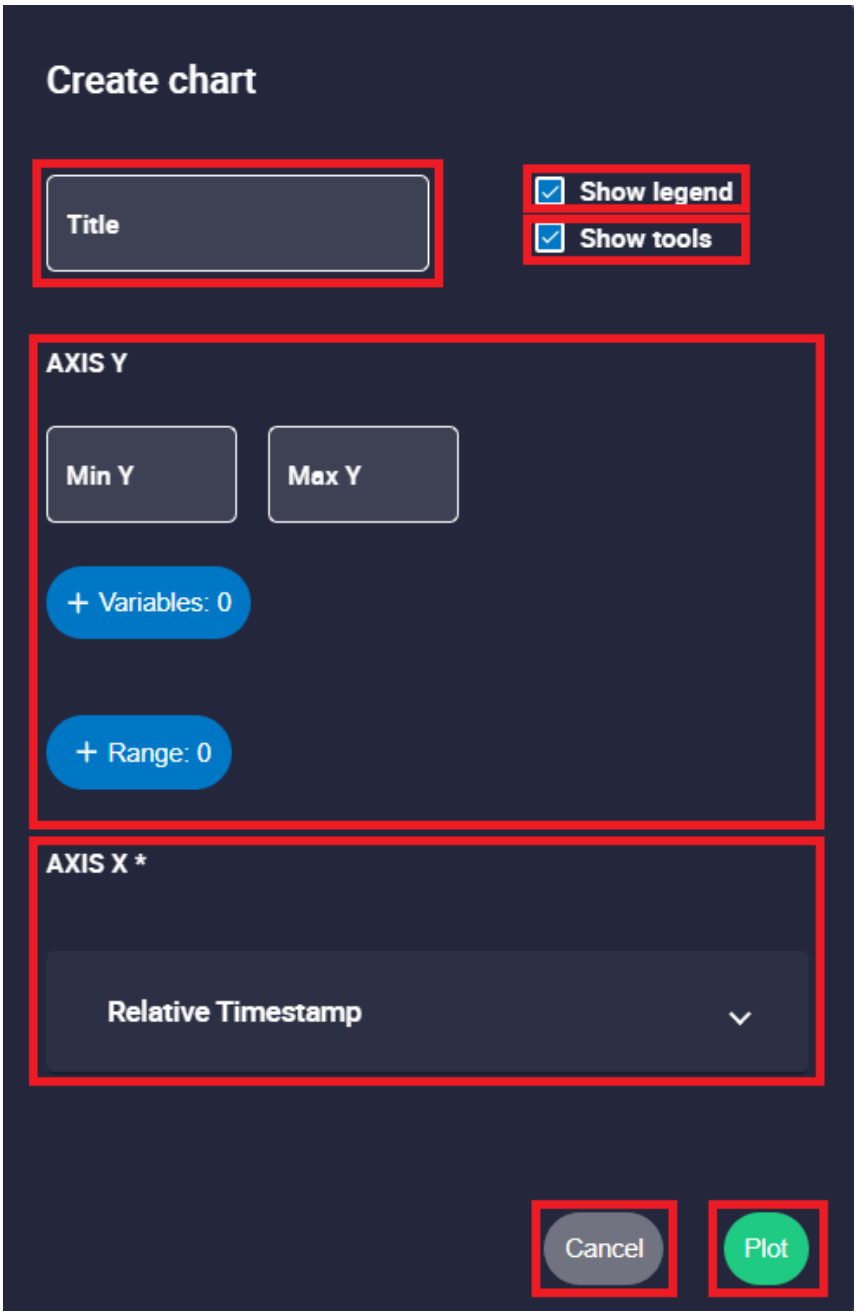


Chart settings

Users must set the following parameters:

- **Title**: Users can entered a custom name to this chart element.
- **Show legend**: Show/Hide the chart legend that identifies each plotted variable.
- **Show tools**: This option enables or disables the chart's interaction tools.
- **AXIS Y**:

