VIB360 USER

MANUAL



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### 1.0 Introduction

The VIB360 embedded system is designed for the acquisition of vibration measurements (accelerometers) and acyclism measurements (speed sensors) to establish an automatic mechanical diagnosis of piston engines and rotating machines.

This system has the particularity to embed the "intelligence" in the acquisition box allowing to perform a mechanical diagnosis in an autonomous way (stand-alone) at the foot of the machines The objective of this document is to explain the functionality of the Vib360 Software User Interface(UI).

In the document, the hardware is often referred to as Vibox and the software is referred to as Vib360.

# 2.0 Establishing Connection between Vibox & your PC

No specific software is required to access the Vib360 results in the Vibox. The Vib360 software results can be visualised on your PC browser(Chrome/ Firefox) with a LAN connection from Vibox to the PC. To establish a connection, the PC's IP address must be in the same series as of the Vibox.

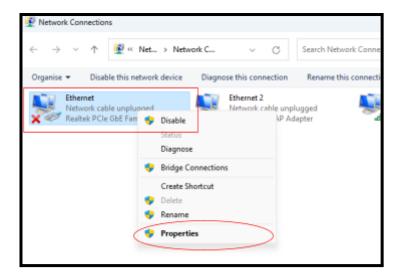
The default IP address of the Vibox is 192.168.0.10.

To update the IP address of the PC, follow the below steps:

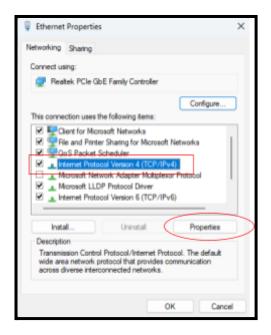
	Windows 8	Windows 10	Windows 11
Step 1	Select the start button, Type View network connections	In the search box on the taskbar, type View network connections	Search for Network & Internet in the Taskbar search box.
Step 2	Select view network connections in the list.	Select View network connections at the top of the list.	Under Related settings, click 'More Network adapter settings'

Step 3: Right-Click on the Ethernet connection you would like to update and then click properties.





**Step 4:** In Network Section, select "Internal Protocol version 4(TCP/IP 4)" and click properties **Step 5:** Select "Use the following IP" and update the IP address and subnet mask.





For Vibox IP: 192.168.0.10.

The IP address of the PC must be as follows:

PC IP : 192.168.0.1

Subnet mask: 255.255.255.0

**Note:** After using the Vibox for demo or trial purposes, do not forget to restore the IPv4 Settings. If the PC is already provided with a LAN connection for the internet, the Vibox IP can be changed to match the IP series of the PC. The Internet to the Vibox will be useful to publish data to the IoT. More details are available in the Section "10.2 Network Settings".



### 3.0 Vib360 User Interface

Once the Vibox connection is established, the Vib360 user interface can be accessed by browsing the Vibox's IP address in the connected PC.

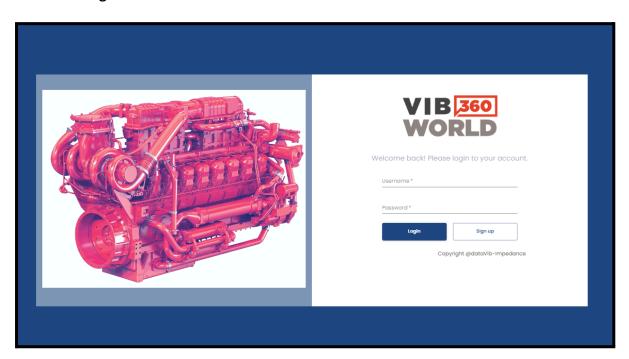
# **Prerequisites:**

- The PC must be equipped with the Ethernet/LAN port to connect to the Vibox.
- The IP address of the Vibox & the PC must be in the same series as explained in the section 2.0
- Standard browsers like Chrome/Firefox must be installed on the PC.

To access the Vib360 User Interface, Open Chrome browser and type the IP address of the Vibox(Eg. 192.168.0.10)

You will land on the Login page of the Vib360.

# 3.1 LOGIN Page

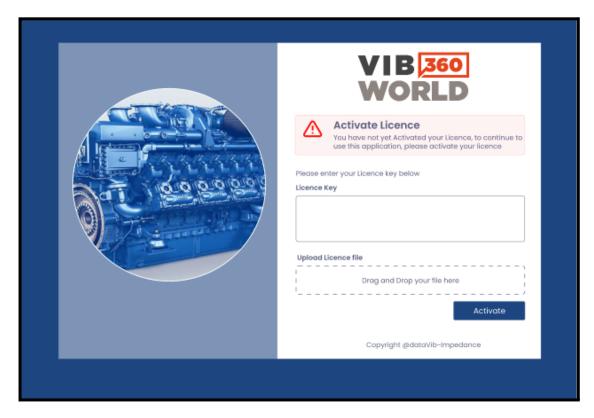


Username: client

Password: GuVI5=CDH2^b6}Hb



### 3.2 Activate Licence



To configure the Vib360 for your equipment diagnostics and to visualise the data, a license must be activated. To obtain the license key, please contact Impedance dataVib.

