



Manual DynaPortable

Model : HF+s PO

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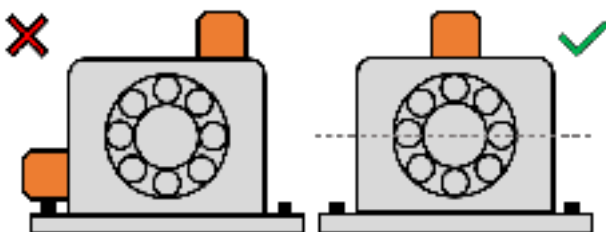


Quick Mounting Guide

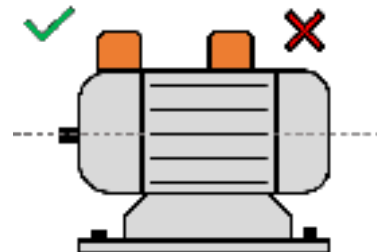
- Define the critical points of the machines to be monitored for the HF+s PO positioning;
- It is only necessary to position one HF+s PO per monitoring point, because the devices are triaxial;
- Avoid positioning in areas of the housings that present any stiffness loss. Example: cooling fins, covers, and protections. Try to position in rigid parts of the machine, preferably near the bearings;
- Align one of the axes of the HF+s PO with the actual axis of the machine. These axes are shown in the schematic above and on the body of the devices.



Figure: Axis orientation - HF+s PO.



It is recommended, as much as possible, to position the HF+s PO centrally in the component.



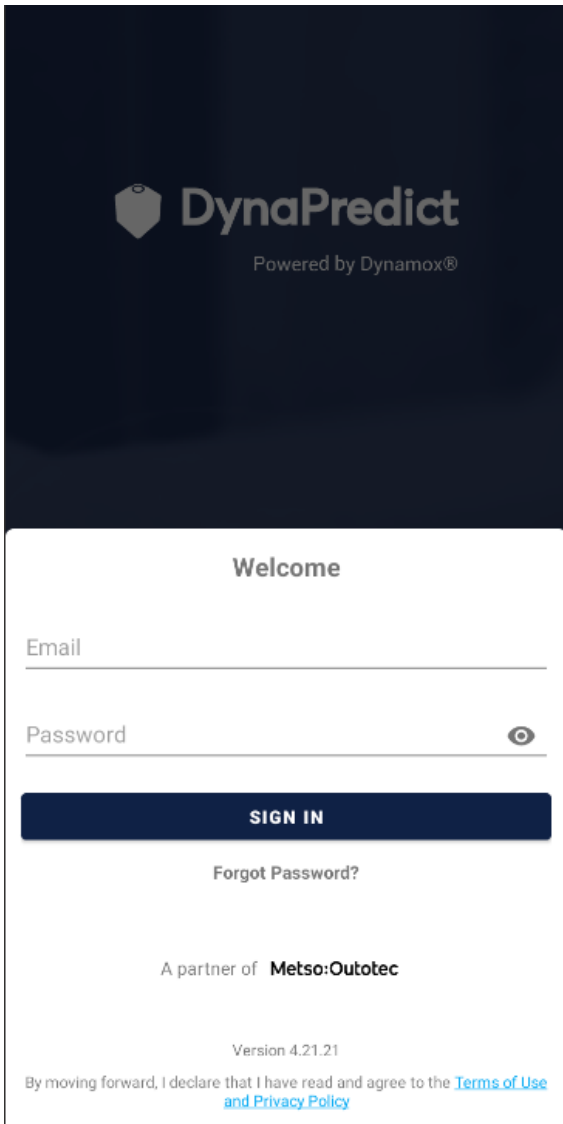
Positioning on cooling fins and covers is not recommended.

Note: For motors, the recommendation is to position a sensor on the coupled side and another one on the opposite side for complete monitoring.

1. Accessing the system

1.1) Install the application

To configure and use the Dynamox sensors, it is necessary to download the "DynaPredict" application. The app is available on Android devices (running Android 5.0 or higher) and iOS devices (running 11 or higher), and it is compatible with smartphones and tablets.



The screenshot shows the DynaPredict login interface. At the top, there is a dark blue header with the DynaPredict logo and the text "Powered by Dynamox®". Below this is a white login form with the heading "Welcome". The form contains two input fields: "Email" and "Password" (with a toggle for visibility). A dark blue "SIGN IN" button is positioned below the password field. Underneath the button is a link for "Forgot Password?". At the bottom of the form, it states "A partner of Metso:Outotec" and "Version 4.21.21". A final line of text reads "By moving forward, I declare that I have read and agree to the [Terms of Use and Privacy Policy](#)".

To perform the installation, simply search "Dynampredict" in your device's app store (Google Play Store/App Store) and complete the download.

It is also possible to download the Android version from a computer by accessing the Google Play Store.

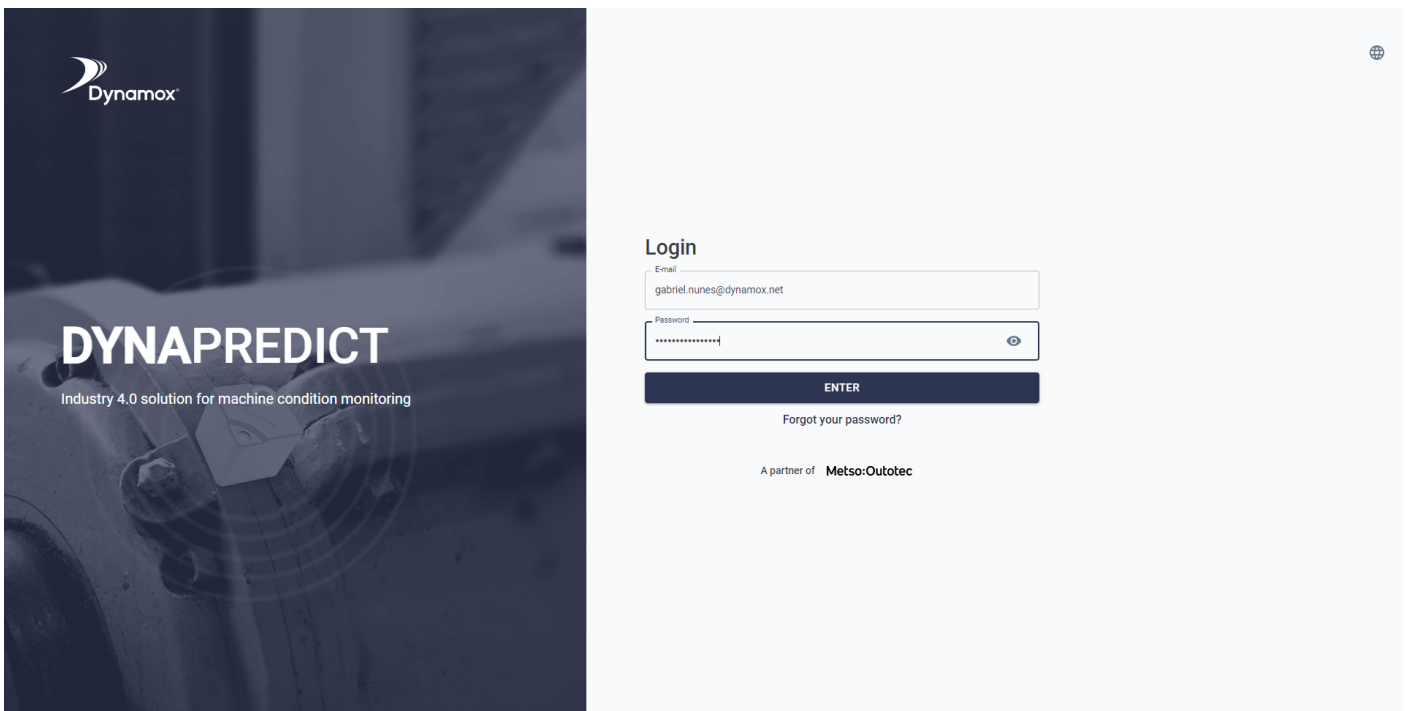
Note: You must be logged into your Google account, and it must be the same account registered in the Play Store on your Android device.

To access the Dynamox Application or Web Platform, you must have access credentials. If you have already purchased our products and do not have credentials, please contact us via e-mail (support@dynamox.net) or by phone (+55 48 3024-5858) and we will provide you with access information.

1.2) Accessing the Web Platform

To create the hierarchical structure that determines in which machines the DynaPortable (Dynamox's portable sensor) will be used, as well as to access the entire history of vibration measurements collected by the DynaLogger, users have a complete Web Platform available.

Just access the link <https://dyp.dynamox.solutions> and log into the system with your access credentials, the same ones used to access the application.



2) Creating and structuring the asset tree

Before taking your portable sensor into the field, it is recommended to ensure that the asset tree (hierarchical structure) is properly set up, with the monitoring points already standardized, waiting for the sensor that will be used for collection.

The Asset Tree is a tree-like visualization, with all the assets in which the system developed by Dynamox will be deployed. This functionality allows an overview of the organizational structure, facilitating the analysis and management of assets, by hierarchizing the company's units, areas, and machines.

Through the asset tree management, it is possible to create subareas to reflect the company's structure. To edit the tree, the user (with administrator permissions) should access the "MANAGE" option in the upper right corner.

The gear symbol "⚙️", which will appear next to the name of each level, will allow editing or deleting levels. To add sublevels, the user must click on the "➕" icon, next to the desired entity.

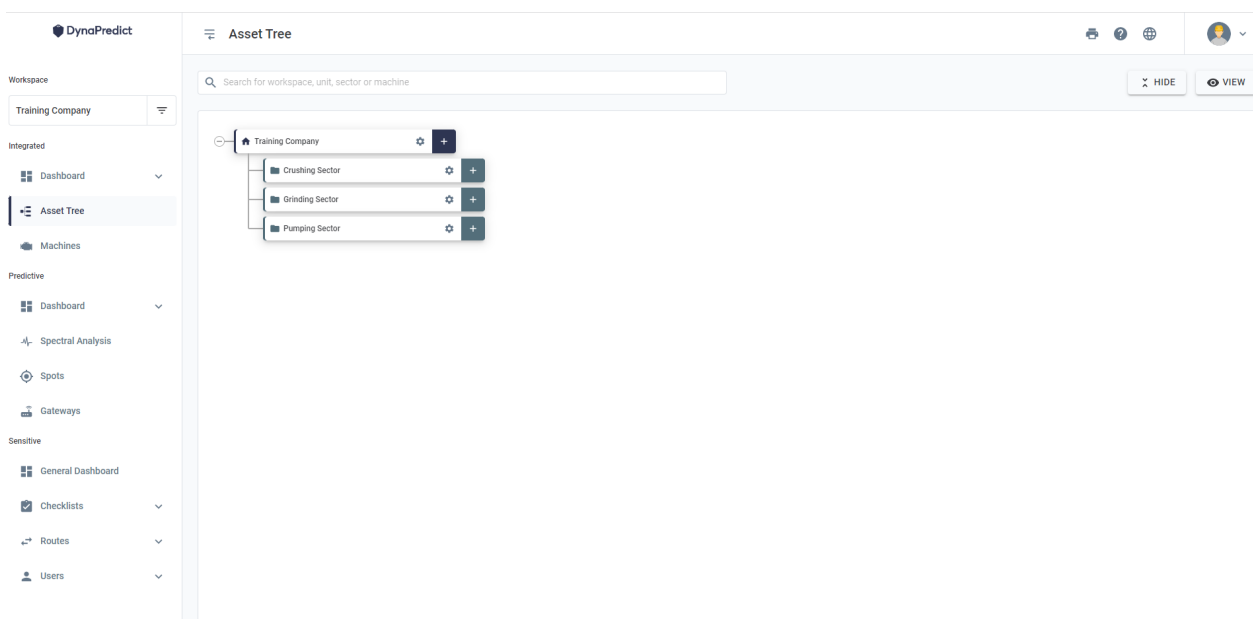


Image: Folder management in the asset tree.

By selecting the "+" icon on a desktop, a work subarea " " or a Machine " " can be created.