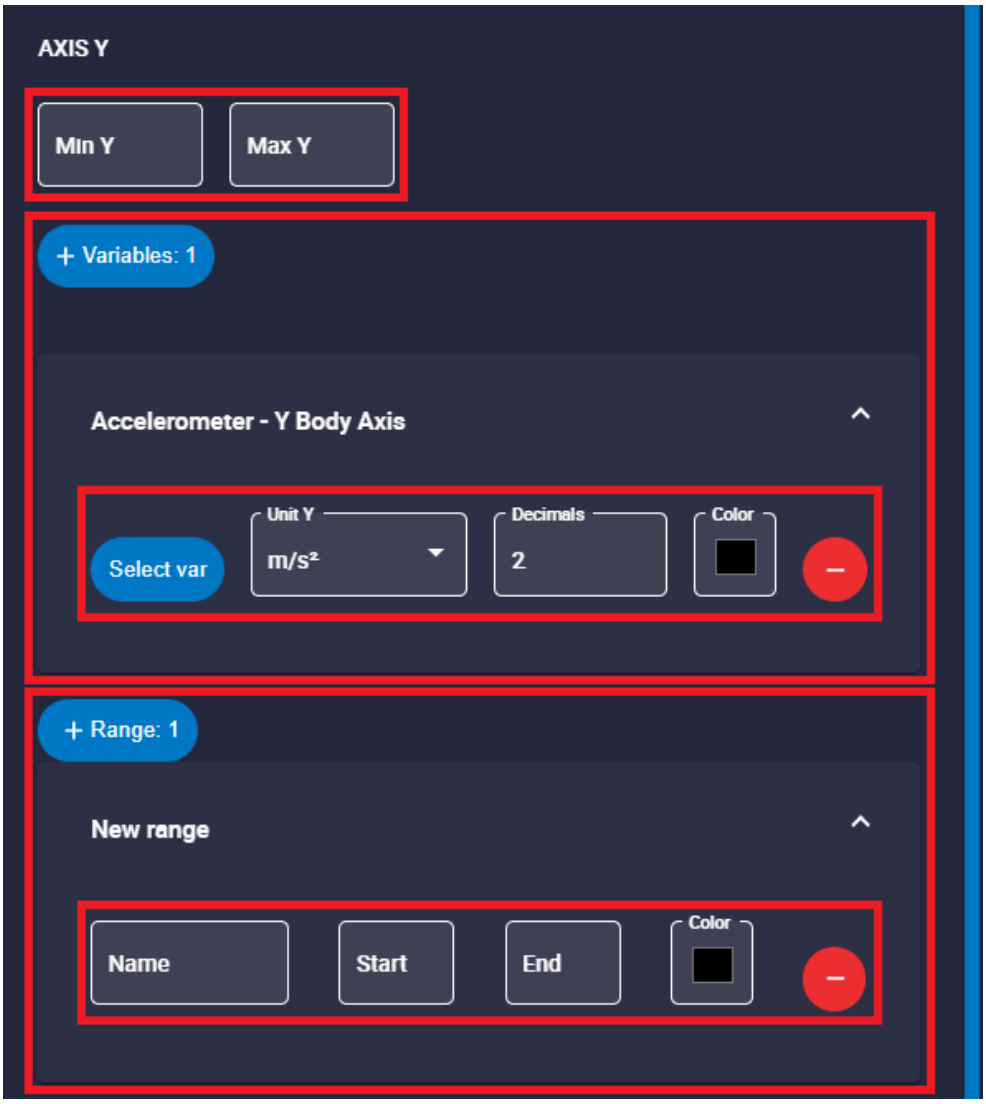


Chart settings - AXIS Y

- **Min / Max Y**: Minimum and maximum Y axis of the chart can be adjusted manually. If no value is specified, the Y axis of the chart will be adjusted automatically.
- + Variables: 0 button: Add the variables that will be displayed on the chart.
  - **Select var**: Users can choose any **real, integer or bit variable** from the recorded log to be displayed on the chart.
  - **Unit Y**: Unit of measurement of the displayed variable.

    > ⓘ **Note**
    > This parameter is only available with Real variables.

  - **Decimals**: Number of decimals displayed for the selected variable.

> **ⓘ Note**
> This parameter is 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.
- −: Click to delete this variable.