Drag and drop the license key provided to you and activate the User Interface in Vibox.

Once the license is activated, You will land in the Configuration Page(Section 3.4).

The activated license details will be displayed in the System Page(Section 3.5) WORLD

# 3.3 Vib360 User Interface Index Menu

VIB360 User Interface contains the following modules as the index menu:

- Dashboard
- Trends
- Downloads
- Auxiliary data
- Configuration
- System
- Settings





# 4.0 Configuration

Vib360 Software must be configured to perform the diagnostics of the specific equipment.

Configuration contains two sections:

- → Manage Configuration
- → Edit Configuration.

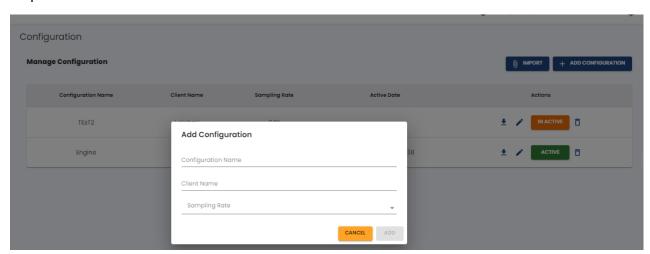
### A. Manage configuration:

It contains the library of configurations created inside the Vibox. However, at any point in time, only one configuration can be active.

In this section, we will start by adding a configuration:

Step-1: Click Add Configuration. Add Configuration Pop Up screen appears.

Step-2: Add Configuration Name, Client Name and Select Sampling Rate(64K) from the drop-down menu.



**Note:** A configuration can also be imported from one Vibox to Another, provided they have the same active modules in the license files.

### **B. Edit Configuration:**

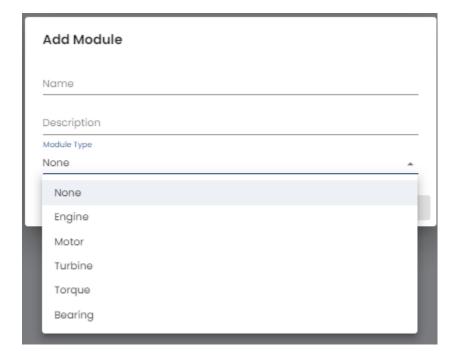
The Configuration created shall be edited as per the diagnostic requirements of an equipment.

As per the license provided, you will have access to the modules(with count) provided in the System page.

Step1: Click Edit for the respective configuration file created above.

Step2: Click Add Module.





- Step 3:Add Name, Description and Select Module Type.
- Step 4: Follow the steps provided below to configure the respective module.
- Step 5: Once the configuration is completely edited, the same must be activated by clicking the inactive/active button.



To guide the user for the configuration, many tooltips or messages are provided throughout.

### Note:

Based on the activated license key, one or more of each module can be configured in the same configuration file. For more details on the modules available under the activated license key, refer to the section 9.4 Activated Modules.



#### **4.1 ENGINE Module**

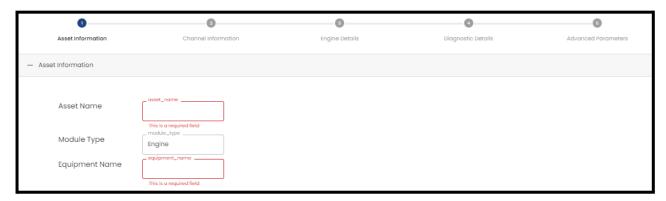
This module contains 5 sub-sections. Each subsection must be filled with appropriate data to go to the next subsection.

i. Asset Information: Provide Asset Name & Equipment Name under Asset Information section.

For Eg:

Asset Name: Tug Boat A (or Vessel Name)

**Equipment Name: PORT ENGINE** 



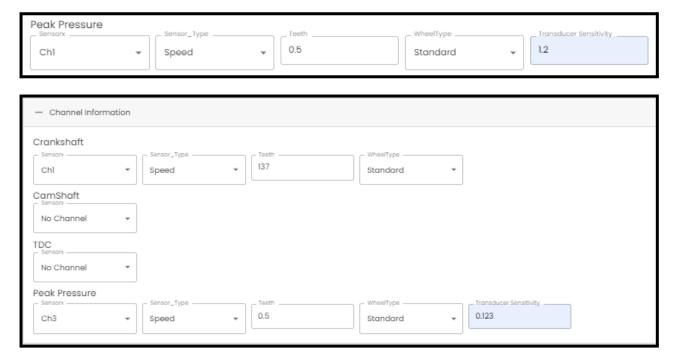
### ii. Channel Information:



- a. Crankshaft Sensor is a mandatory input for the Engine diagnostics.
  - Select Channel Assigned for that sensor in the Vibox.(Eg. Channel 1).
  - Select Sensor Type as Speed
  - Enter the number of teeth on the flywheel.
  - Select the WheelType from the drop-down menu.
- b. In order to pin-point the faults in Engine, TDC or CAM reference will be required. Either CAM or TDC will be selected and filled with the required information based on the installation feasibility. (Note: Only one of the above two can be selected)



c. Peak Pressure Sensor: If Peak Pressure sensor is installed, then it must be configured as shown below(**Transducer Sensitivity in mV**). Peak Pressure sensor can also be referenced for the CAM signal. Hence, if peak pressure is configured, No need to configure TDC or CAM.