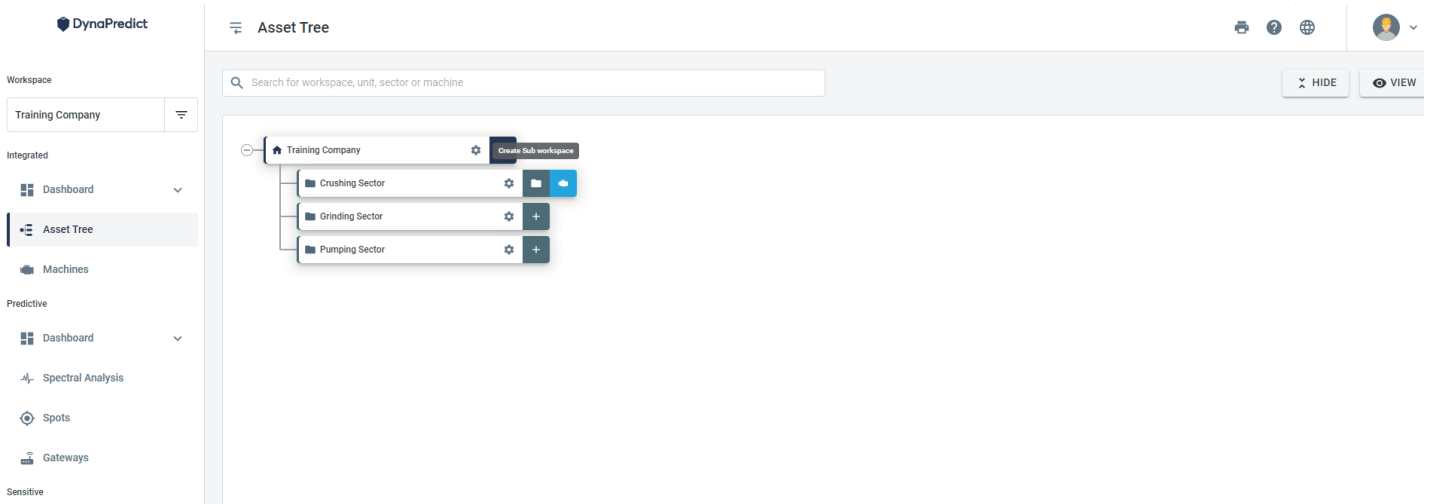


Image: Folder management in the asset tree.

By selecting the option Create Subwork Area " " , a new window will open requesting information to create this subfolder. Also, in the "users" tab, it will be possible to manage the users that will have access to this subfolder. When saving, the subfolder will be created.

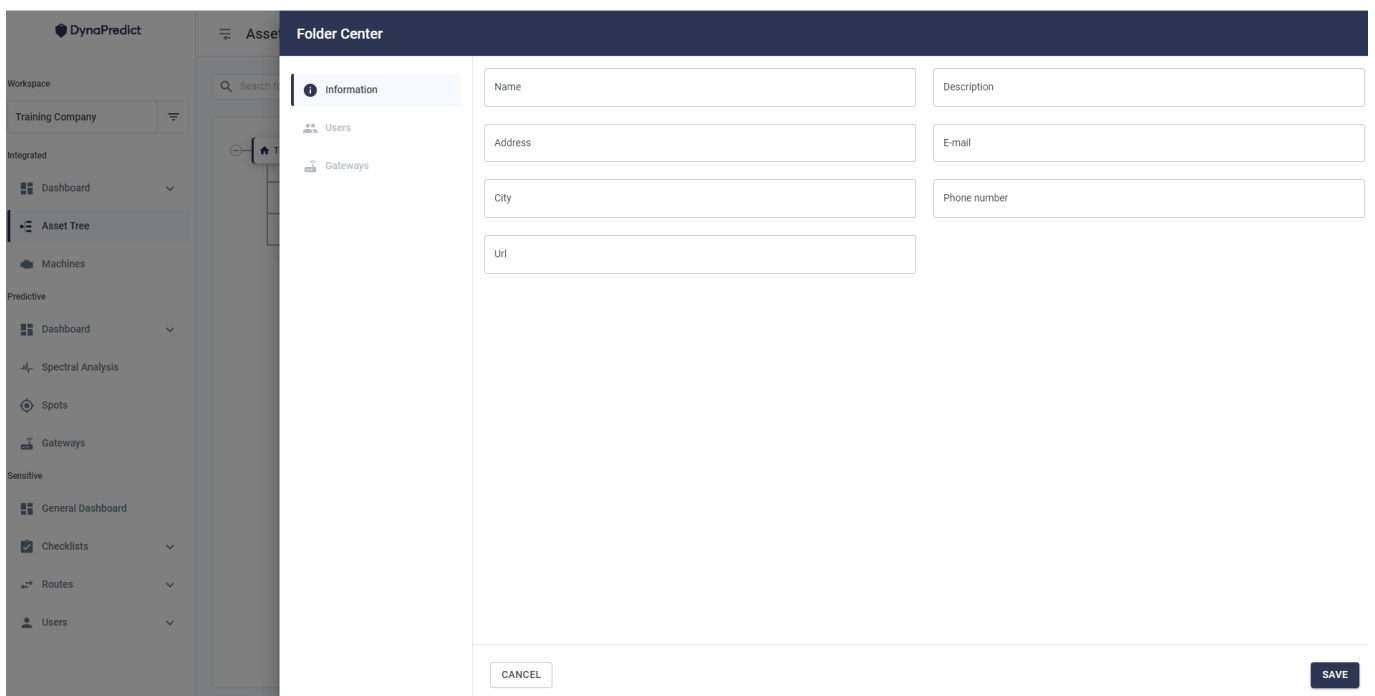

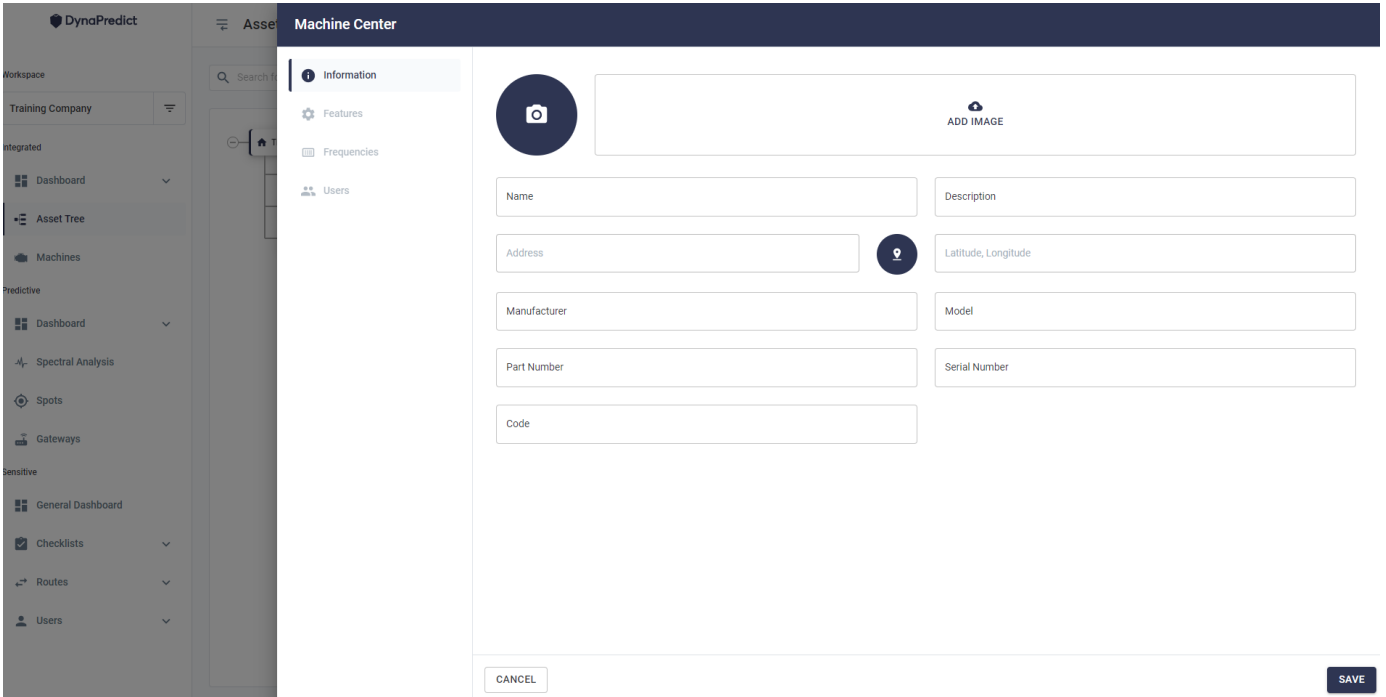


Image: Work subarea configuration.

When creating a machine, the user must select the “” option. The following information will be requested:



The screenshot shows the 'Machine Center' configuration interface. On the left is a sidebar with navigation options like 'Training Company', 'Dashboard', 'Asset Tree', 'Machines', 'Spectral Analysis', 'Spots', 'Gateways', 'General Dashboard', 'Checklists', 'Routes', and 'Users'. The main area is titled 'Machine Center' and contains a form with the following fields:

- Information** (selected tab)
- ADD IMAGE** button with a camera icon
- Name** (required field)
- Description** (optional field)
- Address** (optional field)
- Latitude, Longitude** (optional field with a location pin icon)
- Manufacturer** (optional field)
- Model** (optional field)
- Part Number** (optional field)
- Serial Number** (optional field)
- Code** (optional field)

At the bottom of the form are 'CANCEL' and 'SAVE' buttons.

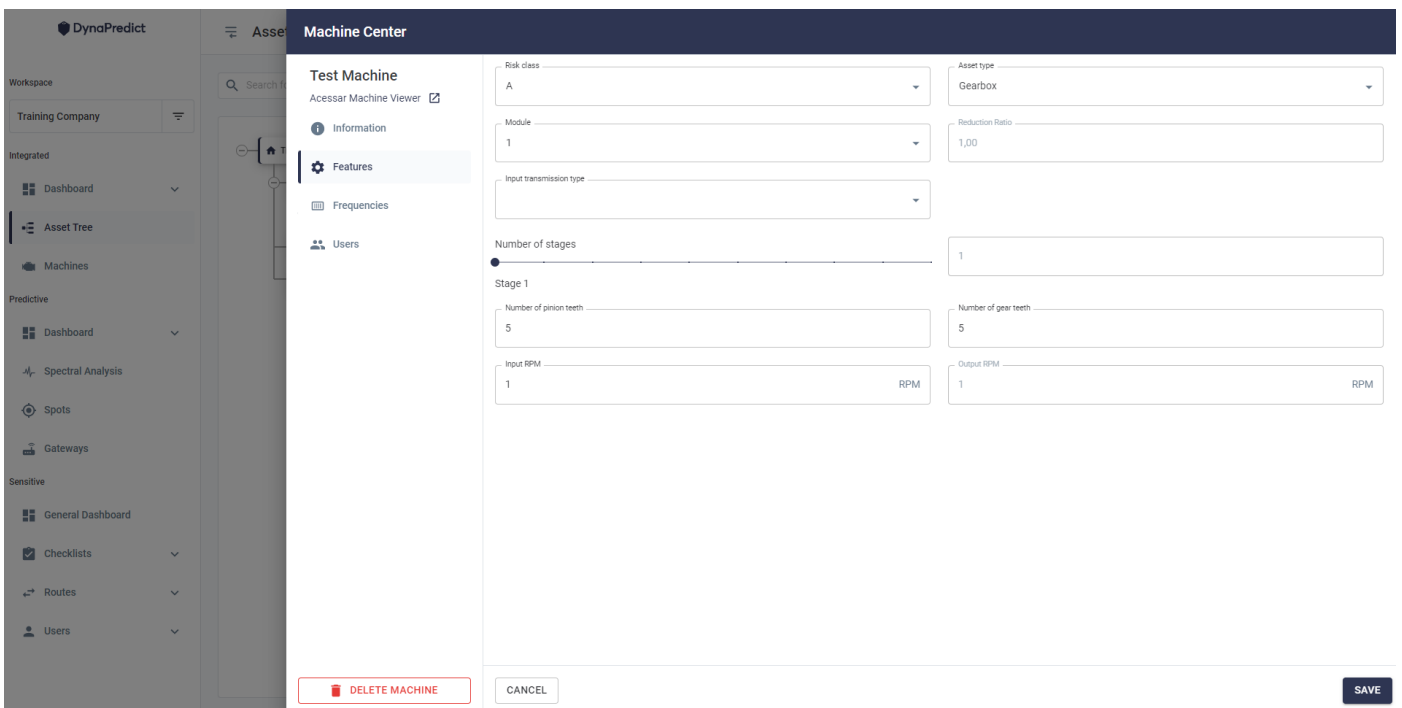
Image: New machine configuration tab.

2.1) Information

- Machine name (required): used for machine identification;
- Machine description (optional): information regarding function, position, shape, etc;
- Address (optional): location where the machine is installed. It is possible to use georeference, via Google Maps;
- Image (optional): you can register a picture of the machine;
- Other information: manufacturer, machine model, and other items can be entered optionally.

2.2) Characteristics

- Risk class (optional): criticality of the machine (Business Risk, A, B, C, D)
- Type (optional): A picklist presents options with different asset types. Depending on the machine chosen, technical data regarding the asset model in question will be requested. Below is an example of how to fill out the information of a gearbox in the dashboard:



The screenshot shows the 'Machine Center' interface in DynaPredict. The main panel is titled 'Test Machine' and includes a sub-link 'Accessar Machine Viewer'. A sidebar on the left contains navigation options: Information, Features (selected), Frequencies, and Users. The main form contains the following fields:

- Risk class:** A dropdown menu with 'A' selected.
- Asset type:** A dropdown menu with 'Gearbox' selected.
- Module:** A dropdown menu with '1' selected.
- Reduction Ratio:** A text input field containing '1,00'.
- Input transmission type:** A dropdown menu.
- Number of stages:** A slider control set to '1'.
- Stage 1:** A sub-section containing:
 - Number of pinion teeth:** A text input field containing '5'.
 - Number of gear teeth:** A text input field containing '5'.
 - Input RPM:** A text input field containing '1' with 'RPM' as a unit label.
 - Output RPM:** A text input field containing '1' with 'RPM' as a unit label.

