

PdM (PREDECTIVE MANAGEMENT SYSTEM) Application User Guide

Ver 09.10.2021



Predictive Management System

Table of Contents

<i>Introduction</i>	3
<i>Home Page</i>	4
<i>About Us Page</i>	5
<i>User Management</i>	6
<i>Admin Panel</i>	8
<i>Access Management</i>	
11	
<i>Training Models</i>	13
<i>Model Fields</i>	
14	
<i>Devices</i>	
15	
<i>Active Device</i>	16
<i>Static Page</i>	
17	
<i>Picture</i>	18
<i>Settings</i>	
19	
<i>File Manager</i>	20

- **Introduction**

PdM (Predictive Maintenance) is brought to you by the Predictive Management System Company which is incorporated in Winnipeg, the province of Manitoba of Canada as a corporation.

The Company is established in 2020 to provide a solution to save costs for the industrial companies by reducing the expert advice they have to pay for asset maintenance, as the assets themselves will tell what they need if they are unable to fix themselves automatically. The user can receive updates in real-time even remotely. Besides, they receive alerts when the machine seems to have a problem.

Using the source of Big Data, it will present an estimate of the cost along with the detected issue, which will empower the users to have an idea of the repair cost before calling in for service technician.

Our Mission:

Working with valuable industrial assets to try to increase the life of the assets and decrease the degradation period through innovation and customization and provide solutions through automation.

For more information about PdM, please go to:

www.predictivemanagementsystem.com

- **Home Page**

The production environment is dynamic, and the detection elements have to be in place to adjust set-points of the control loops in real-time. The current methods are far behind these requirements. It is necessary to use computerized systems to have an effective predictive maintenance solution and benefit from its advantage. Due to the sophisticated production methods in industries such as Oil Refineries and Petro Chemicals, a variety of assets are used and requires to gather enormous data.

We use field data from the working machine to tune a physical 3D model and create a digital twin. The twin can then be used to design a predictive maintenance detection algorithm for deployment to the controller of the actual equipment. The process is automated, enabling quick adjustment to change conditions, materials handled, and equipment configurations using Machine Learning to create the predictive maintenance algorithm. Predictive maintenance helps to extend the life of assets by identifying what may go wrong and how to prevent it. It improves the reliability of assets by increasing the rate of inspection and specifying the exact methods to sustain production through effective maintenance. It ensures safety by keeping risk as low as reasonably practicable (ALARP).

Our apps are estimated to reduce Maintenance costs by 50%,

Unexpected failures by 55%,

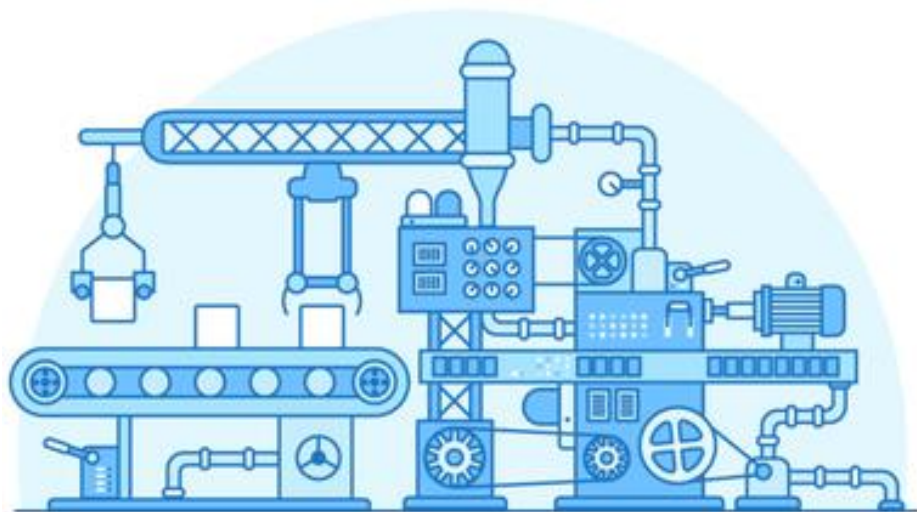
Repair and overhaul time by 60%,

Spare parts inventory by 30%,

While increase 30% in machinery mean time between failures (MTBF) and 30% increase in uptime.