### iii. Engine Details:

In this subsection, tooltips(?) have been provided to assist the user to fill in all the required Engine Details



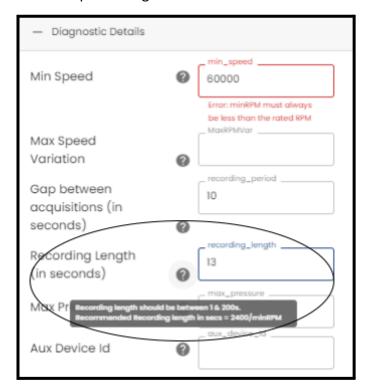
Impedance DataVib



Note: The Rated RPM will be used as the scale for the RPM gauge in the dashboard.

### iv. Diagnostic Details:

In this subsection, Along with tooltips(?)Suggestions & Error messages have been provided to assist the user to fill in all the required Diagnostic Details as shown below:



Then click 'Save' to save your configuration.

Click "Add Module" to add more equipment to diagnose.

### 4.2 Motor Module

This module contains 4 sub-sections. Each subsection must be filled with appropriate data to go to the next subsection.

i. Asset Information: Provide Asset Name & Equipment Name under Asset Information section.

For Eg:

Asset Name:Genset A

**Equipment Name: Alternator** 

### ii. Channel Information:

Only one MPU/Transducer sensor is sufficient for Motor Diagnosis.

If MPU sensor is installed: Select sensor\_type as Speed, Enter Teeth & Select wheel Type as shown below:



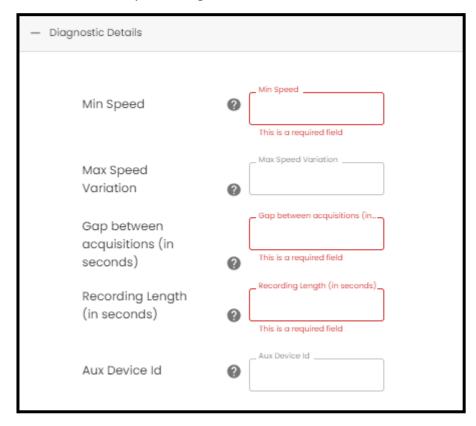


If Transducer/Accelerometer is installed: Select sensor\_type as Transducer, Enter the transducer details as required.



# iii. Diagnostic Details:

In this subsection, Along with tooltips(?)Suggestions & Error messages have been provided to assist the user to fill in all the required Diagnostic Details as shown below:



### iv: Machine details:

In this subsection, fill in the details of Equipment being monitored. The Rated RPM is taken as the Max RPM Scale for RPM Indicator





Then click 'Save' to save your configuration.

Click "Add Module" to add more equipment to diagnose.

### 4.3 Turbine Module

This module contains 4 sub-sections. Each subsection must be filled with appropriate data to go to the next subsection.

i. Asset Information: Provide Asset Name & Equipment Name under Asset Information section.

For Eg:

Asset Name: WindMillA

**Equipment Name: Turbine** 

#### ii. Channel Information:

Only one MPU/Transducer sensor is sufficient for Turbine Diagnosis.

If MPU sensor is installed: Select sensor\_type as Speed, Enter Teeth & Select wheel Type as shown below:



If Transducer/Accelerometer is installed: Select sensor\_type as Transducer, Enter the transducer details as required.

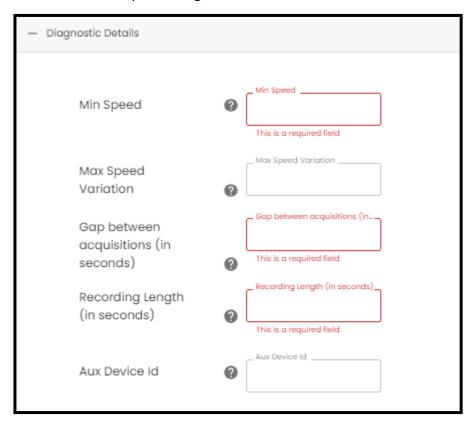


Tel: +33 169351525 | Email: support-vib360@impedance.fr | Website: www.vib360world.com