At the bottom of the form, there are three buttons: 'DELETE MACHINE' (with a trash icon), 'CANCEL', and 'SAVE'.

Image: Filling in the characteristics of the monitored machine.

2.3) Frequencies (optional)

Frequencies characteristic of the machine can be added in the "Frequencies" tab. Afterwards, the Spots created within that machine will inherit the frequencies created.

2.4) Users (optional)

It is possible to register users with machine-level subscriber permissions, so that they can receive notifications via e-mail if any configured alerts are triggered by one or more Spots.

Note: A user will not be able to access, edit or delete the machine to which he/she is subscribed unless he/she has the administrator or editor permission at a higher level than the one in the asset tree.

After filling in the requested information and selecting " ", the machine will be created.

From this machine level created, it will be possible to create other new levels through the " " icon next to the desired machine. These are: Subsets (and components), Spots and, for clients of the sensitive module, associate Checklists. associar Checklists.

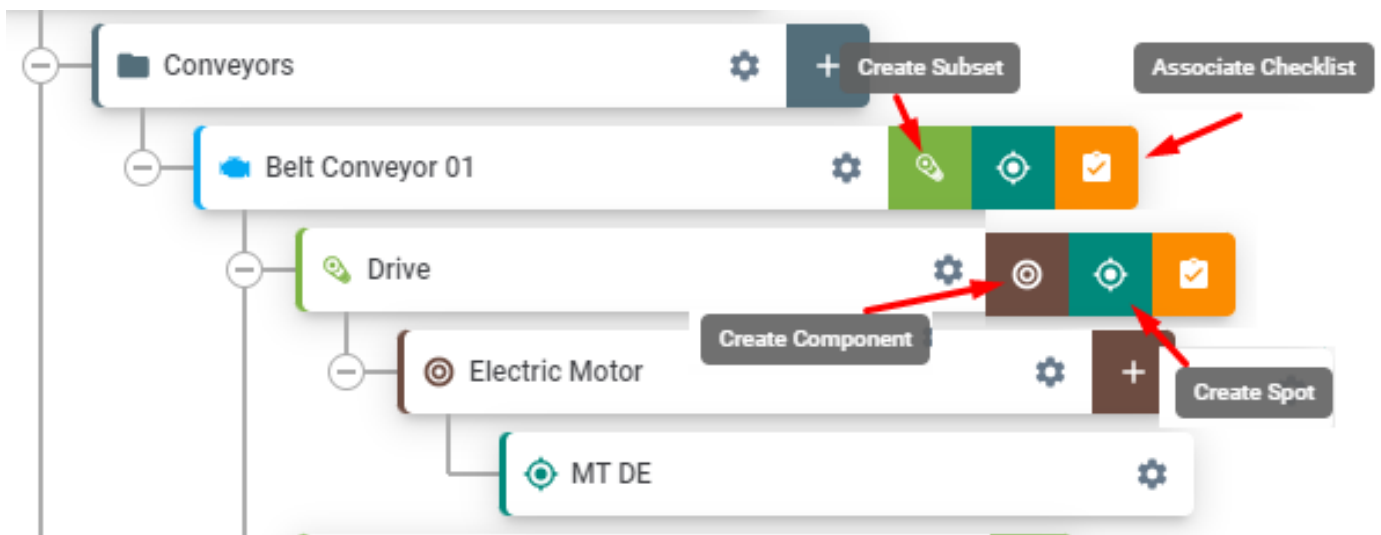




Image: Localization of the options to create subsets, components, Spots and associate checklists.

 **Subset:** indicated for large machines with several Spots. Its function is to make it possible to group Spots or checklists within sublevels of the machine, thus creating a better organization of the machine.

 **Component:** in subsets it is possible to create yet another level, that of component. These allow you, in turn, to create Spots and associate checklists separately. The creation process is similar to the procedure for creating machines/subsets.

 **Spot (monitoring points):** these are the levels where the vibration sensors are associated. Within a machine, it is possible to create as many Spots as necessary and in each one of them a history of vibration data will be generated.

 **Checklist:** exclusive for customers of the sensitive module, it allows the user to associate sensitive inspection checklist templates to the machine in question.

Note: The functions described above are only available to users with Administrator permissions.

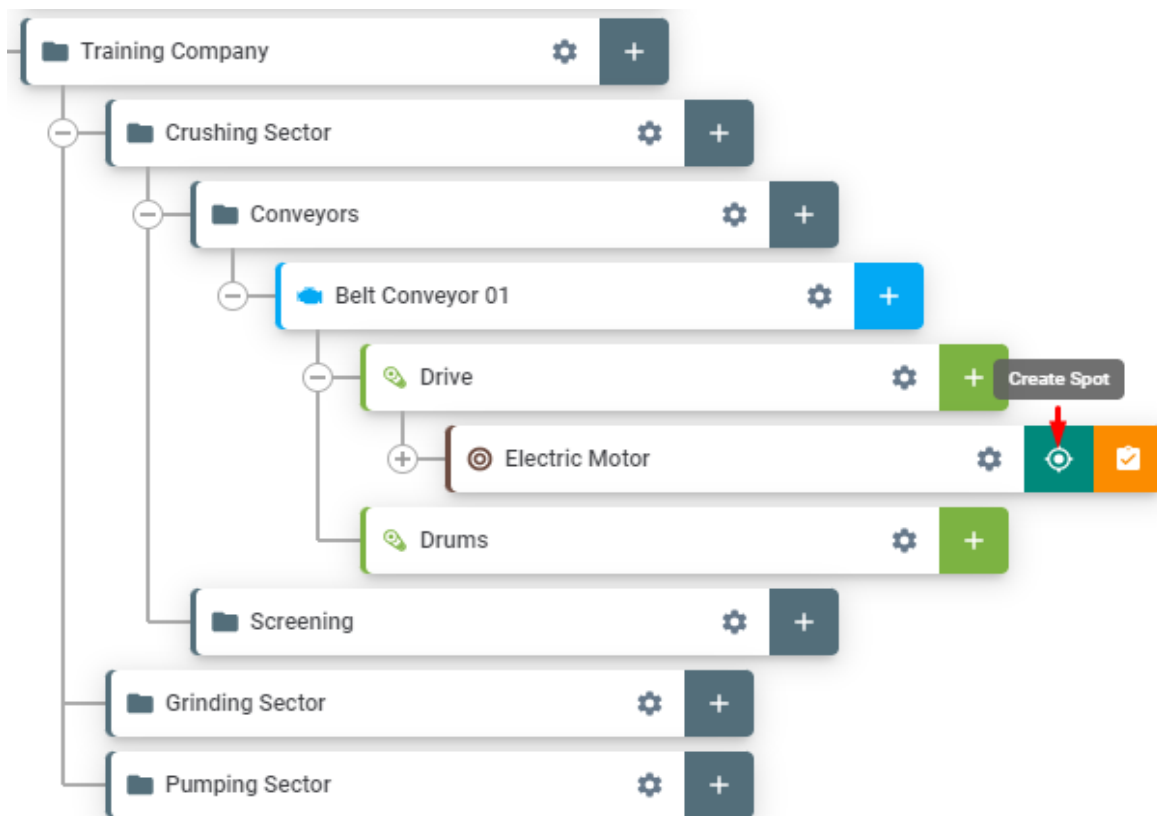
This previous organization of the asset tree facilitates the work in the field and ensures that the points are registered in the correct structure.

The structure of the asset tree should be defined by the customer and, preferably, follow the standard already used by the company in ERP software (SAP, for example).

After creating the asset tree via the Web Platform, the user should ideally also register the monitoring points (called spots) in the tree structure, before going into the field to perform data collection with DynaPortable.

Creating DynaPortable spots

A Spot (monitoring point) can be created directly within a machine, subset, or component. To start creating, simply select the "MANAGE" option in the Asset Tree, followed by the "+" button represented by the "🎯" icon, at the



desired level. Finally, the option "" must be selected to create the Spot.

Image: Spot creation.

By clicking on the "Create Spot" command, a new registration screen, with configuration steps, will appear.

First, it is necessary to add the Spot identification, that is, the name that will be given to the monitoring point. Next, it is necessary to fill out the fields:

RPM - which refers to the revolutions per minute of the rotating component closest to the installation site of the chosen sensor.

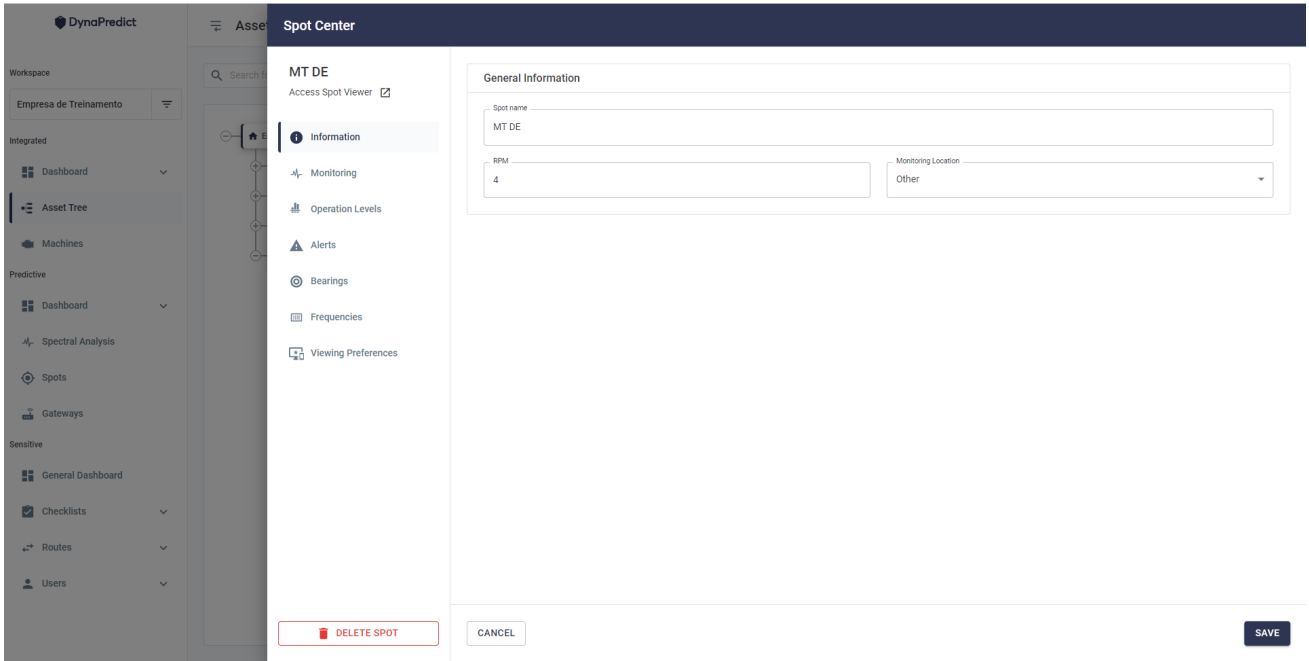


Image: Spot information tab.

Following the necessary settings:

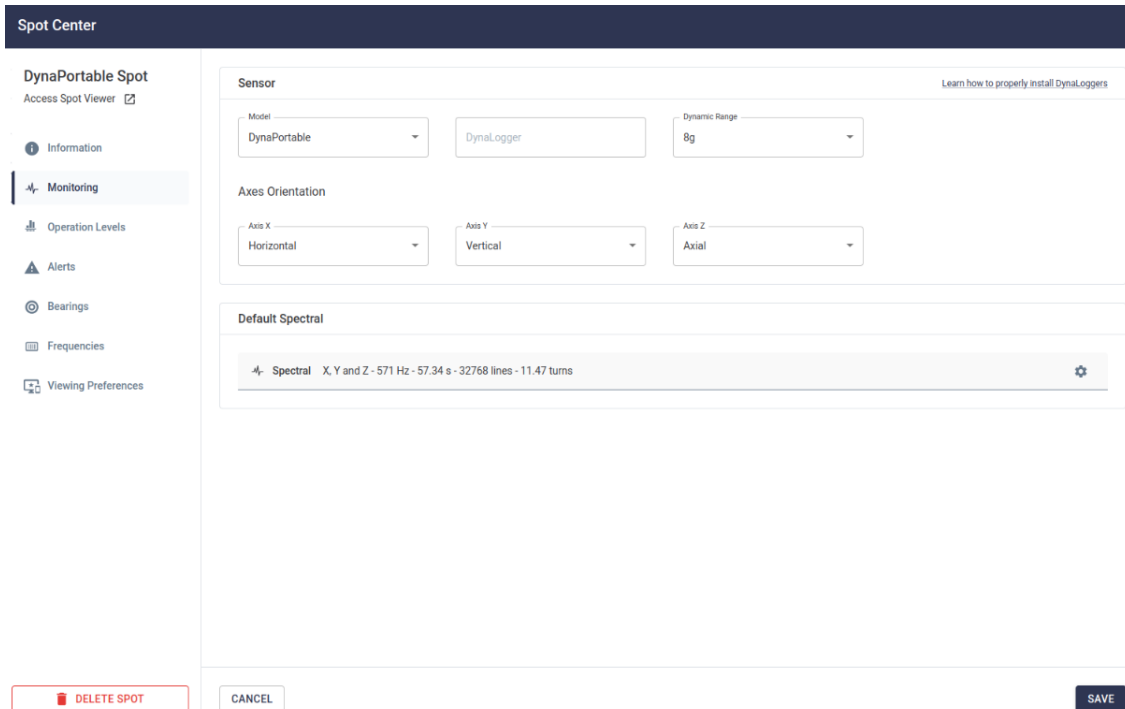


Image: Monitoring tab.