- **About Us Page**



Predictive Maintenance

PdM (Predictive Maintenance) is brought to you by the Predictive Management System Company which is incorporated in Winnipeg, the province of Manitoba of Canada as a corporation. The Company is established in 2020 to provide a solution to save costs for the companies by reducing

the expert advice they have to pay for asset maintenance, as the assets themselves will tell what they need if they are unable to fix themselves automatically. The user can receive updates in real-time even remotely. Besides, they receive alerts when the machine seems to have a problem.

[Street Address] [City, ST ZIP Code]

[Telephone]

[Fax]

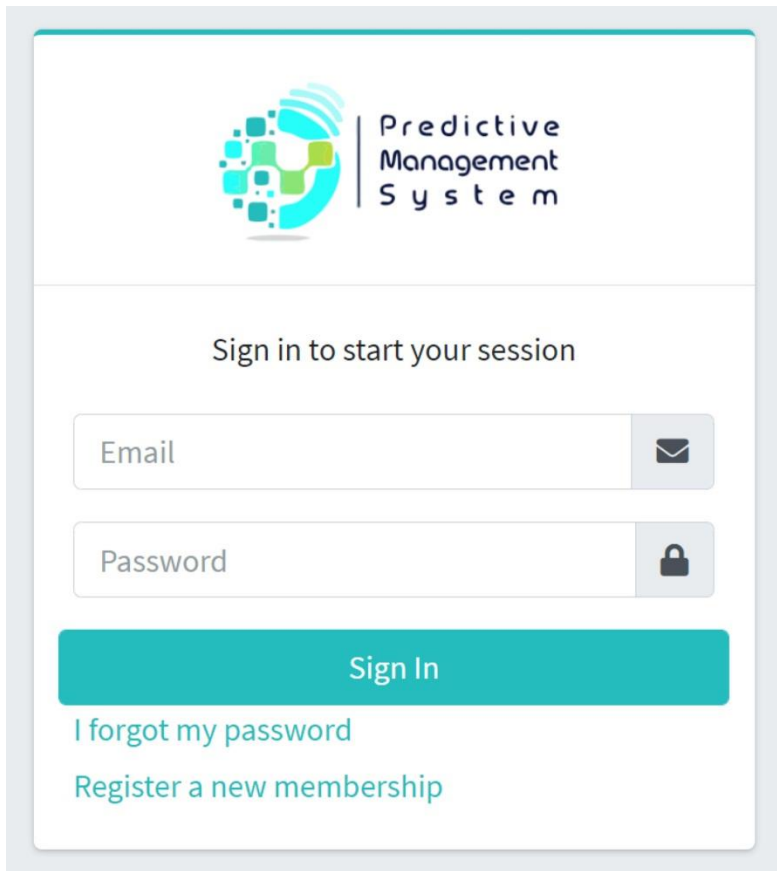
Email: info@predictivemanagementsystem.com

Web: www.predictivemanagementsystem.com

Instagram: predictive_management_system

- **User Management**

Please Login into app.predictivemanagementsystem.com



Predictive Management System

Sign in to start your session

Email

Password

Sign In

[I forgot my password](#)

[Register a new membership](#)

Users who have previously registered for the Web Application must login by:
Entering their **User Name**.
Entering their **Password**.

Selecting **Sign In** to advance to the next screen and begin using the application.


Register a new membership

Users who have not previously registered for the Web Application must select "Register a new membership" to access the "New User Registration" page.

Forgotten Passwords

If a user forgets his/her password, he/she must select "Forgotten password help."

Forgotten Password Help



Predictive
Management
System

You forgot your password? Here you can
easily retrieve a new password.

[Login](#)

User will need to enter a valid email id which was entered at the time of Registration and click on submit button to get notification about his/her Password Check your mail and login again.

New User Registration Page



Register a new membership

Firstname



Lastname



Email (Username)



Password



Retype password



I agree to the [Terms](#)

Register

[I already have a membership](#)

Users will be asked to enter or select the following information:

Name— First and Last

Enter the user's first and last name.

E-Mail

Enter the user's e-mail address. E-mail addresses are not case sensitive.

