



DynaPredict Solution
QUICK START GUIDE

DynaLogger - Bluetooth Low Energy (BLE)

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1 Introduction

You have just purchased DynaPredict, the industry 4.0 solution for machine and equipment health monitoring.

The complete solution includes:

- **DynaLogger**, with vibration and temperature sensors and internal memory for data storage. The device is certified for zone 0 explosive atmospheres, according to INMETRO certification;
- **Application**, for data collection, action and analysis on the shop floor;
- **Web Platform**, with historic data and diagnostic tools for data analysis.

In addition, a DynaGateway could be added to the solution in order to automate data collection from the DynaLoggers and send the data directly to the Web Platform.

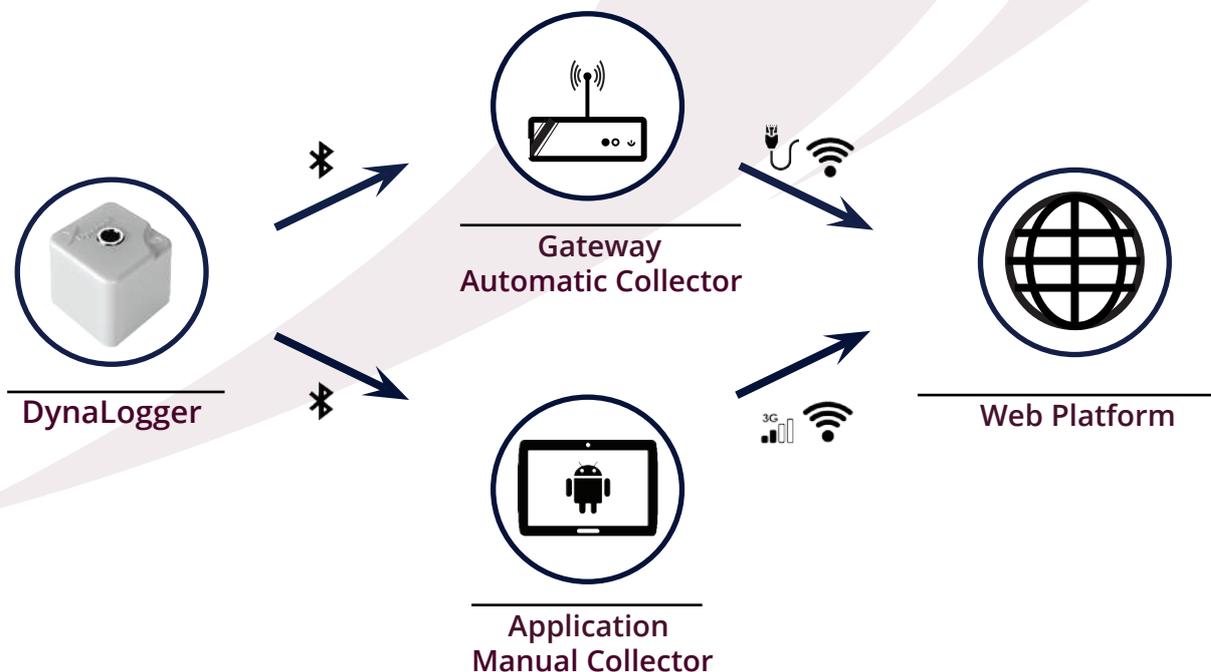


Figure 01 - Solution operation

The flowchart below shows a basic step-by-step outline of how the solution works:

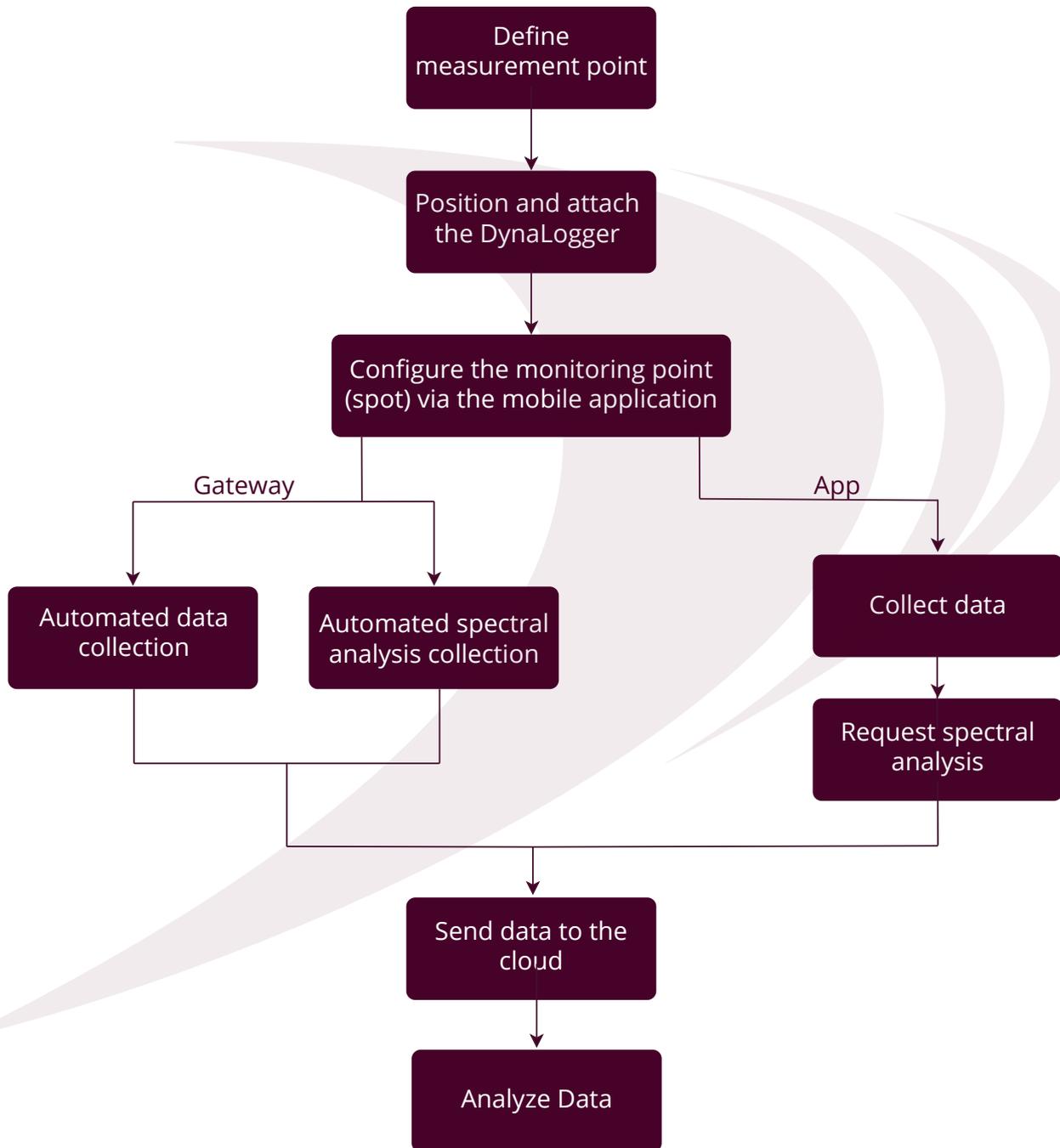


Figure 02 - Solution operation

This manual is intended to guide the user through the initial steps, from the positioning and attachment of the Dynalogger, to the installation of the App and Web Platform access.

2 Positioning

The first step, in the case of explosive atmospheres, is to consult possible restrictions on the product datasheet.

Then, the device should be positioned on the machine or equipment to be monitored.