Next, we have the monitoring tab where they must be configured:

SENSOR MODEL: choose the sensor you want to register at this point, the DynaPortable.

DYNAMIC RANGE:: parameter that delimits the maximum vibration level that can be measured by the DynaLogger. The 4 options are $\pm 2g$, $\pm 4g$, $\pm 8g$ and $\pm 16g$.

This item is important for quality measurement. A poorly chosen dynamic range may result in saturation of the signal or loss of resolution and quality of the measurement. We recommend selecting the lowest value that comprises the normal vibration of the machine, and leaving a certain margin in case the values evolve. For example, the appearance of a defect in the monitored component.

AXES ORIENTATION: defines the positioning orientation of the DynaLogger that will be installed. The fixed orientation of the DynaLoggers is displayed on the body or label of the devices. Based on this orientation, the user must select the actual positioning given to the DynaLogger installed in the machine.

DEFAULT SPECTRAL: this setting is mandatory and defines the duration and maximum frequency characteristics of the standard spectrum. This default setting makes the analysis of the vibration analysts, that will later make the predictive reports, more assertive.

How do I set the default spectral?

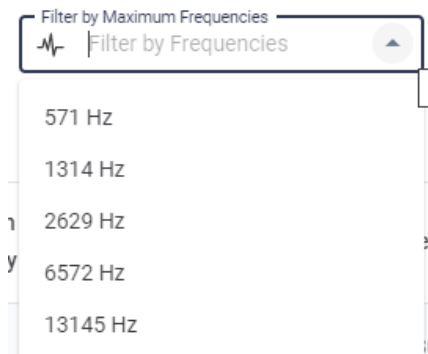
First, click on the gear to open the default spectral settings page.



In "Filter by Monitored Shafts" the shafts to be collected are filtered. The option for uniaxial or triaxial collection can be selected, as shown in the image below:



Next, you should filter by the maximum frequency of the desired collection: Remember that DynaPortable allows collections up to 13 kHz maximum frequency.



The next step is to filter by spectral lines:



Filter by Monitored Axes Filter by Maximum Frequencies Filter by Spectral Lines **ADVANCED FILTER**

Filter by Collection Durations Value Filter by Turns Value 

The collection duration field corresponds to the signal acquisition time, that is, waveform time. The available options vary according to the maximum frequency selected. Therefore, pay attention to the trade-off between maximum frequency and desired duration.

The number of revolutions and the number of lines will change according to the choices in the above fields and the rpm determined at the point. Below, there is an example for the case RPM = 1800.

Configure Default Spectral

Filter by Monitored Axes Filter by Maximum Frequencies Filter by Spectral Lines **ADVANCED FILTER**

Select a spectral setting as default:

Spectral X, Y and Z - 13145 Hz - 1.25 s - 16384 lines - 0.08 turns

	Axes	Maximum Frequency	Collection Duration	Lines	Turns	Resolution in Frequency	Resolution in Amplitude	
	X, Y and Z	13145 Hz	2.49 s	32768	0.17	0.40 Hz	0.06250 g	
	X, Y and Z	13145 Hz	1.25 s	16384	0.08	0.80 Hz	0.00024 g	
	X, Y and Z	13145 Hz	0.62 s	8192	0.04	1.60 Hz	0.00024 g	
	X, Y and Z	13145 Hz	0.31 s	4096	0.02	3.21 Hz	0.00024 g	
	X, Y and Z	13145 Hz	0.16 s	2048	0.01	6.42 Hz	0.00024 g	

SEE MORE OPTIONS

Figure: Number of revolutions and number of lines with the chosen setting of 13145 Hz and 1800 RPM.

After defining the desired settings and saving, the monitoring point will be created.

Remember that this process only creates the monitoring point (spot). To start getting vibration data from this spot, you must position the DynaPortable and associate the corresponding serial number via mobile application.

Association of DynaPortable in the APP + Data Collection

To associate a DynaPortable to the monitoring point (spot) and enable the collection of monitoring data, it is necessary to follow only 4 steps.

Registering the portable sensor

First, one should open the side menu of the APP and click on "Portable DynaLoggers" to scan and identify the available portable sensors by Bluetooth signal strength. When you select your portable sensor, this information will be stored in the user login until your session expires.

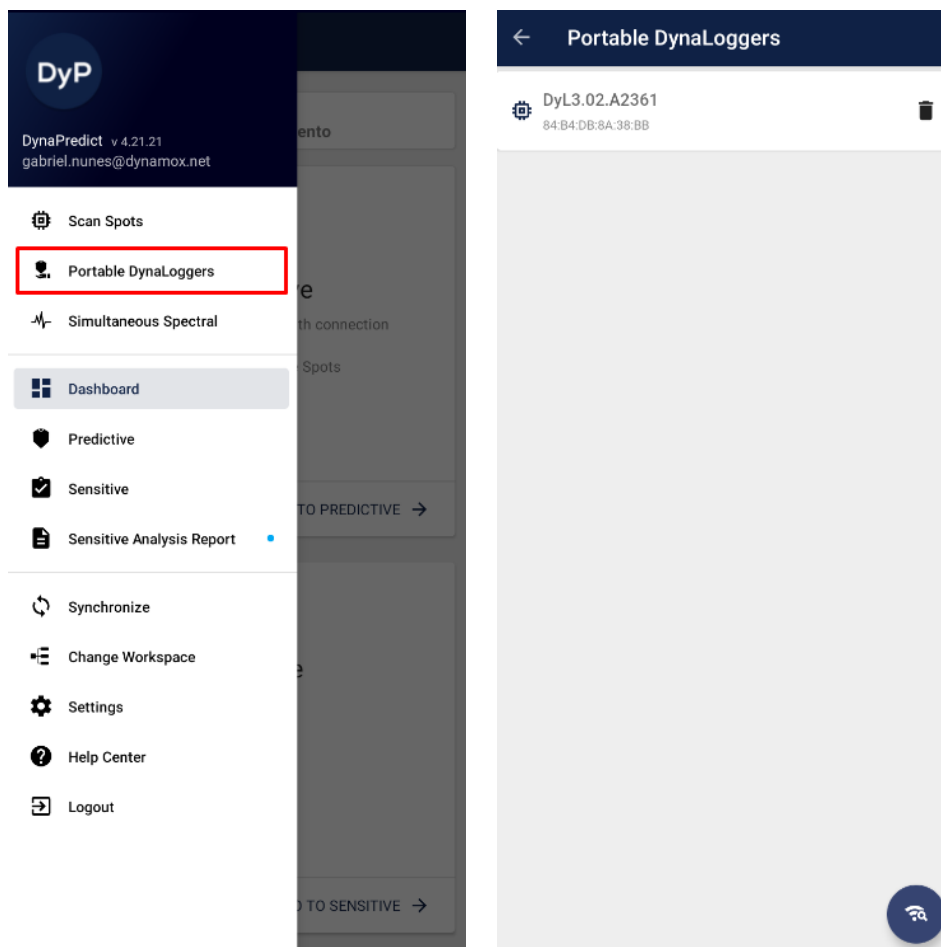


Image: step by step to find portable DynaLoggers in the APP via Bluetooth.

Choose a spot on the desired machine without an associated sensor

The second step, after selecting the portable sensor, is to access the APP side menu again, open the predictive maintenance machine list, choose a machine and then a spot without an associated sensor that will be connected to the DynaPortable. Click on the icon of the spot without an associated sensor.

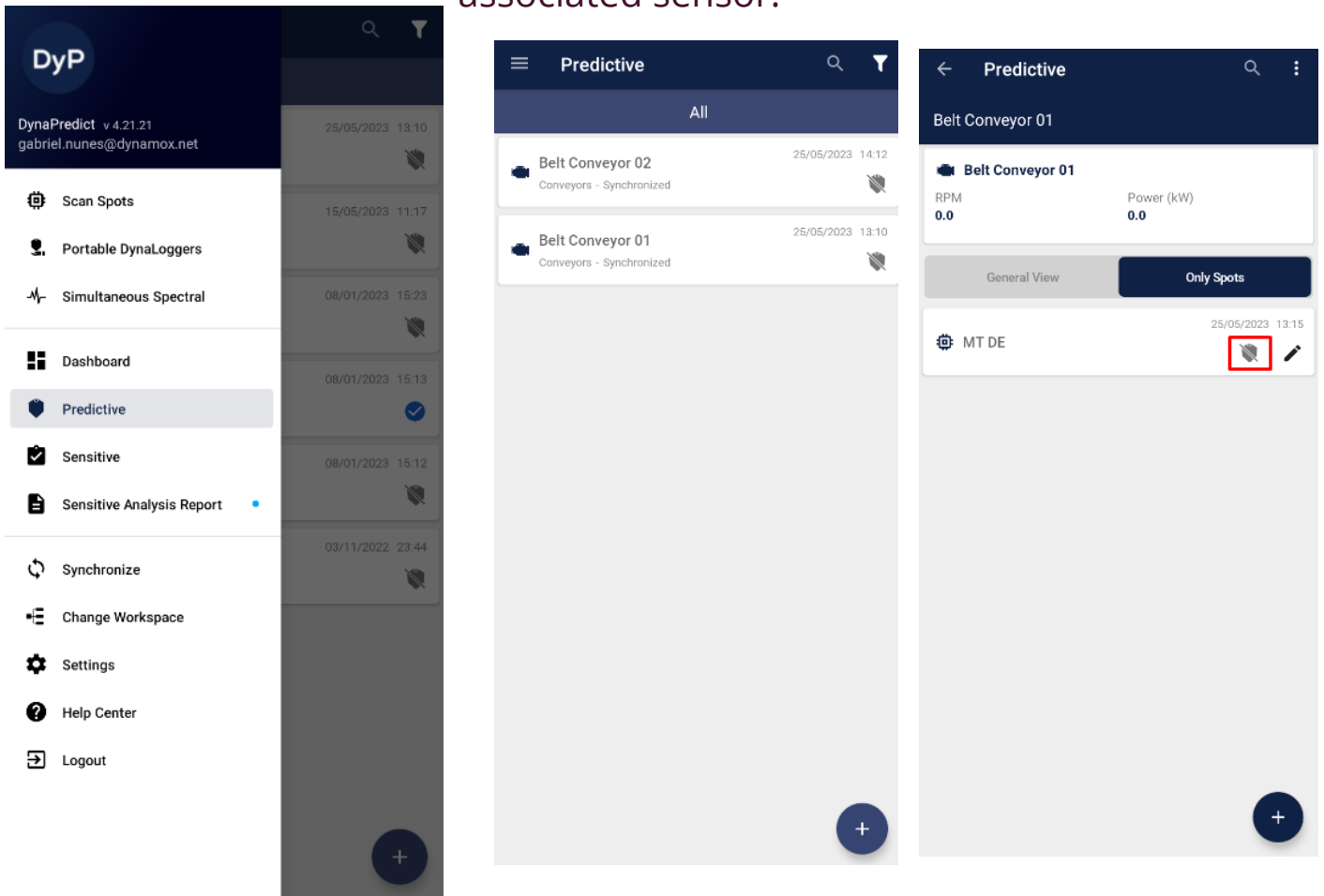
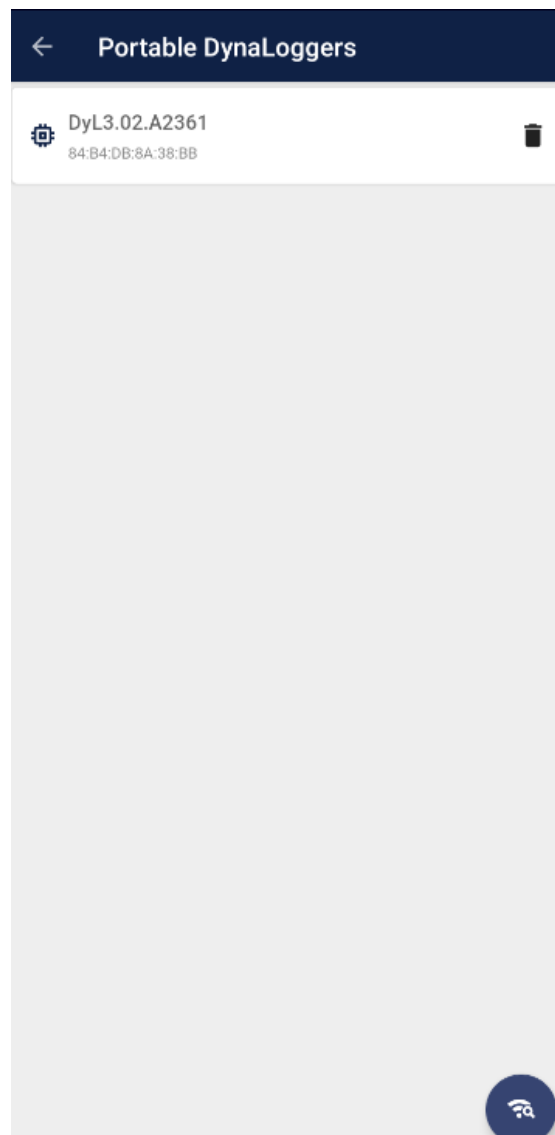
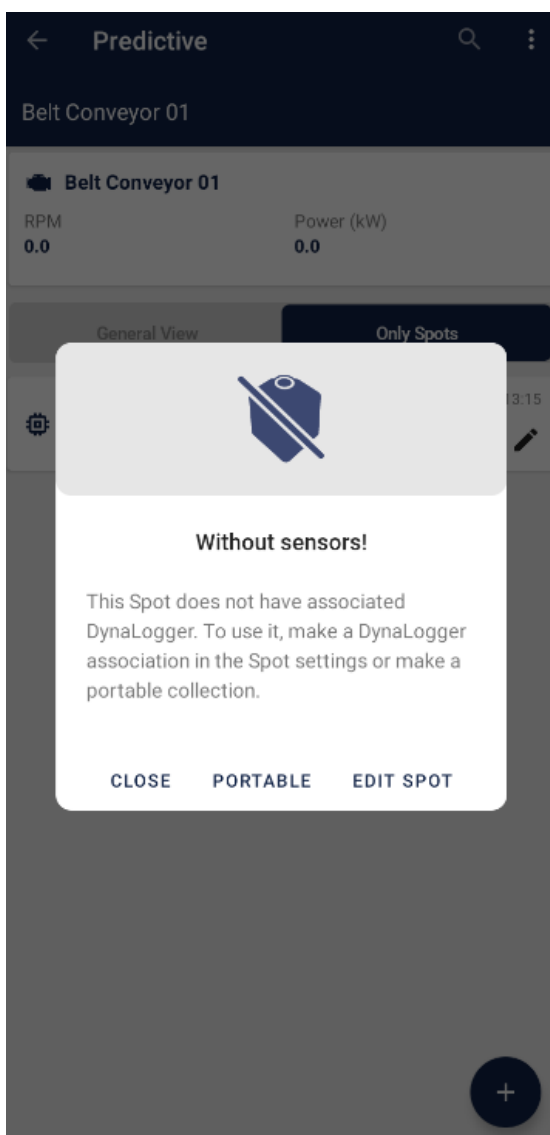