◦ + Range: 0 button: Enables the user to add different ranges to the chart, which are useful for highlighting operational limits or zones of interest.

- **Name**: An identifying name for the range can be set.
- **Start / End**: Defines the start and end values of the range.
- **Color**: Sets the color for this range.
- −: Click to delete this range.

• **AXIS X**:

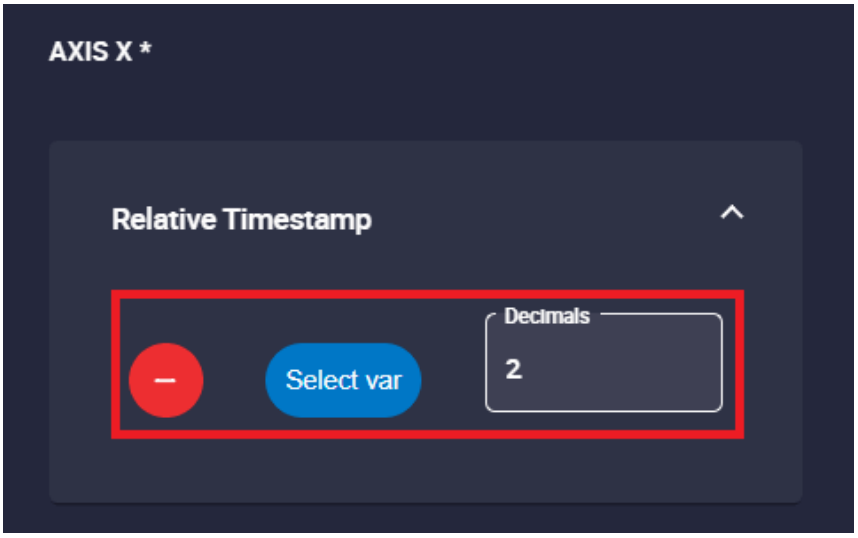


Chart settings - AXIS X

◦ **'Name of the selected variable'**: By default, **Relative Timestamp** is selected to display data as a function of elapsed time.

- −: Deselect the current selected variable.
- **Select var**: Users can choose any **real, integer or bit variable** from the recorded log to be represented on the X-axis.
- **Decimals**: Number of decimals displayed for the selected variable.

> **ⓘ Note**
> This parameter is only available with Real variables.

When the chart is configured, click the Plot button to generate the chart element. It will be displayed in the lower section of the log analysis interface.

Once the chart element has been created, users can access its configuration menu again by clicking on or close this element by clicking on .

This panel is composed of two main areas, a **chart display area** on the left and the **quick settings panel** on the right:

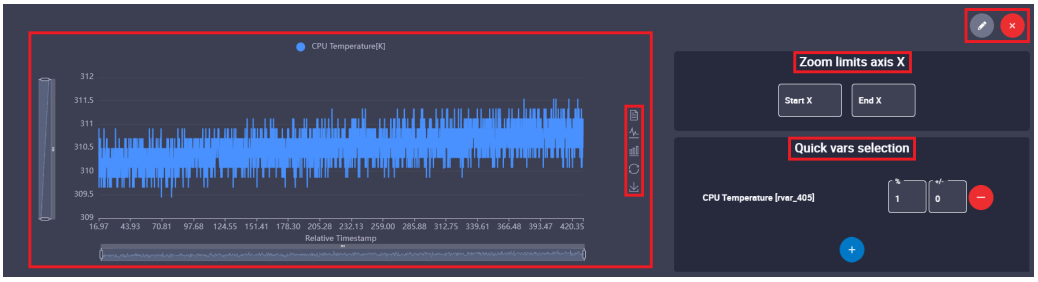


Chart element

- **Chart display**: This area shows the graphical representation of the selected variables. In this example, `CPU Temperature[K]` is represented as a function of time (`Relative Timestamp`).
  In addition, users can interact directly with the chart using tools provided in the toolbar located to the right of the chart:
  - **Data View**: Lists in a table the exact numerical values of the data represented graphically.
  - / **Swicth to Line/Bar Chart**: Switch between line and bar representations.
  - **Restore**: Reset the view of the chart to the default zoom and scale.
  - **Save as Image**: It is possible to save the graph as a static image, for example to generate reports.