The vibration and temperature measurements should be taken on rigid parts of the machine, so that signal and temperature measurements are not impaired. Avoid installation on fins and parts of the fuselage as they may have localized resonance, signal attenuation and heat dissipation. The device must also be positioned on a non-rotating part of the machine.

Since the DynaLoggers take readings on three orthogonal axes, they can be installed in any angular direction. However, it is recommended that one of the axes (X,Y,Z) be aligned with the machine shaft.

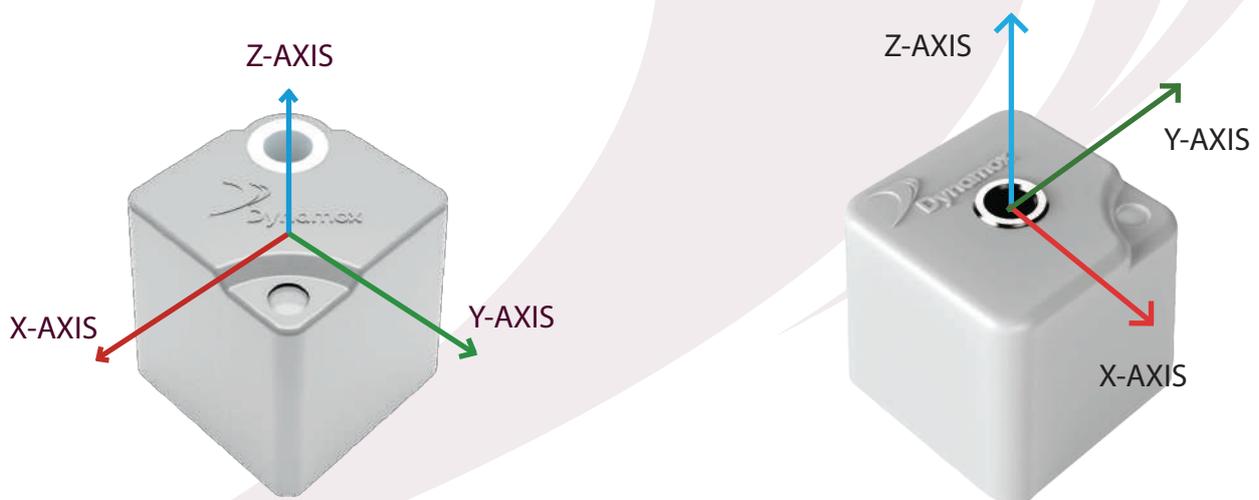


Figure 03 - Orientation of DynaLogger axes
DynaLogger TcA (left) - DynaLogger HF or AS (right)

Figure 3 shows the orientation of the DynaLogger axes. This can also be seen on the label attached to the devices.

The correct positioning of the device should take into account the axis and orientation of the machine. Figure 4 shows a DynaLogger positioned on an electric motor.

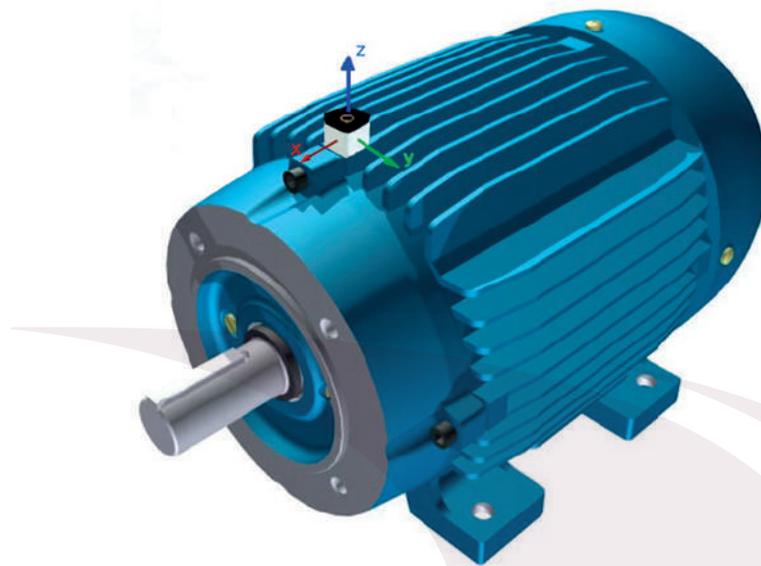


Figure 4 - Positioning of DynaLogger on an electric motor
(X - Axial; Y - Horizontal; Z - Vertical)