Image: step by step to find a spot machine without an associated sensor.

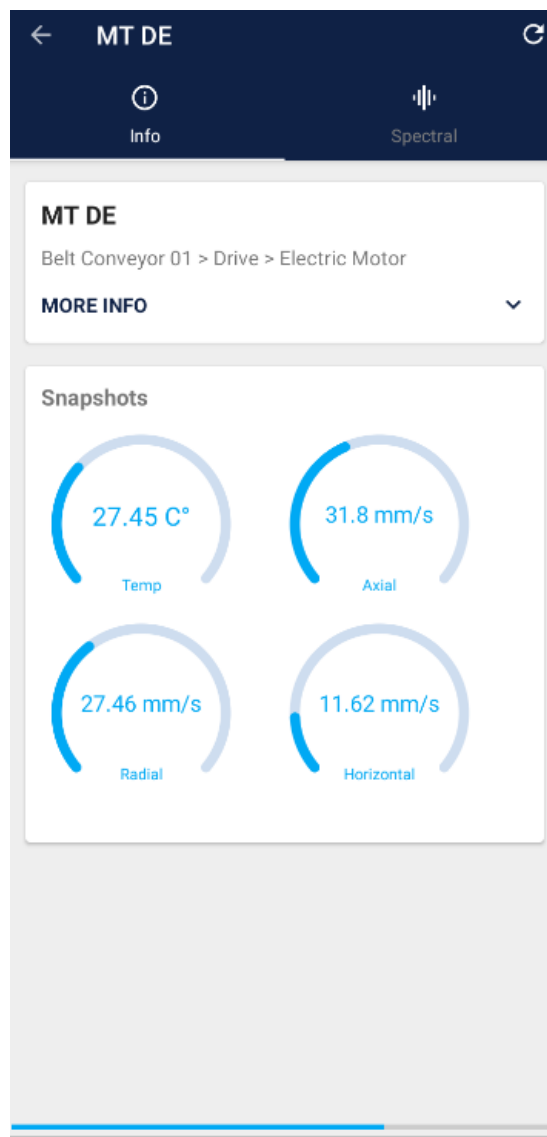
Connect the sensor to the machine in the APP

After selecting the indicated icon, a window with options will open. The "Portable" option should be selected, and access to the list of portable sensors located in the scan will be given. Choose your DynaPortable by its serial number and click on it.



Data Collection (Snapshots)

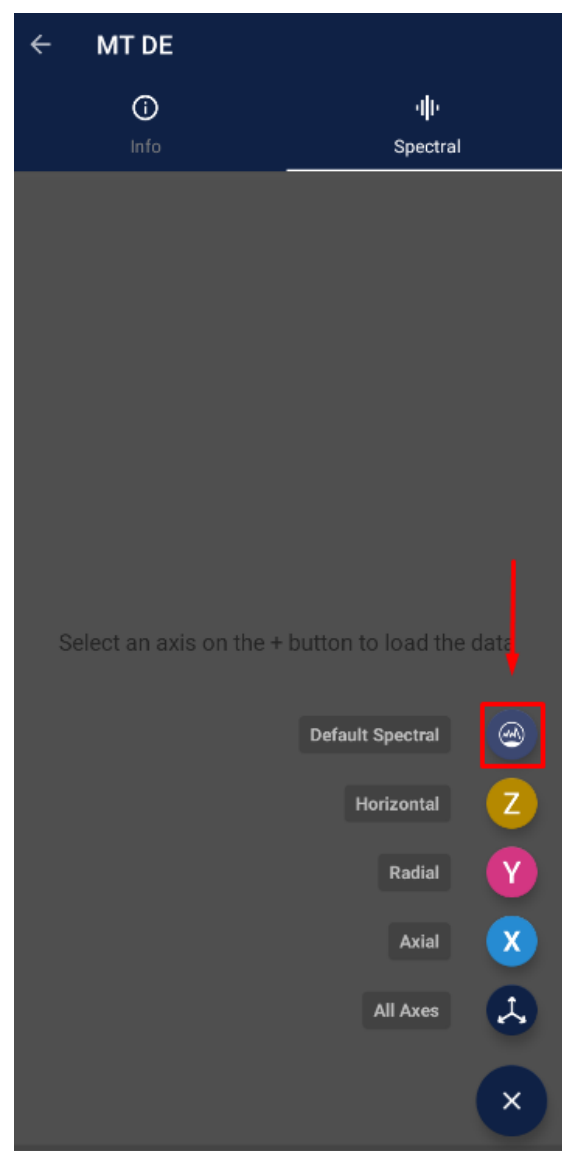
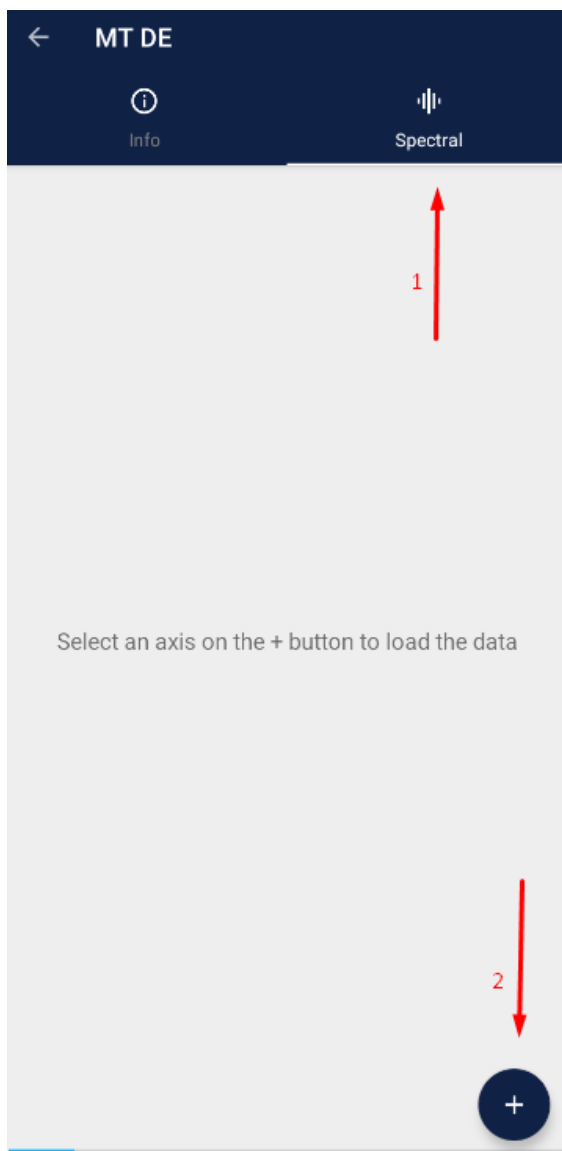
In the fourth and last step, after clicking on a portable sensor in the list, the APP will make the connection.



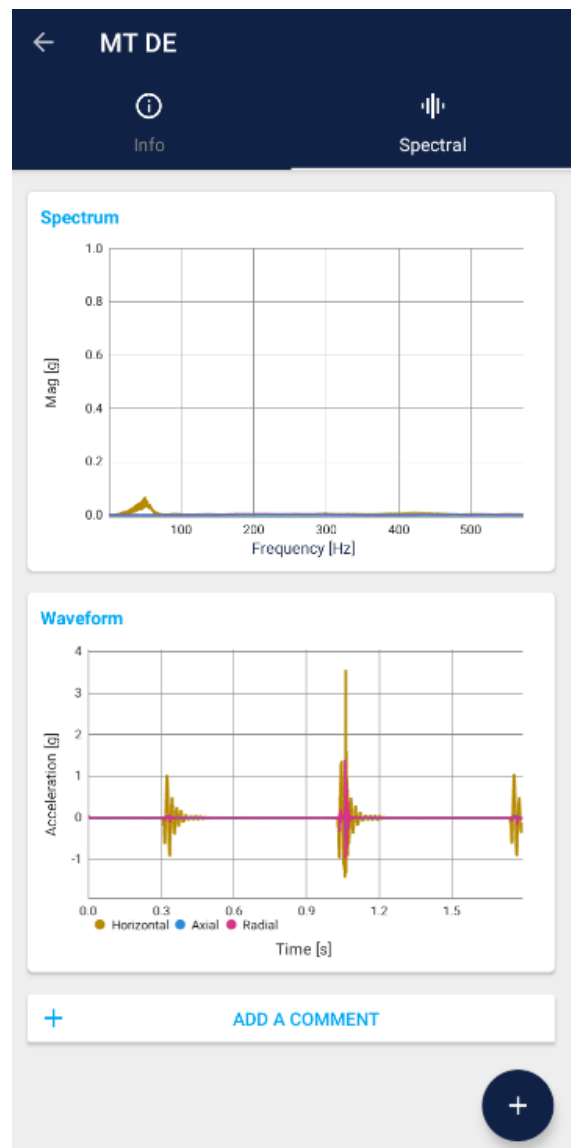
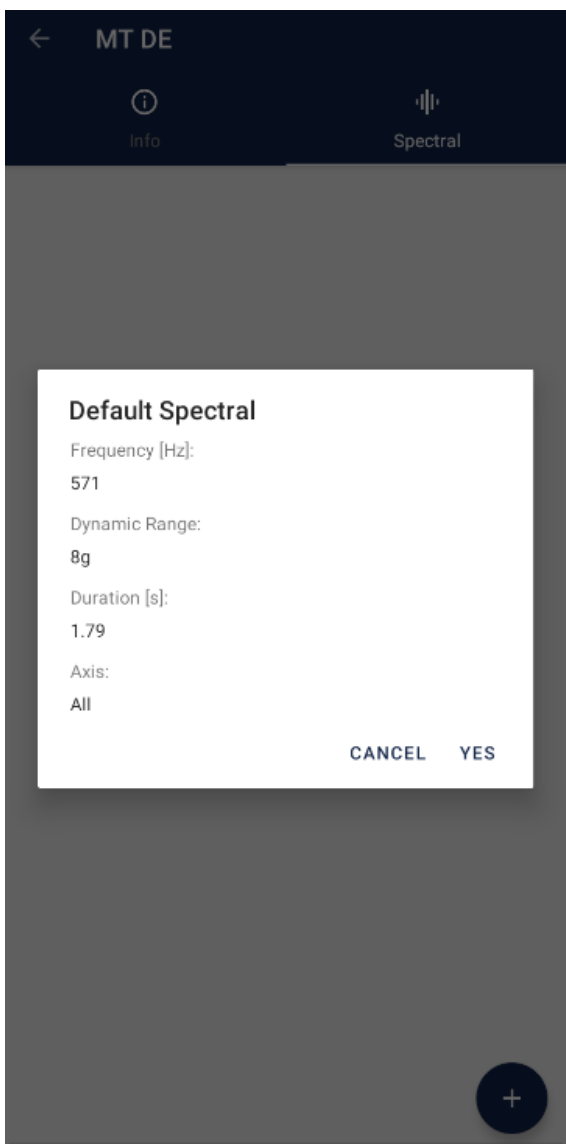
Spectral Collection

To perform a spectral collection with DynaPortable, after performing all the association steps, a few guidelines must be followed:

First, it is necessary to access the "Spectral" tab and click on the "+" icon. Next, the wanted type of spectral analysis must be determined. In this case, we will do the Default Spectral analysis, pre-determined in the Spots Creation, with values already set for maximum frequency, duration, and shafts.