> **Note**
>
> Furthermore, the user can inspect specific data points in two ways:
>
> - Hovering the cursor over the chart displays a tooltip with the exact X and Y values of that point.
> - Clicking directly on a plotted data point leaves a **cursor** (tooltip) open, showing its exact X and Y values. This behavior applies **only when clicking directly on a represented data point**, not on the line segment between two points. Note that, if users refresh the application, these cursors will disappear.

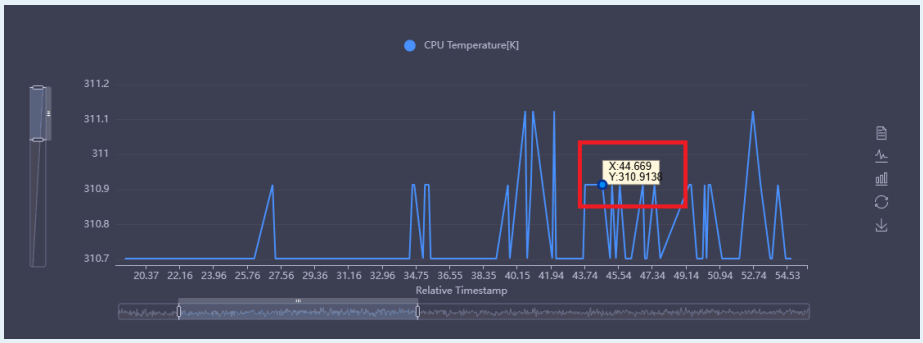
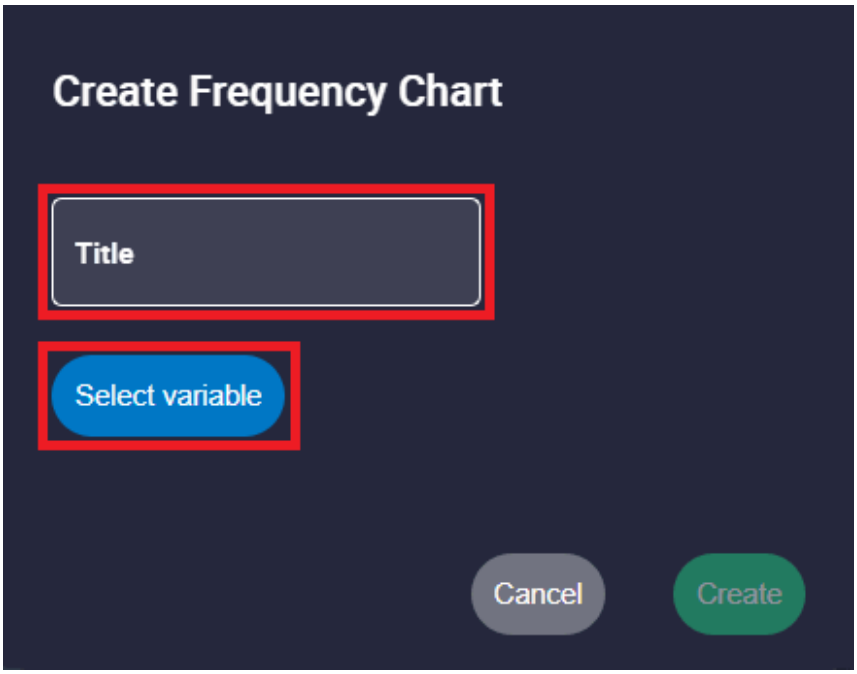


Chart element - Cursor

- **Quick settings panel**: This is a panel for making quick adjustments to the chart:
  - **Zoom limits axis X**: This option allows the user to define a more specific, narrow interval for the X-axis.
  - **Quick vars selection**:
    - Multiply variable (%): This parameters is applied to the values of the selected variable as a scale factor. Default value: 1.
    - Offset variable (+/-): This parameter adds an offset to the values of the selected variable. By default, 0.