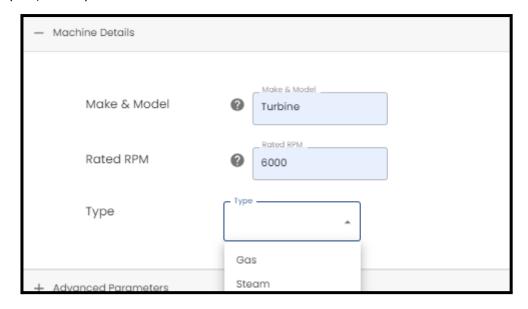
# iii. Diagnostic Details:

In this subsection, Along with tooltips(?)Suggestions & Error messages have been provided to assist the user to fill in all the required Diagnostic Details as shown below:



### iv: Machine details:

In this subsection, fill in the details of Equipment being monitored. The Rated RPM is taken as the Max RPM Scale for RPM Indicator. In the case of Turbine, the Type of fuel must be selected.(Gas/Steam).





Then click 'Save' to save your configuration.

Click "Add Module" to add more equipment to diagnose.

### 4.4 Torque Module

This module contains 4 sub-sections. Each subsection must be filled with appropriate data to go to the next subsection.

i. Asset Information: Provide Asset Name & Equipment Name under Asset Information section.

For Eg:

Asset Name: Tug Boat

Equipment Name: Propeller Shaft

### ii. Channel Information:

Two parallelly installed sensors facing the pole bands on the shaft at a distance of 3.5 times of the Diameter of the propeller shaft is required for the Torque measurement.

The two channels must be configured as shown below:

The no of teeth and the wheelType of both sensors must be the same.

— Channe	nel Information		
	DE Channel  Sensor  Ch3   NDE Channel	Speed  Field should be same for DE and NDE  The no of teeth for both channels DE & NDE must be same.  Wheel_Type  Standard  Field should be same for DE and NDE  Field should be same for DE and NDE	
	Sensorx  This is a required field	Sensor_Type  This is a required field	

### iii. Diagnostic Details:

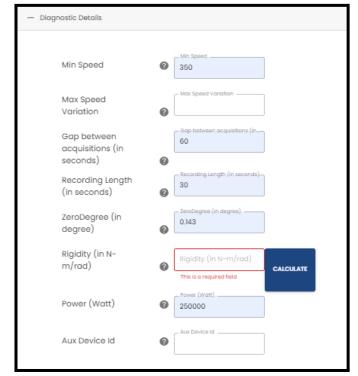
In this subsection, Along with tooltips(?)Suggestions & Error messages have been provided to assist the user to fill in all the required Diagnostic Details as shown below:

A Popup for the Rigidity calculus is provided in the section:

Torsional Rigidity modulus of the Shaft being monitored can be calculated by inputting the following values: Outer Diameter(m) of the shaft, Inner Diameter(m) of the shaft, Shear modulus(G) of the shaft, Length(m) between the two pole band centers.



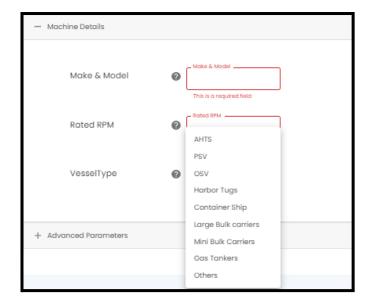




# iv. Equipment Details:

Along with Make, Model & RPM, Vessel Type must be provided.





Then click 'Save' to save your configuration.

Click "Add Module" to add more equipment to diagnose.

### 4.5 Bearing Module

This module contains 4 sub-sections. Each subsection must be filled with appropriate data to go to the next subsection.

i. Asset Information: Provide Asset Name & Equipment Name under Asset Information section.

For Eg:

Asset Name:Roll Mill

**Equipment Name: Bearing** 

### ii. Channel Information:

Only one MPU/Transducer sensor is sufficient for Motor Diagnosis.

If MPU sensor is installed: Select sensor\_type as Speed, Enter Teeth & Select wheel Type as shown below:



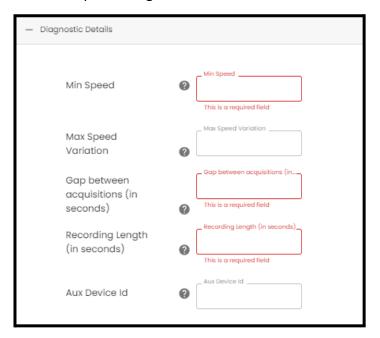
If Transducer/Accelerometer is installed: Select sensor\_type as Transducer, Enter the transducer details as required.





# iii. Diagnostic Details:

In this subsection, Along with tooltips(?)Suggestions & Error messages have been provided to assist the user to fill in all the required Diagnostic Details as shown below:



### iv: Machine details:

In this subsection, fill in the details of Equipment being monitored. The Rated RPM is taken as the Max RPM Scale for RPM Indicator



Then click 'Save' to save your configuration.

Click "Add Module" to add more equipment to diagnose.