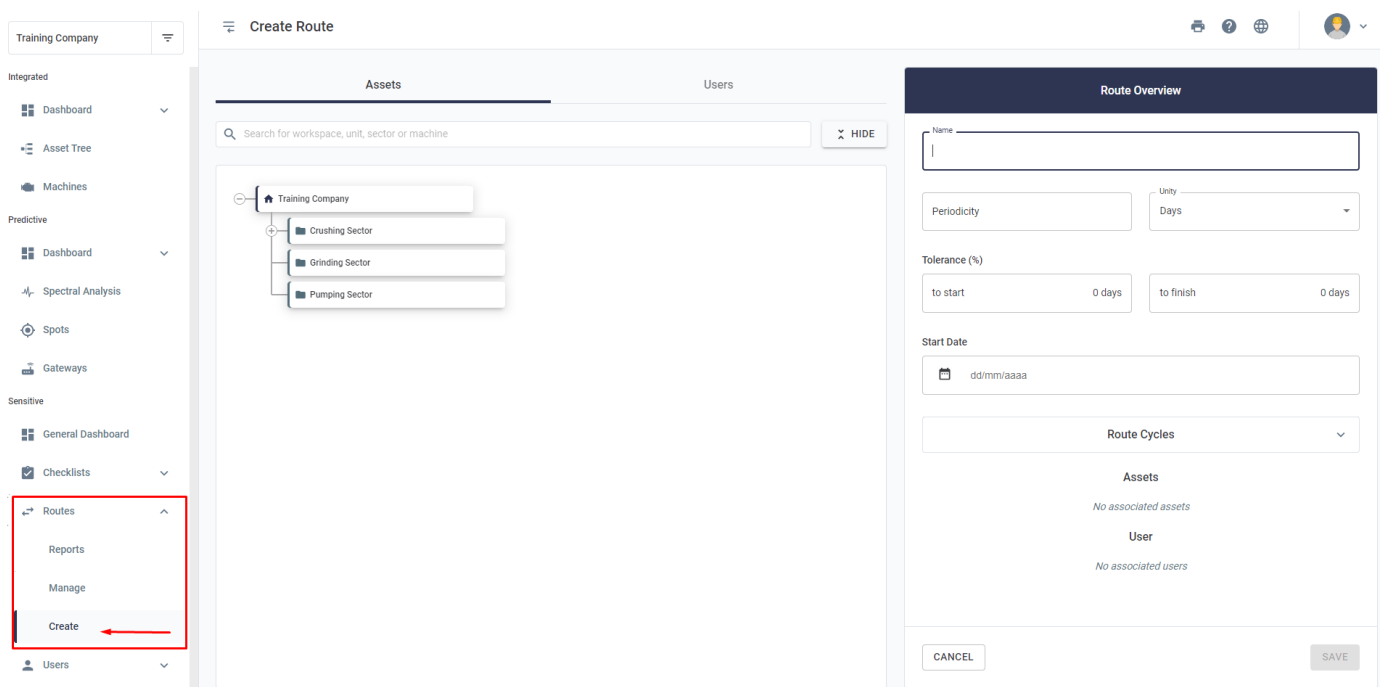
Then, you must confirm the action and wait for it to load without moving away from the sensor. After the collection, a preview of the graphs created will be displayed. To check all the data in the Web Platform, the synchronization must be performed.



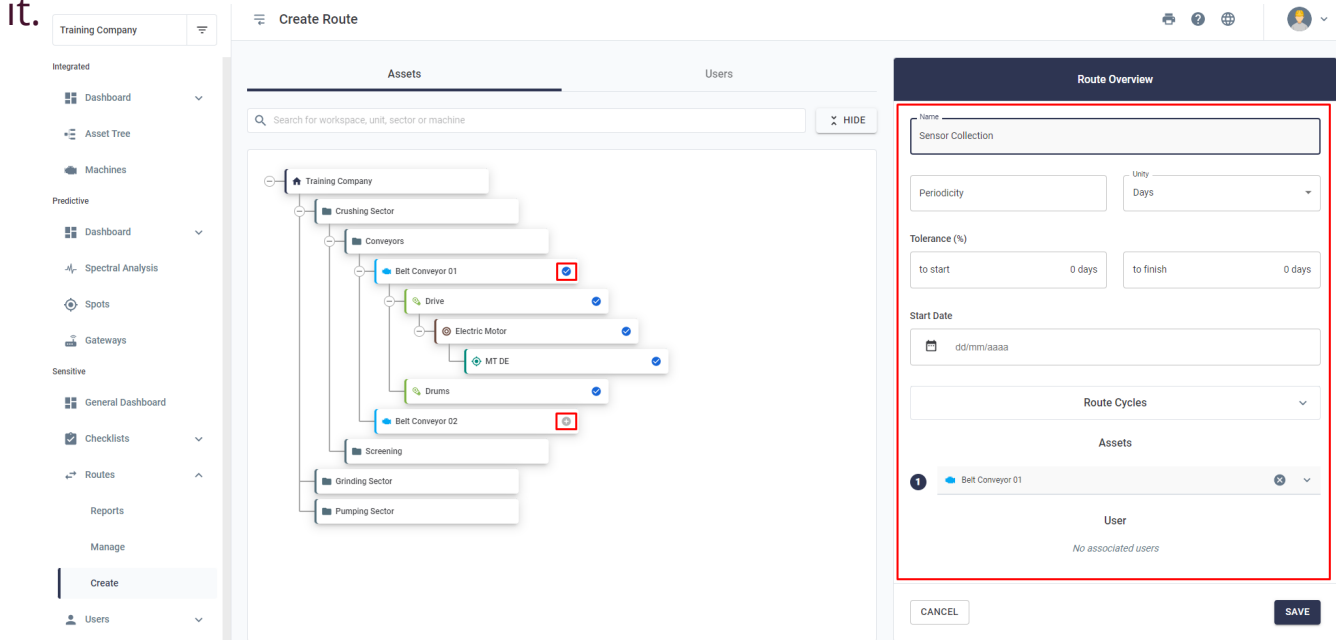
DynaSens Association + Collection

Route Creation

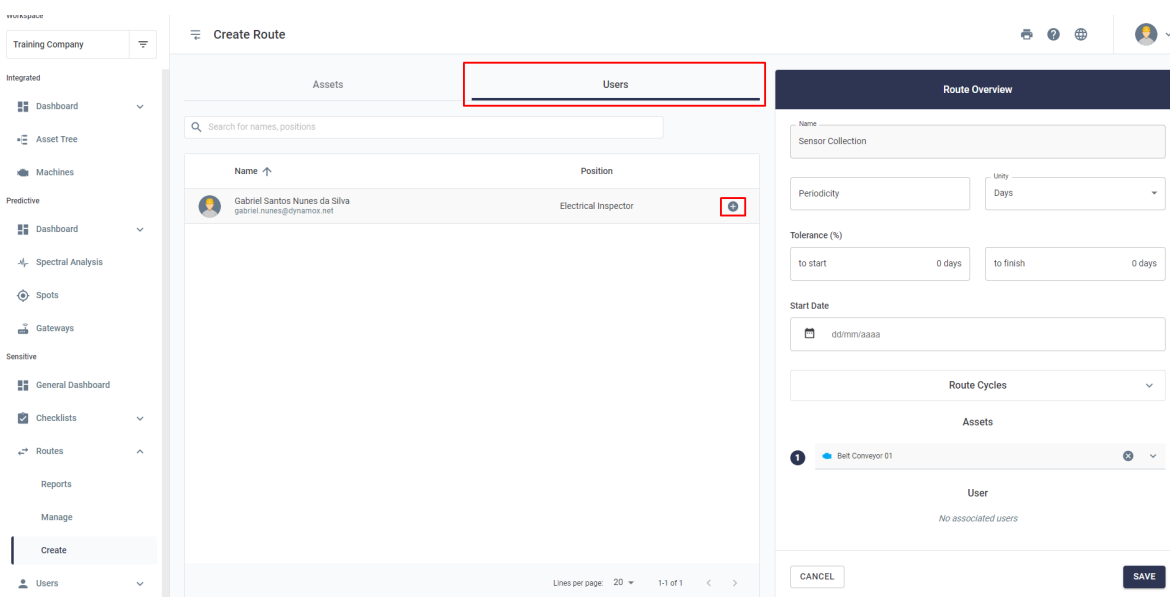
With the asset tree already created, it is also possible to create the routes that will be taken to collect data with the DynaPortable. This way, the route is structured and the machines to be inspected are identified, which organizes the routine of this work. These routes are also created in the Web Platform, in the DynaSens part.



First, it is necessary to create the name of the route and enter its information: the periodicity in which it will be performed, as well as the tolerance and start date. In addition, the machines that are on the route and that should be monitored must be added through the "+" icon. A machine already selected for the route is shown with the icon "✓" next to it.



The last configuration needed in the Route Overview is to add the users. That is, the people who will cover the route. To be added to a route, the user **MUST** have the role, within the platform, of "Electrical Inspector", "Mechanical Inspector" or "Lubricator".



Then, you must confirm the action and wait for it to load without moving away from the sensor. After the collection, a preview of the graphs created will be displayed. To check all the data in the Web Platform, the synchronization must be performed.

Route Overview

Name
Sensor Collection

Periodicity
1

Unity
Days

Tolerance (%)
to start 50 0 days

to finish 49 0 days

Start Date
05/25/2023

Route Cycles

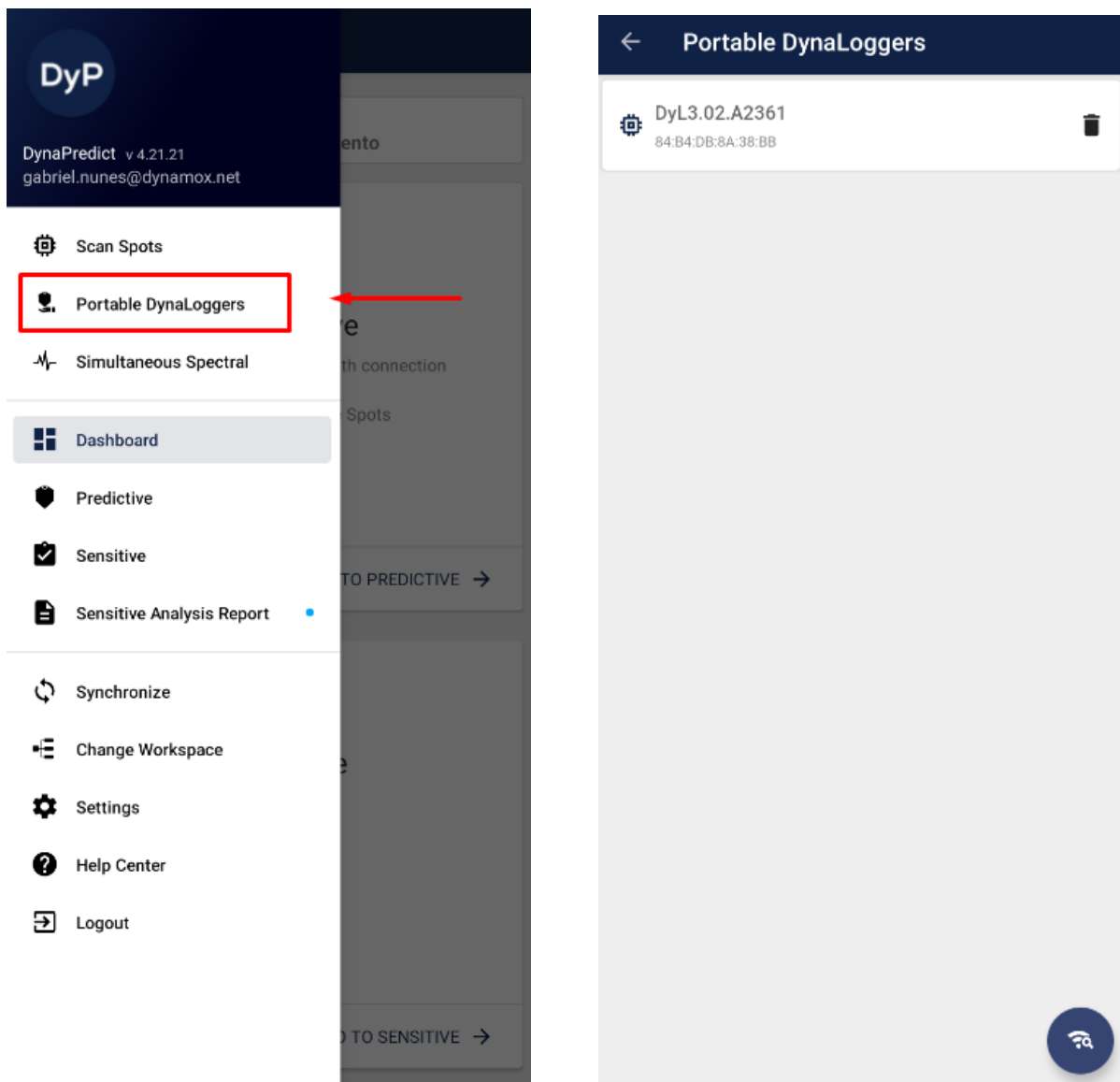
Assets
1 Belt Conveyor 01

User
Gabriel Santos Nunes da Silva - (gabriel.nunes@dynamox.net)
Electrical Inspector