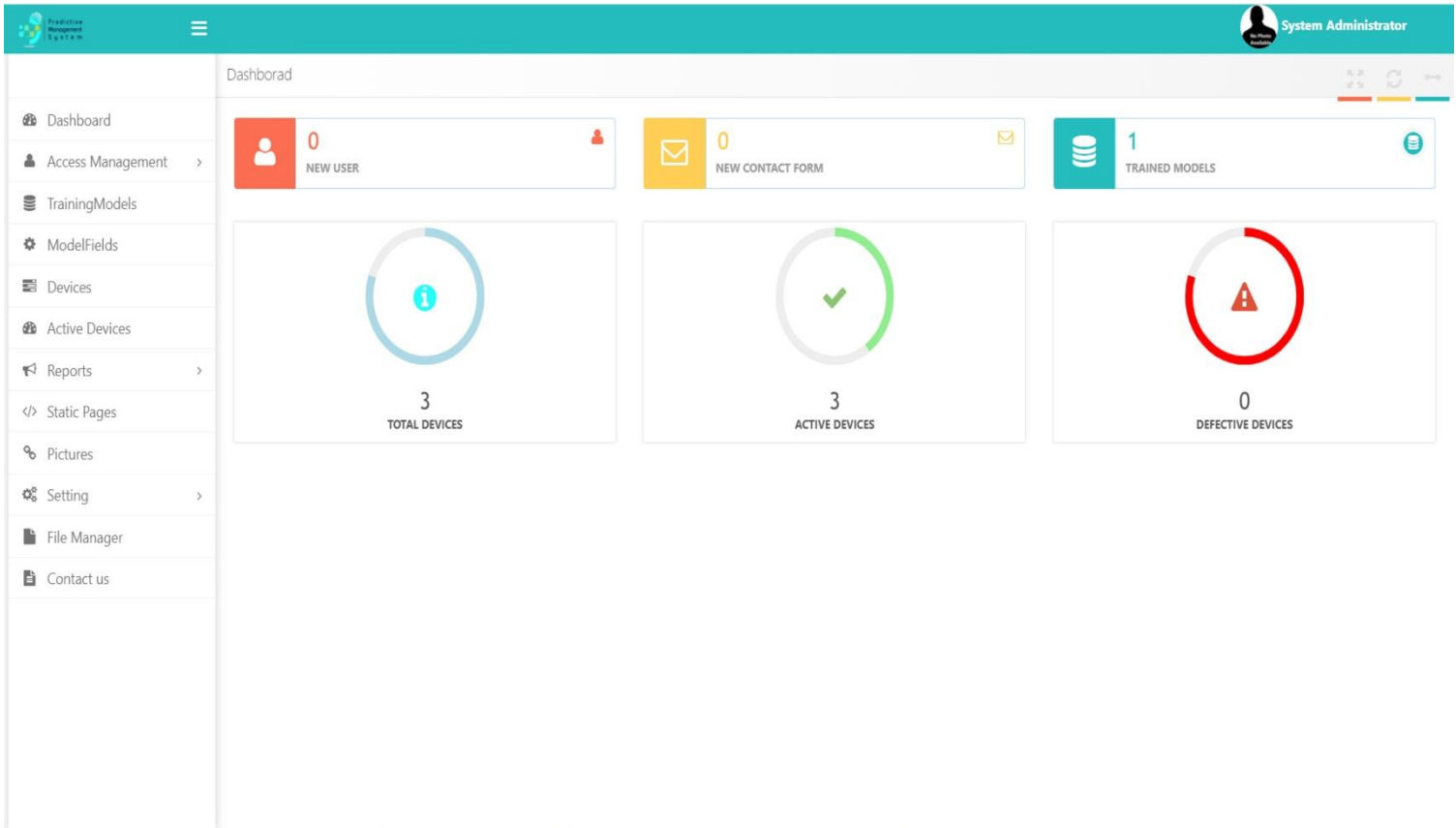
Password

Passwords must be at least eight characters long and contain at least one letter character and one numeric character. Passwords are case sensitive.

I Agree to the Terms

Check the check-box to ensure that user accepts all Terms and Conditions.