### 5.0 Dashboard

Dashboard overview: It contains the following 6 sections:

- 1. Alerts & Instructions
- 2. Global Indicators
- 3. Trends
- 4. Live Diagnostic Status
- 5. Signal Status
- 6. Download Latest Reports

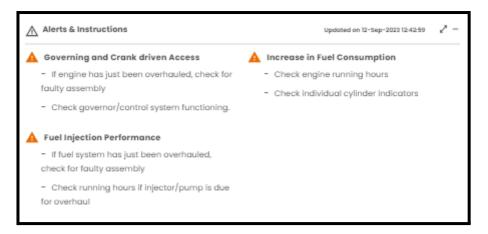


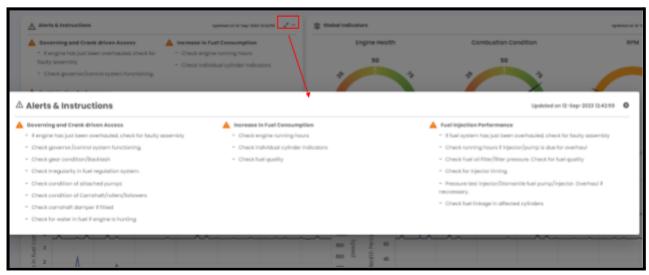
The sections 4,5,6 are by default in minimized mode as shown above. These sections can be extended using or maximized to full screen using options.

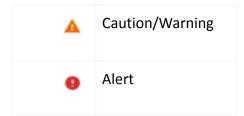
### 5.1 Alerts & Instructions

Alerts and instructions are carefully crafted, taking into account the equipment's(Engine/Motor/Turbine/Bearing) health during a day of operation.









For the Torque Module, the Status Alerts will appear in the case of any disruption in the Torque measurement as follows:





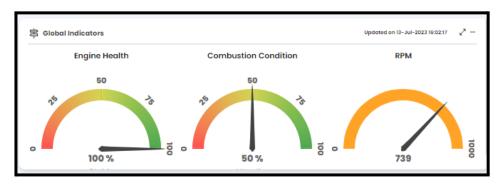
### 5.2 Global Indicators

Global Indicators are provided in the Dashboard with a minimum of 3 indicators displayed. To view all or more indicators, select the extended view option at the top right corner.

The indicators are displayed as follow:

### A. Engine module:

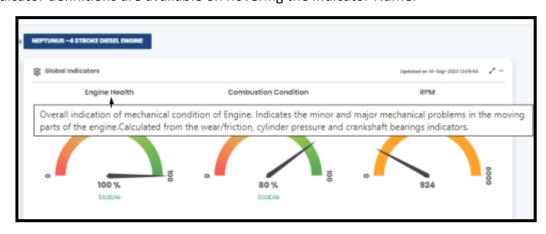
Global Indicators are: Engine Health, Combustion Condition, RPM



In the extended view: along with global indicators,



The indicator definitions are available on hovering the indicator Name.





Cylinder Specific Indicators: Compression Condition, Injection Condition, Bearing Condition, Condition of Cyl Moving Parts, Misfiring(Gas Engine Only)



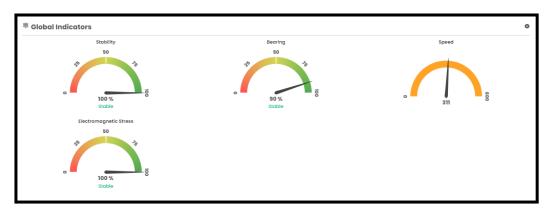
Note: In the case of Gas Engines, Misfiring indicators for all cylinders are also displayed here.

# **B.** Motor Module

Global Indicators: Stability, Bearing, Speed, Electromagnetic stresses

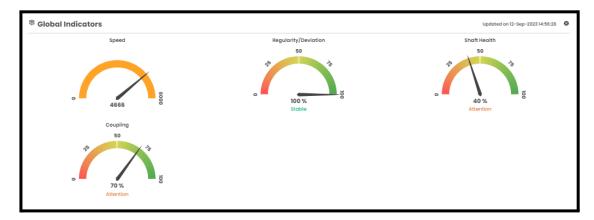


# Extended View:

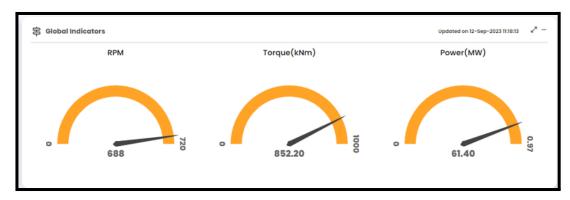




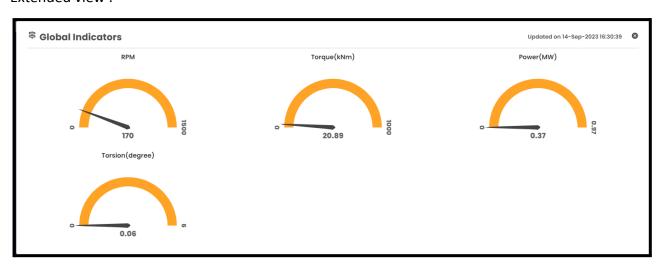
# C. Turbine Module: Regularity Deviation, Shaft Health, Coupling/Alignment