To determine the quantity of devices to be installed on a machine, some factors should be taken into consideration:

- **Complexity of the equipment:** complex equipment with a higher number of components, such as bearings and shafts, may require a greater number of measurement points.
- **Criticality of the machine:** the more critical the equipment is for production, the closer it should be monitored.
- **Reliability of the machine:** if a machine is historically unreliable, additional monitoring points could be desirable.

2.1 Good Practices

The following examples demonstrate best practices when installing the devices.

1) The DynaLogger should be installed on a rigid part of the machine avoiding localized resonance and other interferences (Figure 5);

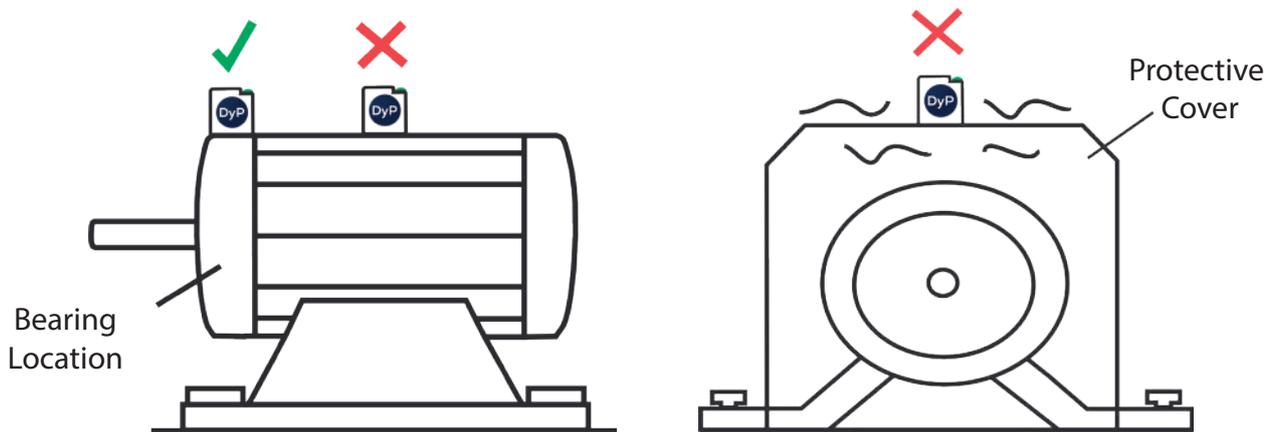


Figure 5 - Positioning on rigid parts of a machine

2) The DynaLogger should preferably be centralized in relation to critical components, such as bearings. (Figure 6);