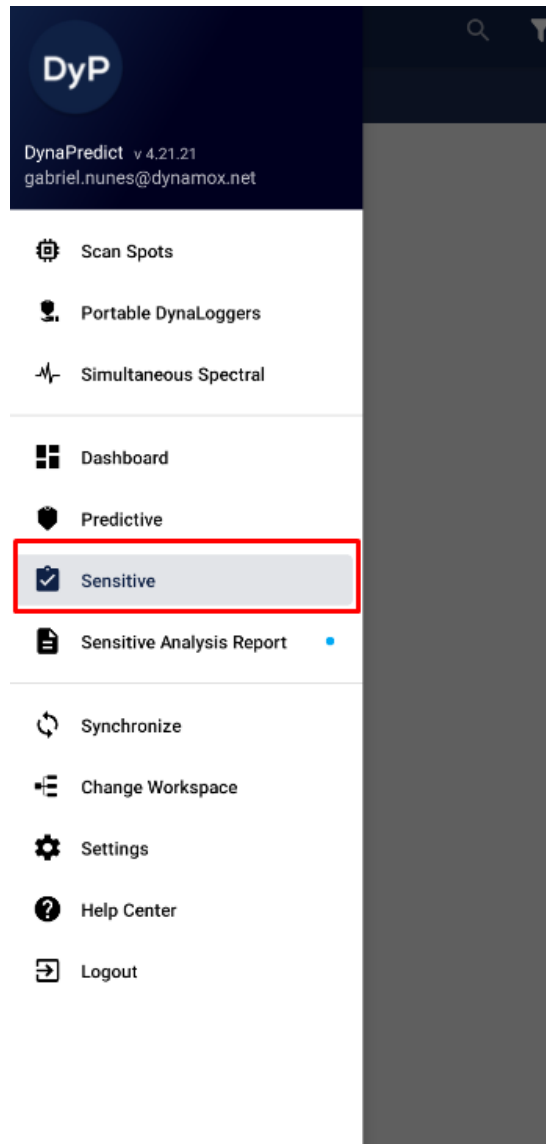
CANCEL SAVE

Association

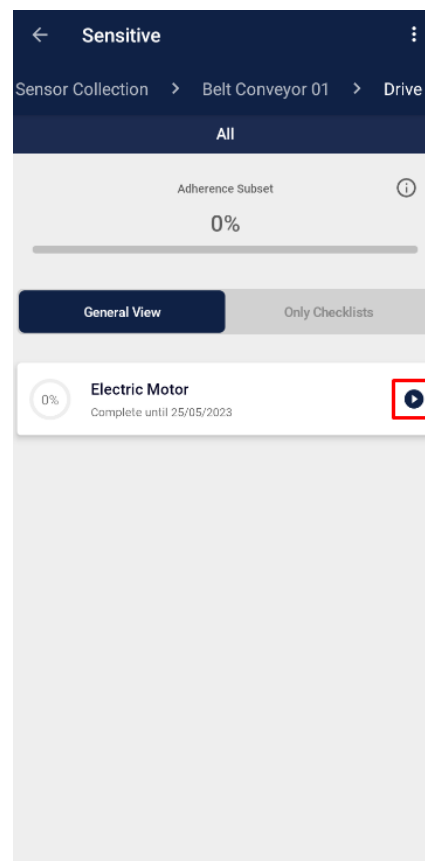
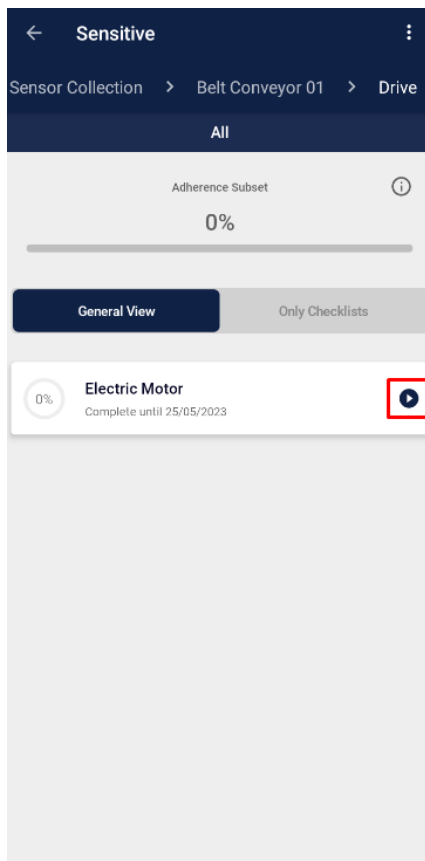
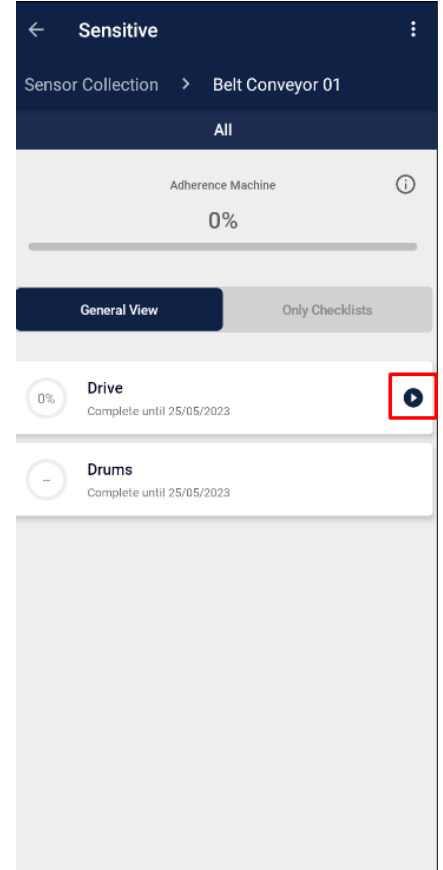
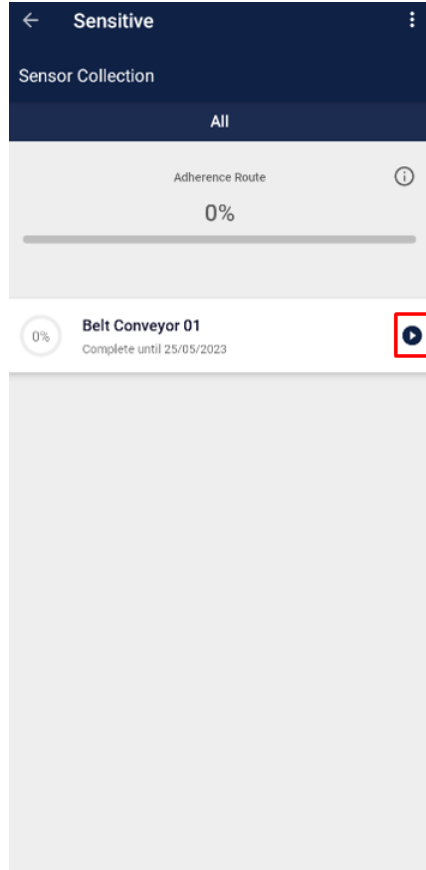
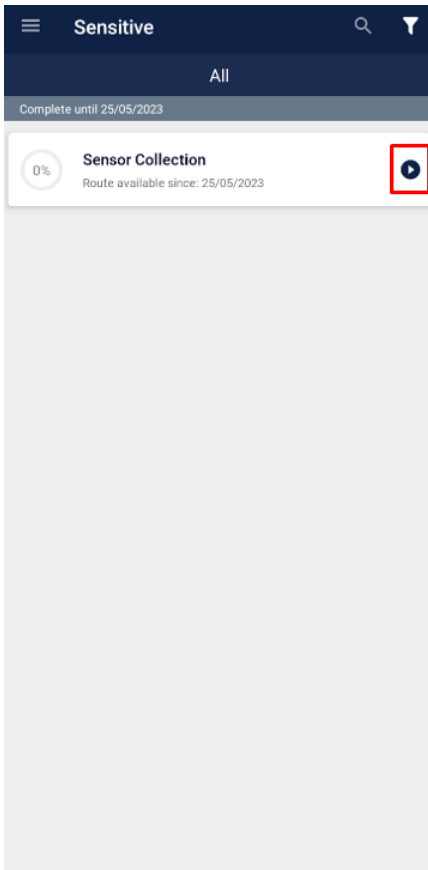
- 1) To associate the DynaPortable to the application, with the Bluetooth on, it is necessary to access the Portable DynaLoggers and, in the search section, choose the sensor that will be used by identifying its serial number:



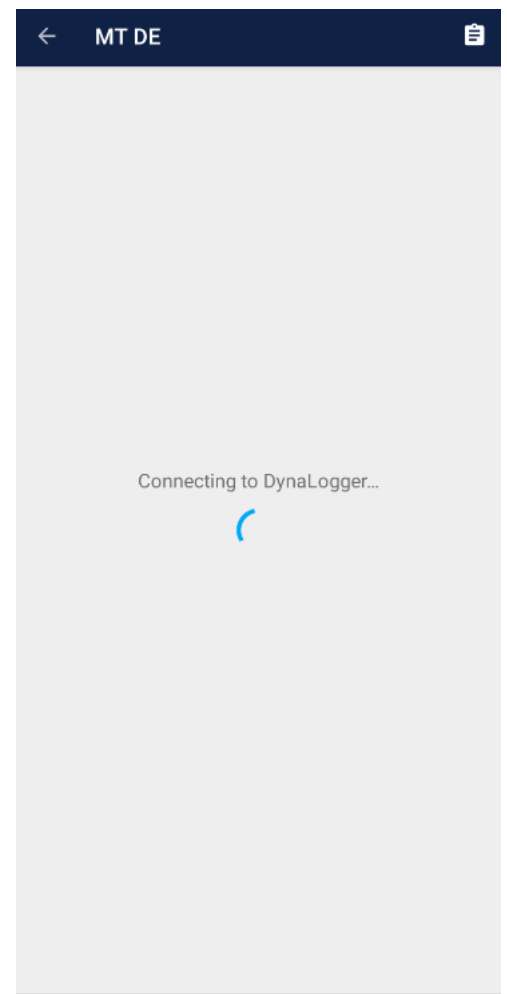
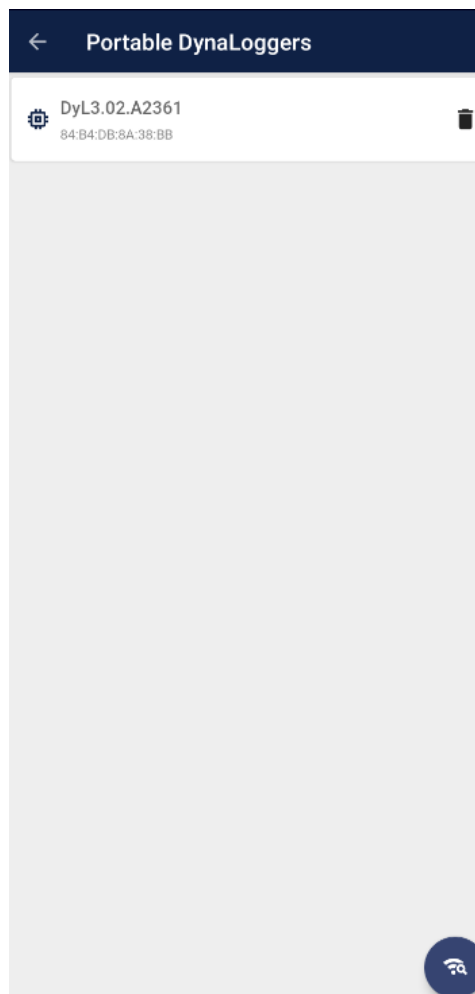
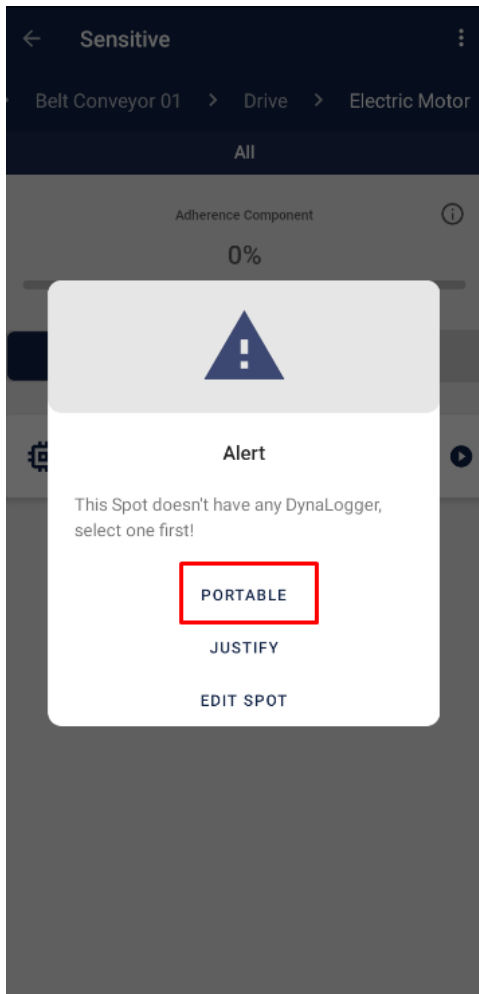
2) First, select the option "Sensitive" on the side menu of the APP.