Frequency Analysis

Click on `+ Frequency Analysis` to add a frequency chart element, then its configuration menu appears:



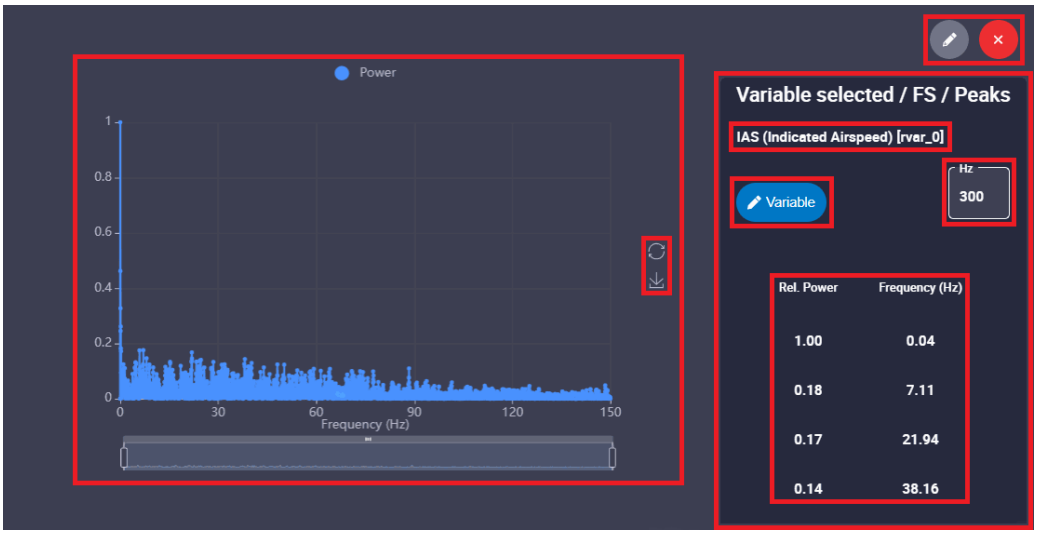
Frequency Chart settings

- **Title**: Users can entered a custom name to this frequency chart element.
- **Select variable**: Users can choose any **real, integer or bit variable** from the recorded log to be analyzed.

Once the desired variable is selected, click the **Create** button to generate the frequency analysis element. It will be displayed in the lower section of the log analysis interface.

Once the frequency analysis element has been created, users can access its configuration menu again by clicking on  or close this element by clicking on  .

This element consists of two parts: a **graph** on the left and a **settings panel** on the right:



Frequency Analysis element

- **Frequency chart**: This area shows the frequency analysis representation of the selected variable. The **Relative Power** is represented as a function of **Frequency**.
  In addition, users can interact directly with the frequency chart using tools provided in the toolbar located to the right of the chart:
  - **Restore**: Reset the view of the frequency chart to the default zoom and scale.
  - **Save as Image**: It is possible to save the graph as a static image, for example to generate reports.

> **Note**
> As in the previous Chart element, the user can inspect specific data points by hovering over the data points to display a tooltip with the exact Frequency and Power values, or by clicking on them to keep the **cursor** (tooltip) open with these values.

- **Settings panel**: Provides details about the analysis and allows quick modifications:
  - Name of the variable being analyzed.
  - **Variable button**: Allows users to select another variable from the log for the frequency analysis.
  - **Sampling frequency**: Set the desired sampling frequency, default 300 Hz.

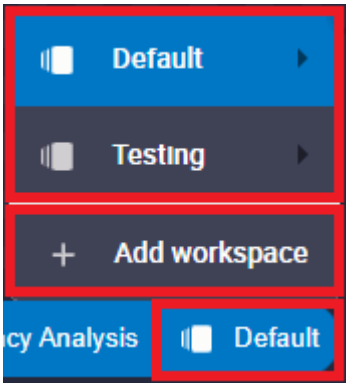
- **Peaks**: This table automatically lists the most prominent frequency peaks found in the data. For each peak, it shows the **Rel. Power** (Relative Power) and the exact Frequency (Hz) where it occurs.

Workspace

To improve efficiency, **Veronte FDR** supports saving analysis layouts as workspaces. This ensures that user-defined charts, maps, and visual preferences are preserved across sessions and applied automatically to any new logs loaded into the system.