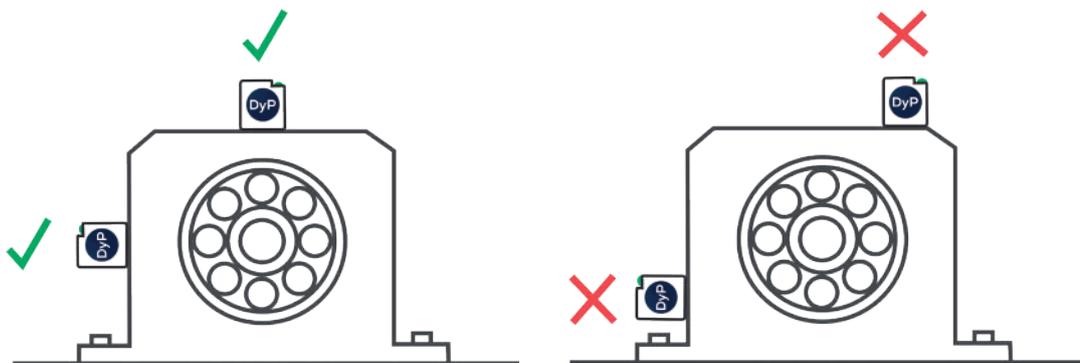


Figure 6 - Centralized positioning

3) It is recommended that the DynaLogger is kept in a fixed position to enable more accurate analysis;

4) The surface of the monitoring point should function within the temperature limits of the DynaLogger (-10°C to +84°C). Using the DynaLogger in conditions outside of the specified limits will invalidate the product warranty;

3 Attachment

The attachment method is one of the most critical factors for measuring vibration. A rigid attachment is essential for avoiding false readings and data.

Depending on the type of machine and position, different attachment methods could be used. To get the best results from the DynaPredict solution, screw fixing is recommended. To do this, the installation surface must be prepared first, as described below.

Drilling the machine

Drill a threaded hole with an M6x1 threaded tap (supplied in kits with 21 DynaLoggers) at the point of measurement, at least 15mm deep.

Cleaning

Using a wire brush or fine sandpaper, clean any solid particles and scale on the surface of the measurement point.

After surface preparation, the DynaLogger attachment process should begin:

DynaLogger attachment

Position the DynaLogger at the measurement point so that the base of the device is completely supported by the installation surface (Figure 7). Once this is done, tighten the screw and spring washer* supplied with the product, applying a tightening torque of 11Nm.

Obs: consider the desired orientation of the DynaLogger axes (shown on the product label), keeping one of them aligned with the machine's axis of rotation

* Use of the spring washer is critical to achieving reliable results

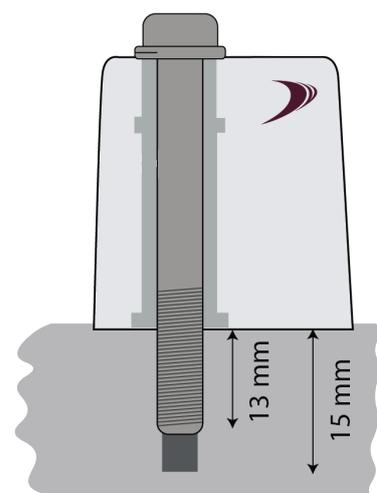


Figure 7 - Screw attachment

Some cases of installation require greater care when attaching the device (Figure 8). In such cases, installing with epoxy resin together with the screw may be beneficial. For example:

- Attaching to curved surfaces, i.e. where the base of the DynaLogger will not be fully supported at the point of contact;
- Attaching to part of a machine that does not allow a hole depth of at least 15mm;
- Attachment where the Z-axis of the DynaLogger is not positioned vertically in relation to the ground.

In these cases, chemical cleaning should also be done in addition to the traditional surface preparation described above.

Chemical Cleaning

Using an appropriate solvent, remove any oil or grease residue that may be present at the installation location.

After surface preparation, the epoxy adhesive preparation should begin:

Preparation of Epoxy Adhesive

Prepare approximately 2 cm³ of two-part epoxy resin, according to the manufacturer's instructions. Use of gloves is recommended.

Finally, attach the DynaLogger:

DynaLogger attachment

Distribute the epoxy resin paste over the bottom surface of the DynaLogger, according to Figure 8, keeping a clearance of approximately 2mm from the metal pin to avoid interference with the temperature measurement.