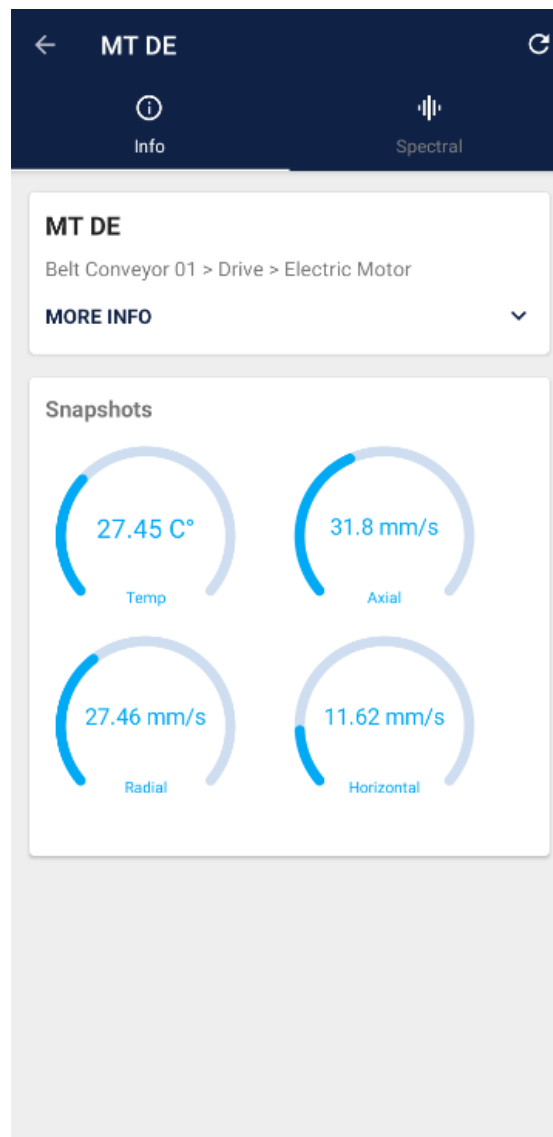
3) Then, it is necessary to identify in the APP the route that is being taken at that moment, the machine, the subset, the component, and finally the exact spot where the DynaPortable sensor will be positioned for data collection.



4) After selecting the spot, a window will open where the option "Portable" must be chosen to search for the DynaPortable sensor. Then, simply choose the device and wait for it to load.



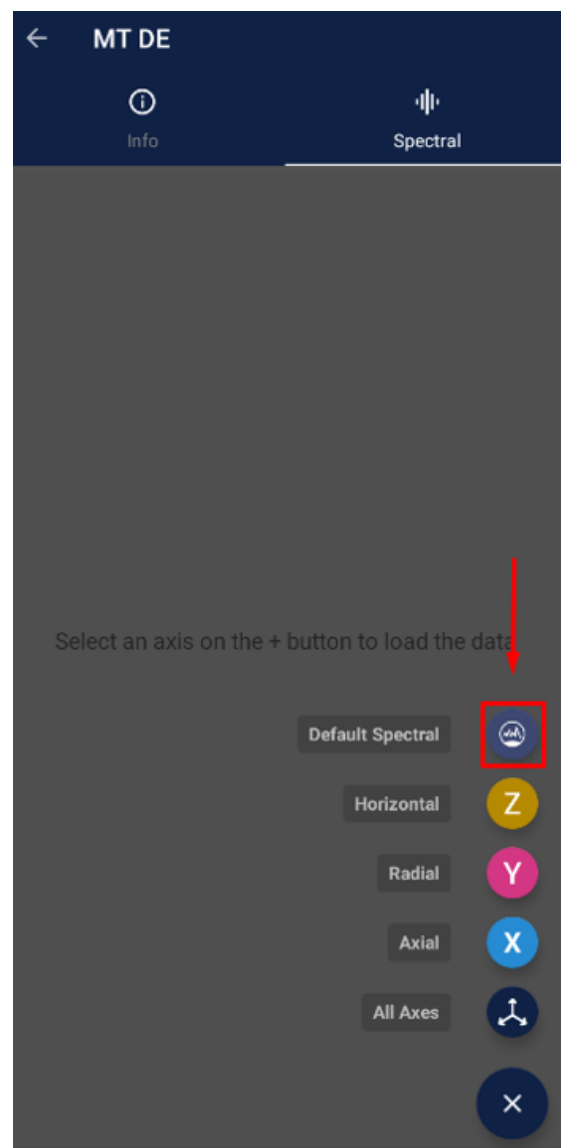
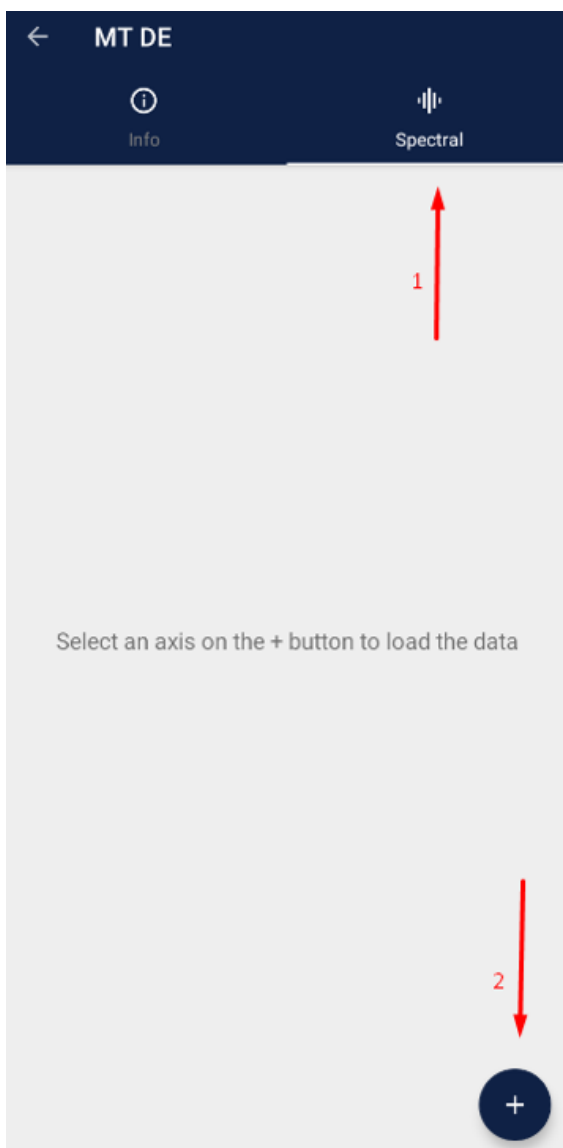
5) Finally, a screen with the Snapshots will be available, containing the data collected from the sensor at the time of collection. And to conclude this collection route, the next step is to head to Spectral.



Enroute Spectral Collection

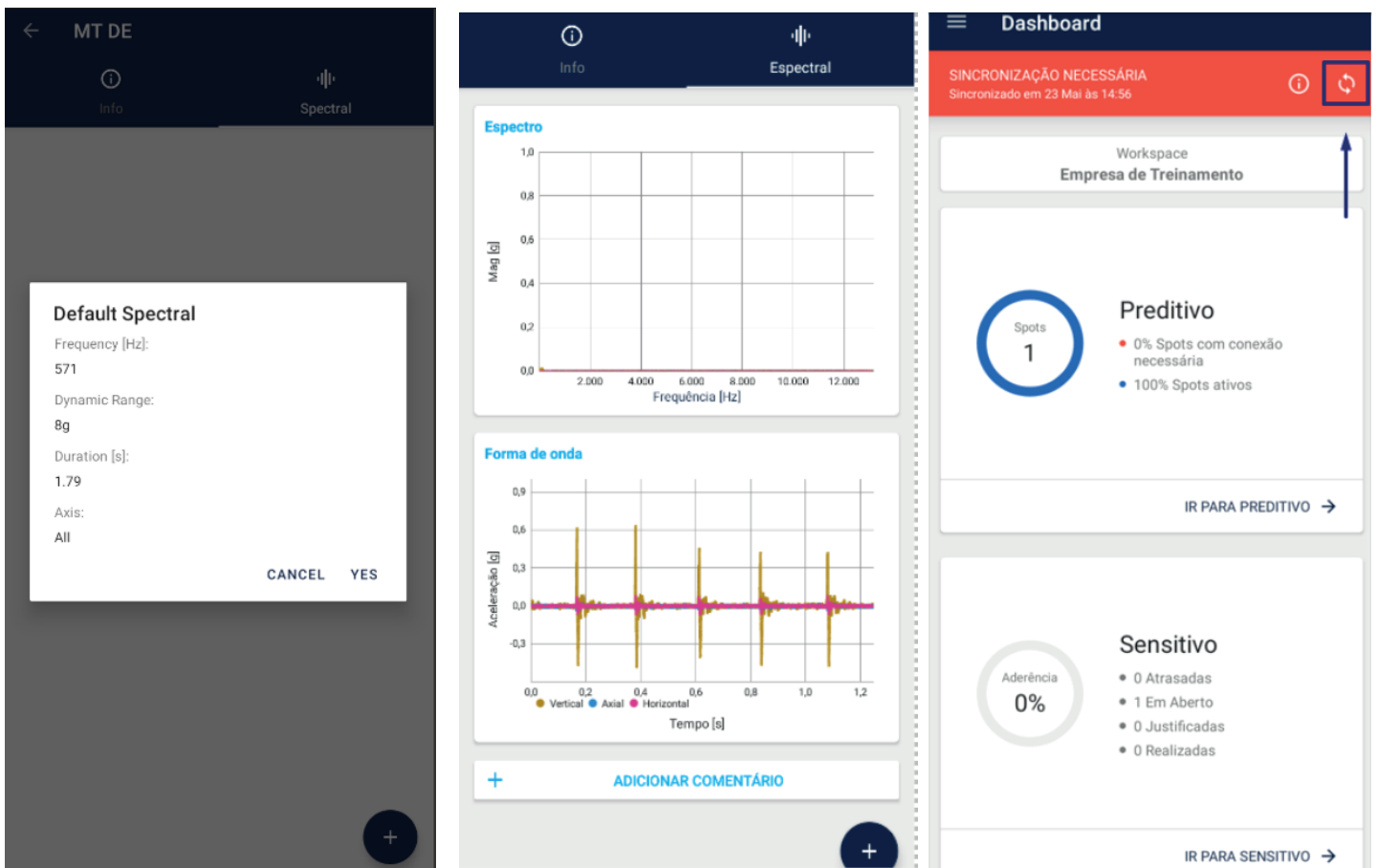
For sensor data collection enroute to be considered complete, spectral collection must also be performed. To do this, after viewing the Snapshots, switch to the Spectral tab.

Then, simply access the "+" icon and define which spectral analysis will be performed. In the case of Default Spectral, the information will be obtained with the maximum frequency, duration, and shafts values already configured in the Spots Creation step.



Then, confirm the action and wait for it to load without moving away from the sensor. After the collection, a preview of the graphs created will be displayed.

To pass all the collected data to the Web Platform and consult it, just return to the dashboard and click on 'synchronization', which is available at the top of the screen.





Dynamox

Dynamox - Exception Management

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