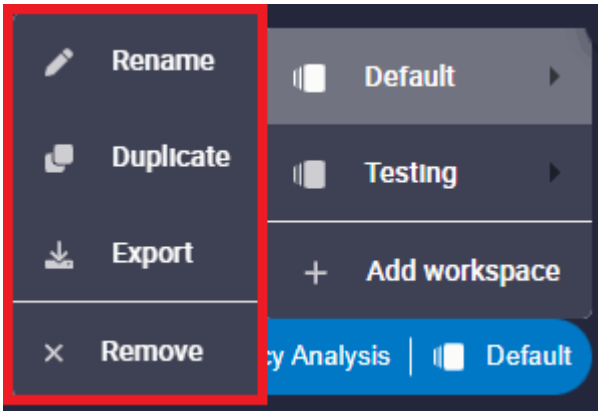
In addition, it is possible to create different workspaces that are useful for changing the elements/variables displayed depending on the purpose of the analysis.

By clicking on the name of the currently active workspace, a list of all workspaces loaded in **Veronte FDR** will appear. In this list, the current workspace is shown in blue.



Workspaces

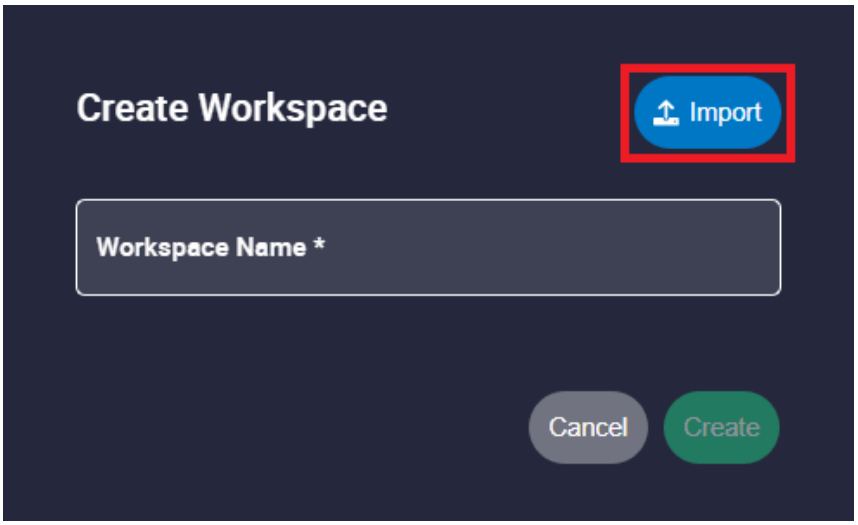
- **List of workspaces**: The following options are available for each workspace:



Workspaces options

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

- **Add workspace**: The user can choose between adding an empty workspace or importing one from the local storage, which has been previously exported. To import a workspace, the format file must be a `.fdr`.



Add workspace

Software Changelog

This section presents the changes between versions of **Veronte FDR** application.

6.14

This section presents the changes between the previous app version **v.6.12** and **v.6.14**.

Added

- A button has been added to switch Veronte Autopilots to maintenance mode directly from the interface.
- A button has been added to upload local (offline) log files to view them without saving them to the database.
- A "ViewLog" functionality has been added, allowing detailed analysis of flight data.
  - A complete list of all variables recorded by the system during the flight is displayed.
  - Flight path panel: the route of the recorded log is plotted in 2D (longitude and latitude)
  - Altitude graph: allows the user to view the altitude (MSL) of the route of the recorded log.
  - Create map element: allows the user to view information from several selected **feature** variables simultaneously on a single map.
  - Create chart: allows users to create and configure custom charts to visualize log variables.
  - Frequency Analysis chart type.
  - Workspaces can now be created, managed, saved, imported, and exported to preserve analysis layouts.

Removed

- Progressive Web App (PWA) compatibility has been removed.
- The "Launch" button and its associated menu have been removed.

- The option to download logs in binary format has been removed; only CSV is now available.

Improved

- Corrected download for large logs in both online and offline modes.
- Fixed an error that occurred when a user disconnected the Veronte while a download was in progress.
- The naming format for logs has been modified to include the log type, Autopilot S/N, and a full timestamp for easier identification.