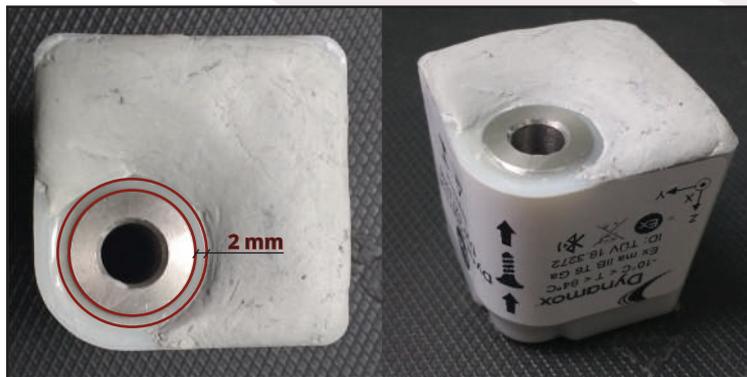


Figure 8 - Correct distribution of epoxy adhesive

Press the DynaLogger at the measurement point, orienting the axes as appropriate (shown on the product label). Once this is done, tighten the screw and spring washer supplied with the product applying a tightening torque of 11Nm. Press any leftover epoxy paste against the walls of the DynaLogger for better fixation.

Other cases may restrict the option to use the screw attachment method completely, such as:

- When it is impossible to drill a hole in the machine;
- When the surface has a thin wall or gap with little contact area for the screw.

In these situations, the adhesive method can be used as an alternative to the screw method.

4 Application

To be able to register DynaLoggers, take instantaneous vibration and temperature readings, get graphs with current data and request spectral analysis, access to the DynaPredict App is required.

To do this, simply search for “DynaPredict” in the Google Play Store and install the app.

On the App login screen (Figure 9), the user’s access credentials will be requested. If access credentials are still required, please contact Dynamox.

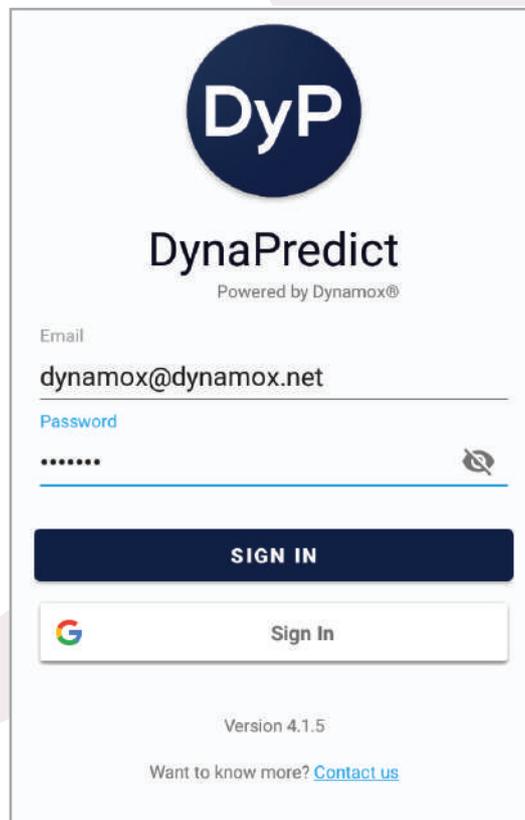


Figure 9 - App login screen

From here the user can enter the app and begin interacting with DynaLoggers. To learn more about the App and its features, refer to the “DynaPredict App” manual.

5 Web Platform



A Web Platform is available to access historical vibration and temperature measurements collected by the DynaLoggers.

To gain access, simply go to the login screen (Figure 10) via the link: <https://dyp.dynamox.solutions> and login using the same credentials as the App.