# D. Torque Module: Speed, Torque, Power

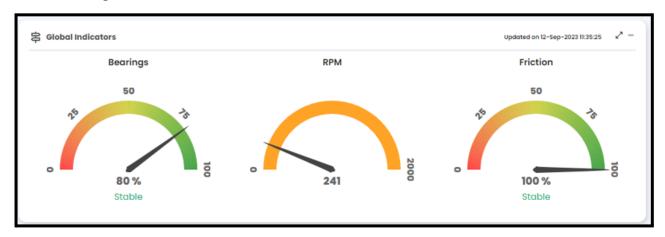


# Extended view:

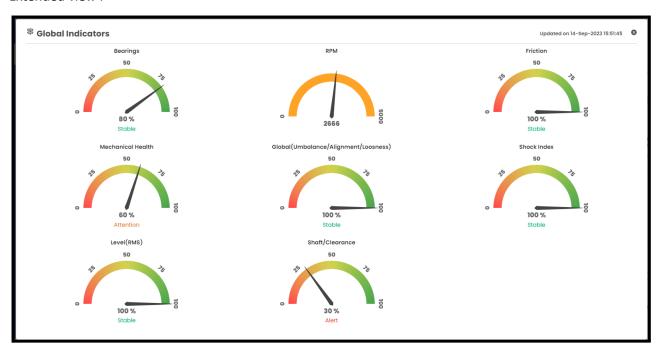




# E. Bearing Module

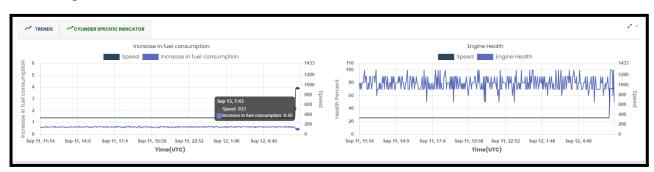


### Extended view:



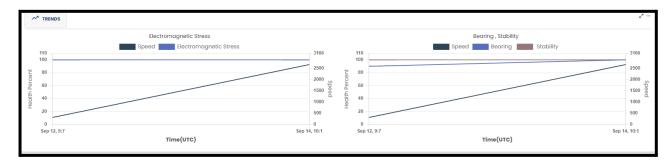
# 5.3 Global Indicator Trends

# A. Engine Module

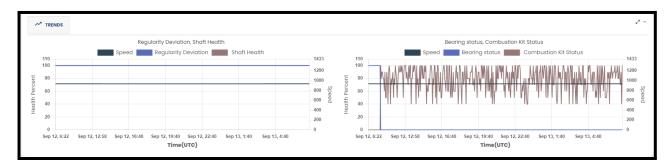




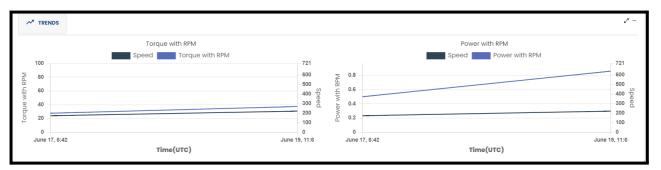
# B. Motor Module



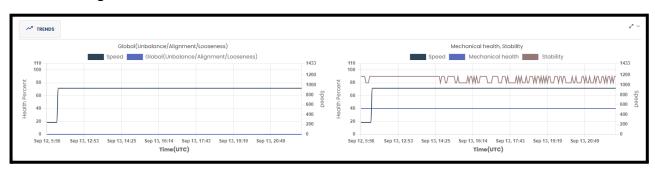
### C. Turbine Module



# D. Torque Module

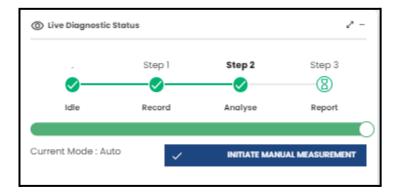


# E. Bearing Module





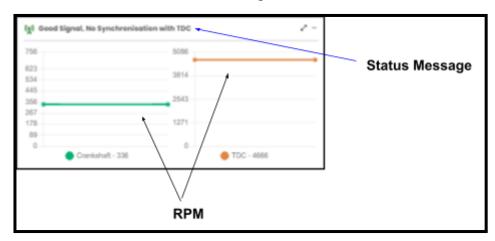
# **5.4 Live Diagnostic Status**



Live Diagnostic status indicates the step at which the current diagnosis is, It has steps such as Idle, Record, Analyse, and Report. The Green Line implies the progression of Diagnosis. The *INITIATE*MANUAL MEASUREMENT toggle in blue is used to initiate the manual measurement.