- **Main Panel**

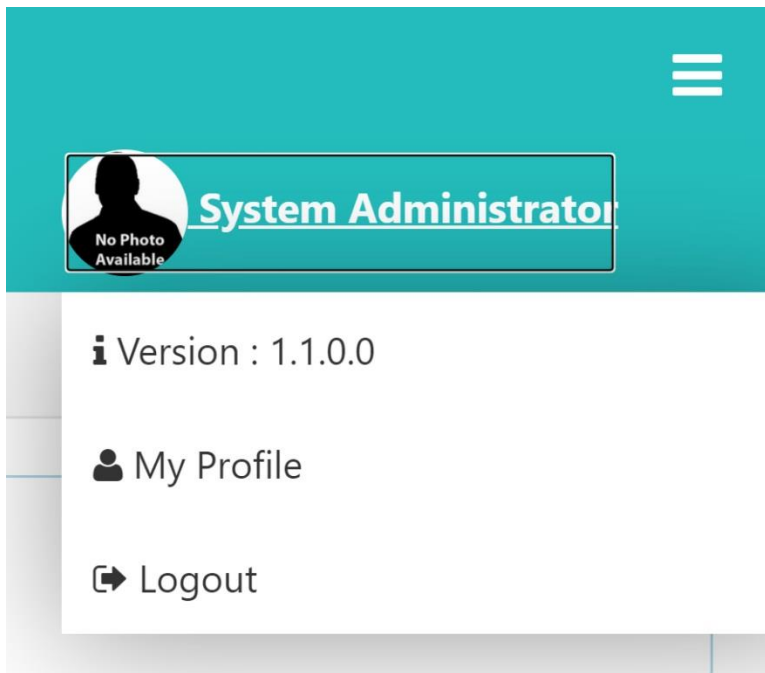


The Main Panel on the left side of the page includes following headers:

- Access Management
- Training Models
- Model Fields
- Devices
- Active Device
- Static Page
- Picture
- Settings
- File Manager

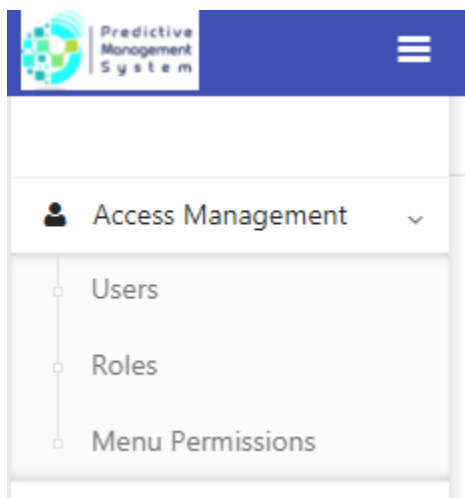
Each user, can have access according to the role(s) defined for him/her.

Now we explain each, one by one and first those used to manage the application:



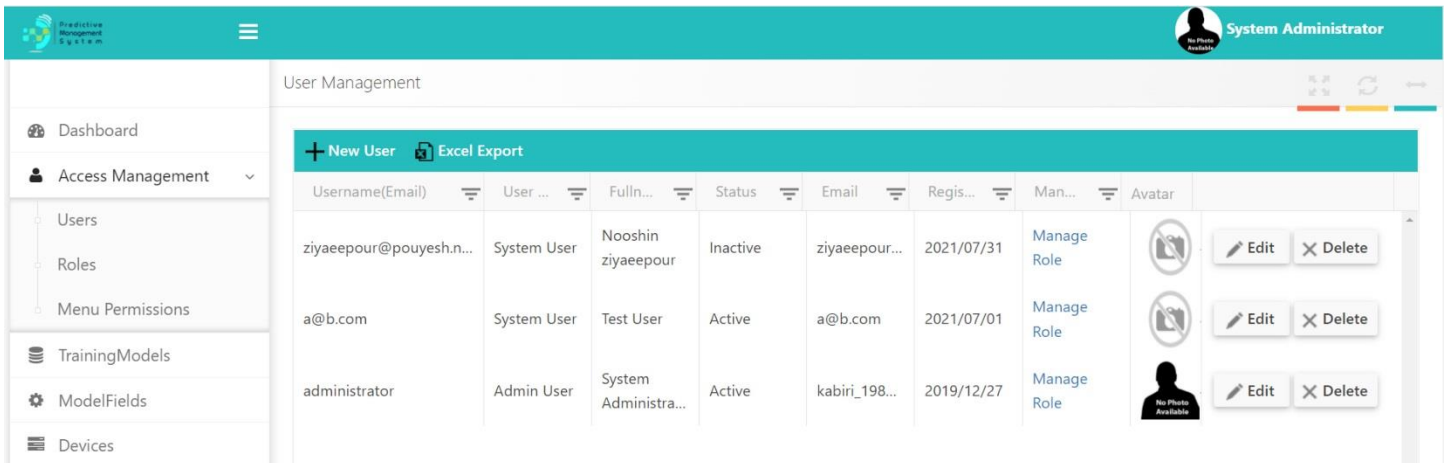
First of all, on the right side of the page, once you click on the logo icon, you may see:




- The Software Version
- My Profile: Where you can choose your Profile Icon and change your Account Info.
- Logout



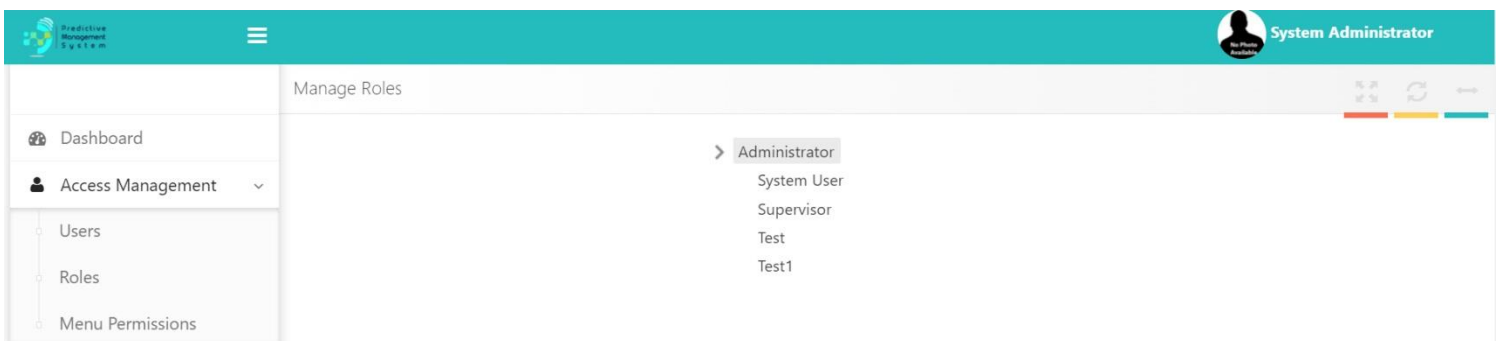
• Access Management

- Users: Where Admin can define the access level of each user. Also Edit ability is predicted there where Admin may define a range of date for each user's password validity. In the meantime, Admin may delete a user's account.



Username(Email)	User ...	Fulln...	Status	Email	Regis...	Man...	Avatar
ziyaeepour@pouyesh.n...	System User	Nooshin ziyaeepour	Inactive	ziyaeepour...	2021/07/31	Manage Role	
a@b.com	System User	Test User	Active	a@b.com	2021/07/01	Manage Role	
administrator	Admin User	System Administra...	Active	kabiri_198...	2019/12/27	Manage Role	

- Roles: An unlimited number of roles may be defined like: Admin, etc. Each user may have one or more roles.



- > Administrator
 - System User
 - Supervisor
 - Test
 - Test1

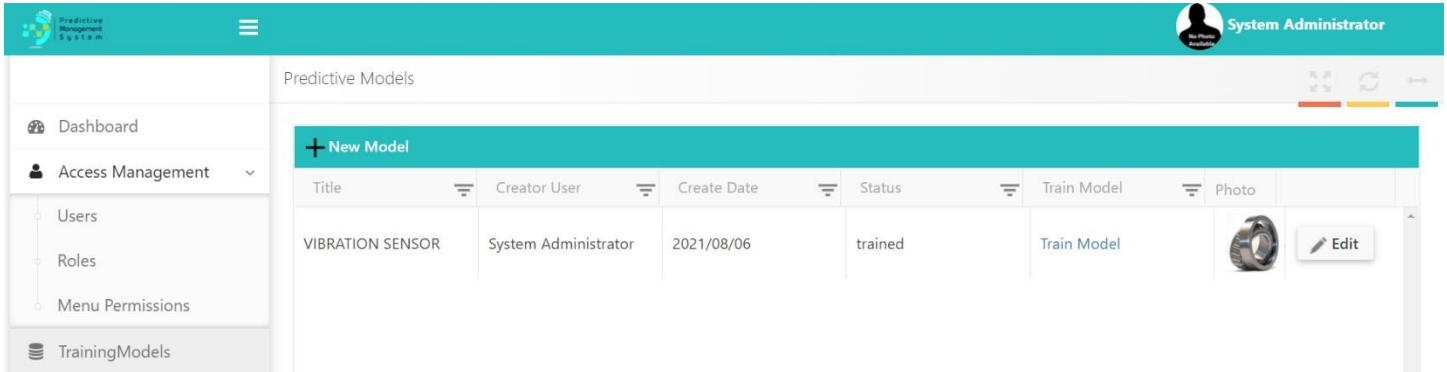
- Menu Permission: Where Admin can define which parts of the menu are accessible for each role.