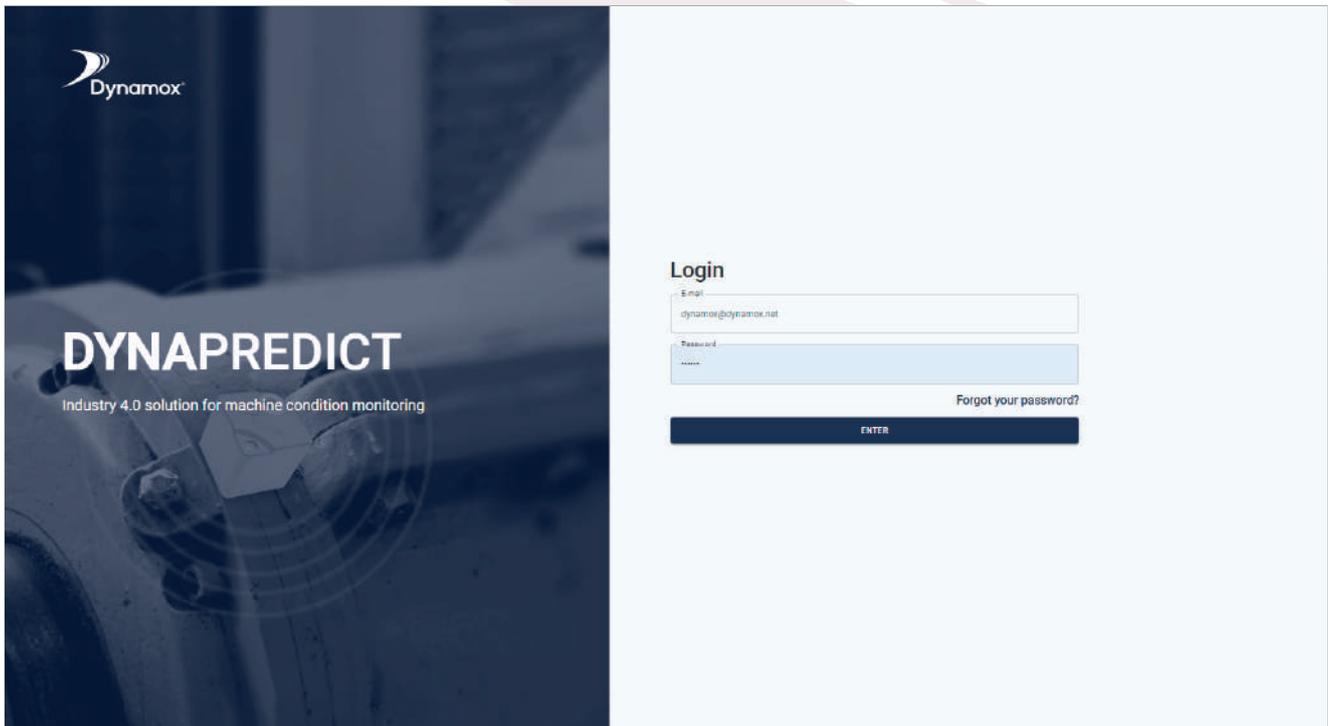


Figure 10 - Web Platform login screen

Once the Web Platform has been accessed, data from all of the registered DynaLoggers can be consulted. To learn more about the Web Platform and its features, refer to the “DynaPredict Web Platform” manual.

6 Gateway



The function of the Gateways is to automatically collect data from the DynaLoggers within Bluetooth range and send it directly to the Web Platform, as well as allowing the scheduling of spectral analysis.

Please note that a Gateway does not eliminate the need for the App, as it only allows the initial configuration of DynaLoggers. It is an important part of optimizing the data collection process.

To learn more about the Gateway and its features, refer to the "DynaGateway" manual.



FCC STATEMENT

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference.
- (2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

IC STATEMENT

This device complies with Industry Canada licence-exempt RSS standard(s)

Operation is subject to the following two conditions:

- (1) This device may not cause interference, and
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End user must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Ce dispositif est conforme aux normes autoriser-exemptes du Canada RSS d'industrie

L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Cet équipement est conforme avec l'exposition aux radiations IC définies pour un environnement non contrôlé. L'utilisateur final doit respecter les instructions de fonctionnement spécifiques pour satisfaire la conformité aux expositions RF. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec une autre antenne ou transmetteur.



Dynamox

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