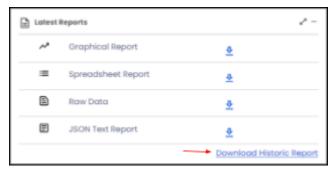
# 5.5 Signal Status

The section below details the status code of the signal.



### **5.6 Download Latest Reports**

Reports can be downloaded in different formats such as Graphic, Spreadsheet, Raw Data, and JSON as shown below.



Impedance DataVib



### **Image 15.** Latest Reports

The complete historic report can be downloaded from *Download Historic Report* indicated with the red arrow.

#### 5.7 UTC Time Window & Alert

- 1. Real-time date is shown in UTC.
- 2. A Notification Bell is provided to alert the following:
- a. Licence is about to expire
- b. A report or data file is ready to be downloaded
- 3. The modules configured in the Configuration are displayed on the dashboard in different Tabs.

### 6.0 Trends

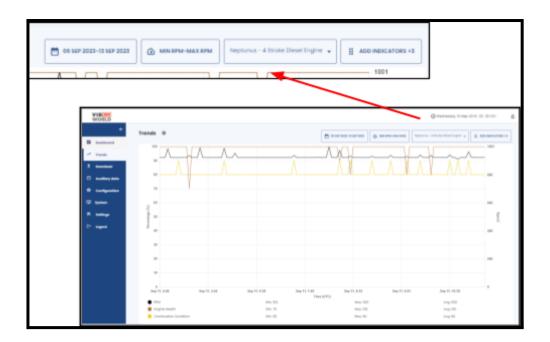
The Trends module is used to visualise the trends of selected indicators for an equipment for a selected period of time.

The trends module can be useful:

- To compare different indicators of the Equipment
- To check Equipment health indicators at a specific speed range.
- To select different equipment data trends.
- To zoom in or out of the trends range.

**Note:** To get the proper trend results, it's important to select the Time period first, followed by the list of indicators to be seen, then the Speed Min & Max.

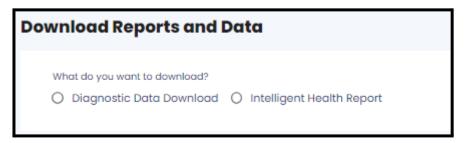




### 7.0 Download Data

Download Data contains 2 sub-sections:

- 1. Diagnostic Data Download
- 2. Intelligent Health Report

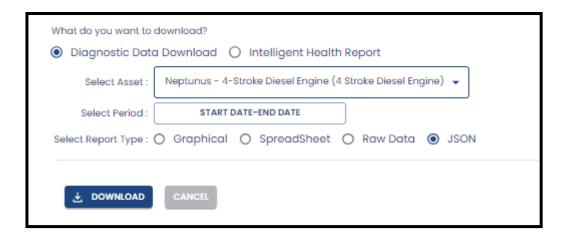


# 7.1 Download Diagnostic Data

The diagnostic data (the output from the Vib360 software) is available to download in the following formats for individual equipment for a selected time period.

- a. PNG Report
- b. XLSX or Spreadsheet
- c. JSON format
- d. RAW file format Usually used to share with Impedance dataVib for depth analysis.





### 7.2 Intelligent Health Report

The summarised Health report with intelligence is available to download in PDF format.



**Note:** Based on the time period and the format selected, the downloading may take a couple of minutes. Once the request is made, you will be notified to download the file into your local PC with the notification bell at the top right corner.

You will have to download the files only at the Notification Bell Icon.

Additionally, a Download History feature is provided to check the status of your downloads.

The Download History option to be clicked to see the complete history of downloads.

Download history contains request ID, request Time, Complete Time, Start and End Date of data being downloaded, the format of the report, and status of the download, with the completed one being in black, ongoing being in blue, and the failed or error being in red.

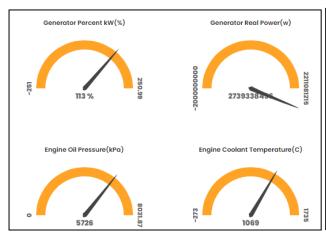
CLEAR DOWNLOAD QUEUE can be used to clear the queue.

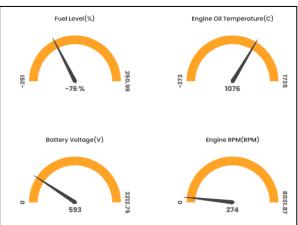
It is to be noted that download history is only to provide the status of your Download request.

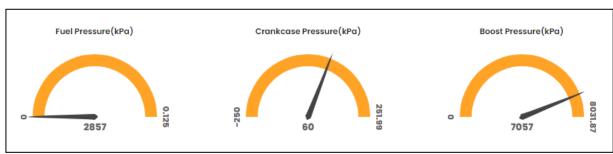


# 8.0 Auxiliary Data

The Auxiliary Data module provides additional data about engine health using various indicators collected from the ECM as shown below.