Manage Menus

> Administrator	> <input checked="" type="checkbox"/> Main Menu
System User	<input checked="" type="checkbox"/> My Profile
Supervisor	<input checked="" type="checkbox"/> Logout
Test	
Test1	> <input type="checkbox"/> Access Management
	<input type="checkbox"/> Users
	<input type="checkbox"/> Roles
	<input type="checkbox"/> Menu Permissions
	<input type="checkbox"/> Static Pages
	<input type="checkbox"/> Pictures
	> <input type="checkbox"/> Setting
	<input type="checkbox"/> Site Setting
	<input type="checkbox"/> Contact Forms
	<input type="checkbox"/> Contact us
	> <input type="checkbox"/> Reports
	<input checked="" type="checkbox"/> Device Alarms
	<input type="checkbox"/> Periodic RUL
	<input type="checkbox"/> Daily RUL

As expressed before, in Role defining section, managing roles will be adjusted like Admin, Tester, User or even the client's name.

- **Training Models:**



- Once Admin clicks the Training Mode on Roll Bearing icon, a small page will be opened to show:
 1. Training Status
 2. The Training Accuracy
 3. Training Time(s): Normally between 1000 to 1200 seconds.
- You should add any new device under analysis, in this section by defining a Model. In this section you need to allocate Data Set to train the system. After defining the model, you need to define Model Fields.

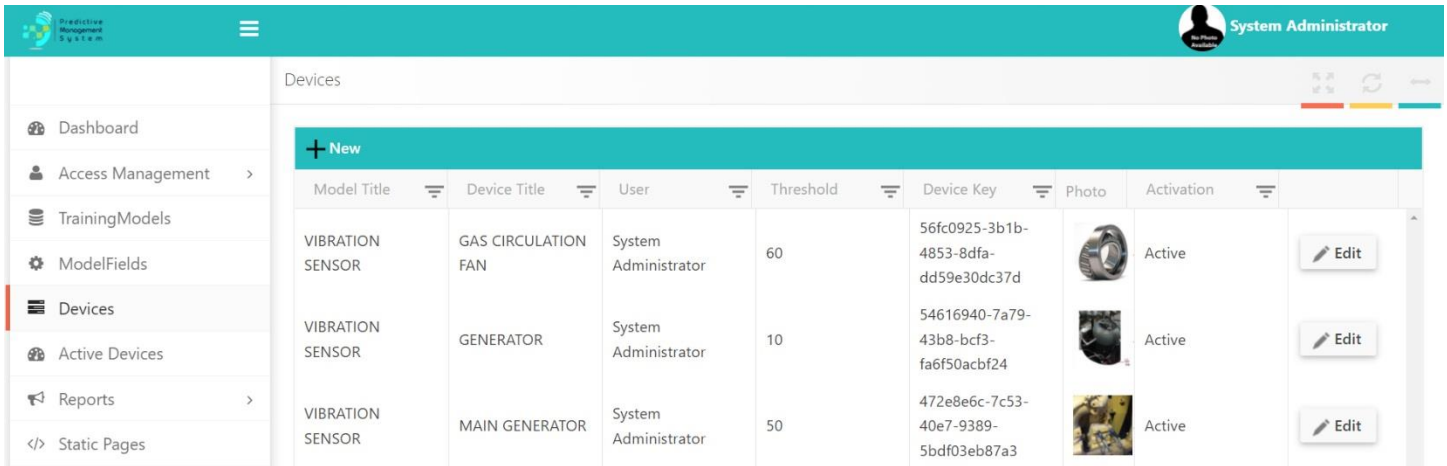
• Model Fields:




Model Title	Field Title	Column Index	
VIBRATION AND HEAT SENSOR	Time	2	Edit
VIBRATION AND HEAT SENSOR	RMS	1	Edit
HEAT SENSOR	Time	2	Edit
HEAT SENSOR	RMS	1	Edit
VIBRATION SENSOR	Time	2	Edit
VIBRATION SENSOR	RMS	1	Edit

Once you push the "New" button, you will see RMS and Time are the fields which are defined for Roll Bearing. In this device (Roll Bearing) we should define which column in the Excel of Data Set is RMS and which one is Time for example. In fact, if the data set are Excel input, we should define which one is the 1st or 2nd or... column. The Column Index box is used for this purpose. The last Column is output which you can click "Update" button instead.