The Auxiliary Indicators are available for Engine Module Only. They are as follows:

Generator Percent kW(%) Generator Real Power(W)

Engine Oil Pressure(kPa) Engine Coolant Temperature(°C)

Fuel Pressure(kPa) Crankcase Pressure(kPa)

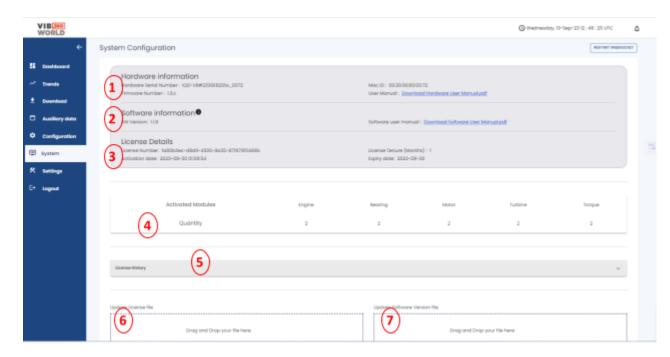
Boast Pressure(kPa) Fuel Level(%)

Engine Oil Temperature(°C)

Battery Voltage(V)



### 9.0 System



System Configuration has information about Hardware, Software and License.

### 9.1 Hardware information

### Consists of:

- a. Hardware serial number i.e., the VIBOX serial number
- b. Vibox Firmware Number
- c. MAC Address of the Vibox
- d. Hardware User Manual

### 9.2 Software information

### Consists of:

- a. Software Version
- b. Software Version Notes in the information on software versions.

### 9.3 License Details

### Consist of:

- a. License Number
- b. Tenure for the current license activation.



- c. License Activation date
- d. License Expiration date.

#### 9.4 Activated Modules

The module provides the license activation for the count of different modules.

Based on this module count, one will be able to configure the no of equipment.

### 9.5 License History

The license history is provided for the list of upcoming licenses and expired license files.

Example of an upcoming license: It stays Pending until the current license has expired and then gets itself activated.



### 9.6 Update License File

Please contact your distributor for the License File to upload.

The operation is very simple, you can drag and drop the license file to be uploaded. Once uploaded, it asks for confirmation.

Check the list of modules going to be activated and confirm.

**NOTE**: Please make sure the Vibox has a stable power supply at the time of update.

# 9.7 Update Software File

Please contact your distributor for the Software file to upload.

The operation is very simple, you can drag and drop the software file to be uploaded. Once uploaded, it asks for confirmation.

Check the software version and version notes and confirm.

**NOTE:** please make sure the Vibox has a stable power supply at the time of update.

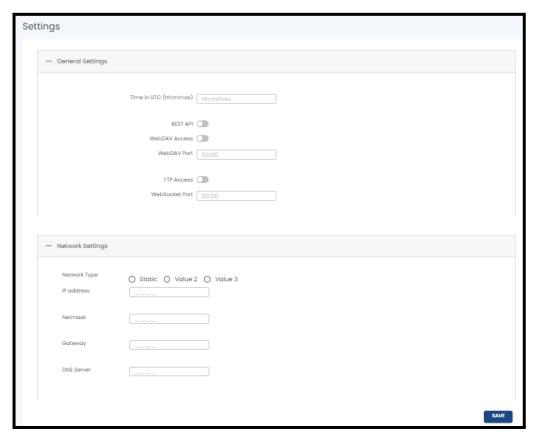


**Note:** Use the **RESTART WEBSOCKET** button at the top right corner to restart websocket when prompted.

# 10.0 Settings

There are two subsections in Settings:

- 1. General Settings
- 2. Network Settings



# 10.1 General Settings:

For Future Reference. No changes are required by the user.



### 10.2 Network Settings:

_	Network Settings	
	Network Type	O Static O Value 2 O Value 3
	Netmask	
	Gateway	
	DNS Server	

This section is used to change the IP address of the Vibox.

If the Vibox IP to be changed, select static:

**Enter New IP address** 

**Enter Netmask** 

**Enter Gateway** 

#### 11. Disclaimer

The Vib360 software is designed exclusively for condition monitoring of the equipment by conducting tests and gathering data to validate the effective functionality of rotating machinery and to facilitate the identification of potential issues. It should be emphasised that the software is not intended as a replacement for proficient mechanical and electrical troubleshooting expertise, nor should it be considered an alternative to the repair instructions found in the relevant service manuals.

The notes provided in this manual should be thoroughly reviewed by the user.

# 12. General Information

The document is presented in its current state and may undergo alterations in future editions without prior notification. To obtain the most up-to-date version, kindly get in touch with Impedance dataVib. We retain the right to implement technical revisions to illustrations and content within this manual.



Configuration of Vib360 should only be performed by individuals who are deemed qualified. By qualified personnel, we refer to individuals with a deep understanding of Vib360's operations and the requisite qualifications. It is imperative to adhere meticulously to all instructions and technical data outlined in this manual.

Impedance dataVib cannot accept responsibility for damages or malfunctions resulting from failure to follow the guidelines provided in this manual.

This instructional guide exclusively pertains to the Vib360 Software.