So, push "Train Model" if you are Admin, then "Select the file", then "Start Training". Once the situation of the model changes to "Trained" from "In Progress";

• Devices:



Model Title	Device Title	User	Threshold	Device Key	Photo	Activation	
VIBRATION SENSOR	GAS CIRCULATION FAN	System Administrator	60	56fc0925-3b1b-4853-8dfa-dd59e30dc37d		Active	Edit
VIBRATION SENSOR	GENERATOR	System Administrator	10	54616940-7a79-43b8-bcf3-fa6f50acbf24		Active	Edit
VIBRATION SENSOR	MAIN GENERATOR	System Administrator	50	472e8e6c-7c53-40e7-9389-5bdf03eb87a3		Active	Edit

Once the Model is trained, you can define your devices. In this section you will be able to define the "Alarm Threshold" of warning announcement by the system, in addition to intervals too. In our model we chose 40 with an interval of 30 minutes for example. In the last box, you define the person who should be warned via their email definition. Each device will be defined for Our Server by a Device Key which is generated automatically.

• Active Device:

Devices

- GAS CIRCULATION FAN**
Description : VIBRATION SENDOR GAS CIRCULATION FAN
Uniqueld : 56fc0925-3b1b-4853-8dfa-dd59e30dc37d
Last RUL Value : 38.6181284428776
Last Log Time : 2021-08-24 15:51:31
[View Device Status](#)
- GENERATOR**
Description : VIBRATION READING ON MAIN SHAFT
Uniqueld : 54616940-7a79-43b8-bcf3-fa6f50acb24
Last RUL Value : 77.4054390752684
Last Log Time : 2021-09-24 09:02:33
[View Device Status](#)
- MAIN GENERATOR**
Description : VIBRATION AND HEAT MONITORING
Uniqueld : 472e8e6c-7c53-40e7-9389-5bdf03eb87a3
Last RUL Value : 22.4539357386222
Last Log Time : 2021-09-25 05:29:07
[View Device Status](#)

Shows the devices which are already under analysis. Under this section, we can check any "Device Status" with further information. Here a Roll Bearing Useful Life (RUL) is shown in the server side, while in the lower box, we will have a log of any advised alarm, if there is any. (Currently no Alarm is shown.)

If we press "View Device Status" a new page will show us the RUL by the system:

Device Status

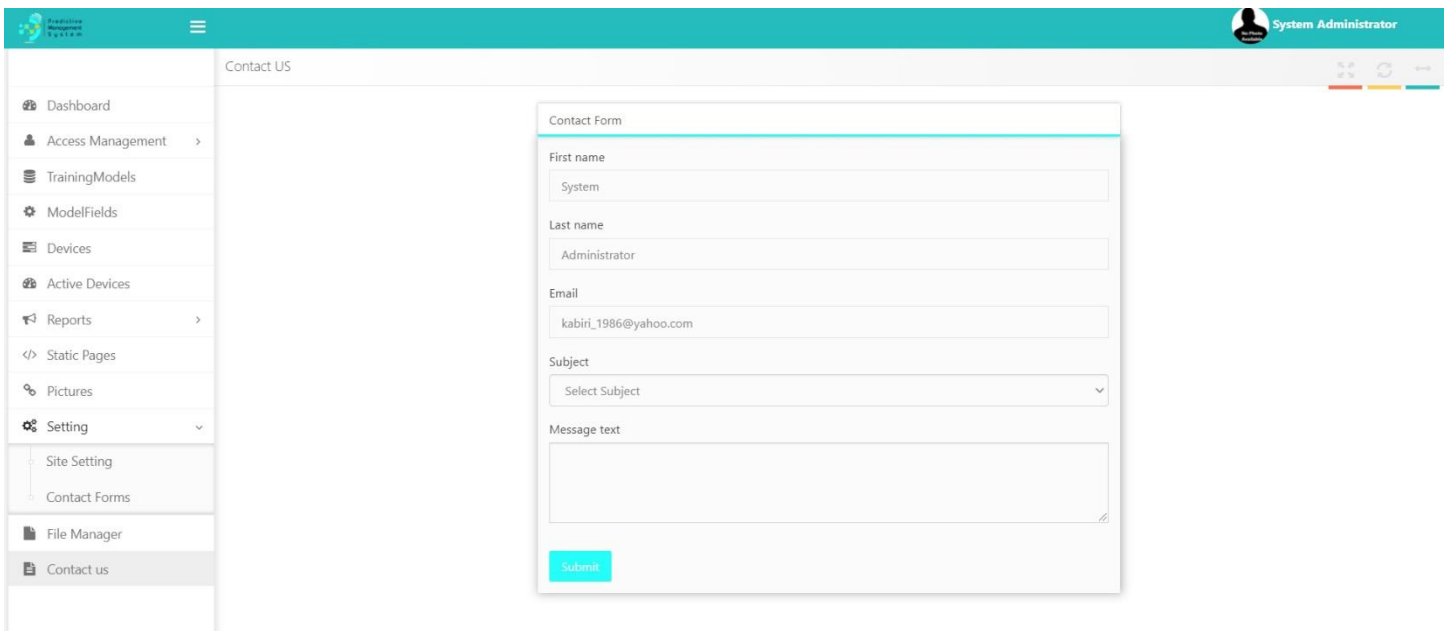
GAS CIRCULATION FAN

RMS Data

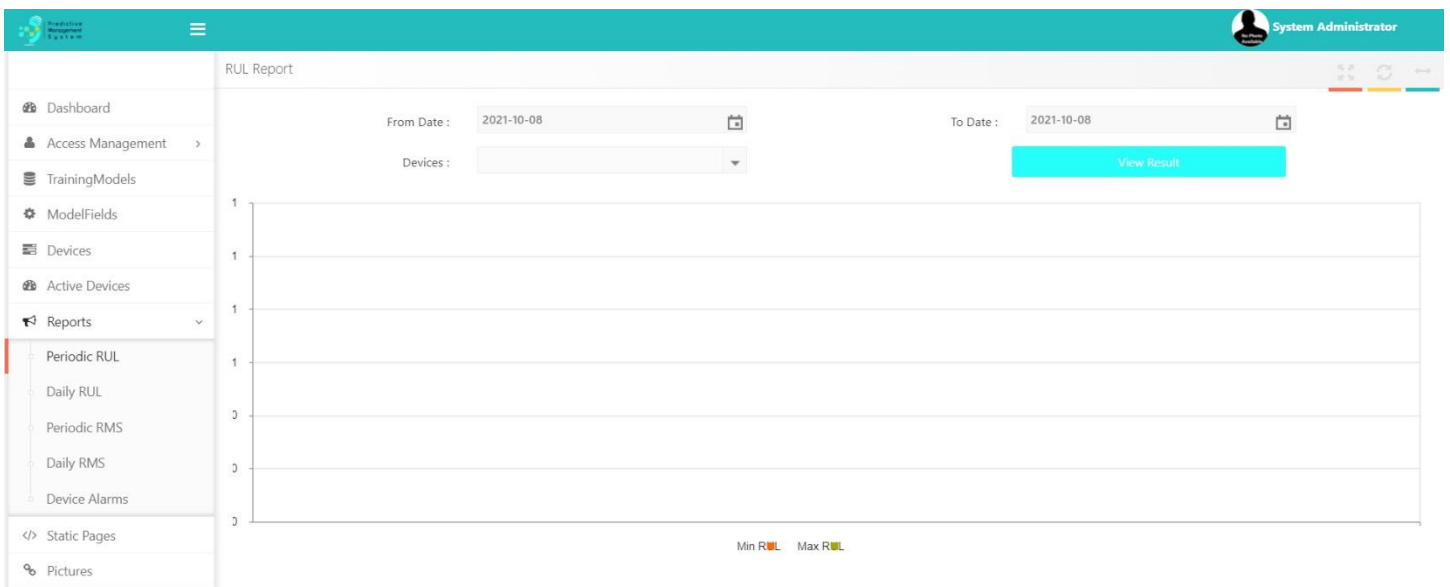
RUL Value

Device Description :
VIBRATION SENDOR GAS CIRCULATION FAN

In this version, we have added a form to transfer the end-user's experience to the admin as follows:



Also a report with daily or periodic interval is reachable from the following menu:



Daily RUL Report

Device : Date : 2021-10-08

[View Result](#)

1
1
1
1
0
0

RUL

Device Alarm Report

From Date : 2021-10-08 To Date : 2021-10-08

Devices :

[View Result](#)

Device Title	DateTime	Threshold	RUL	Emails
--------------	----------	-----------	-----	--------

Same as any other program, Exit is also placed there to leave the program.

The End.