

2021



# Quick Start Guide

DEVICE AND CLOUD USER GUIDE  
FOR PREDICT-PLUS VERSION 3.0

PREDICT-PLUS | [predict.plus@dxpe.com](mailto:predict.plus@dxpe.com)



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## Preface

### About This Guide

This Quick Start Guide explains the assembly and installation of the Predict-Plus hardware, as well as the setup procedure and device activation to utilize the Predict-Cloud. This guide provides instruction to deploy Predict-Plus into the field and begin viewing and collecting data from your equipment.

### Intended Audience

This guide is intended for DXP personnel and Predict-Plus end users.



## Device Overview

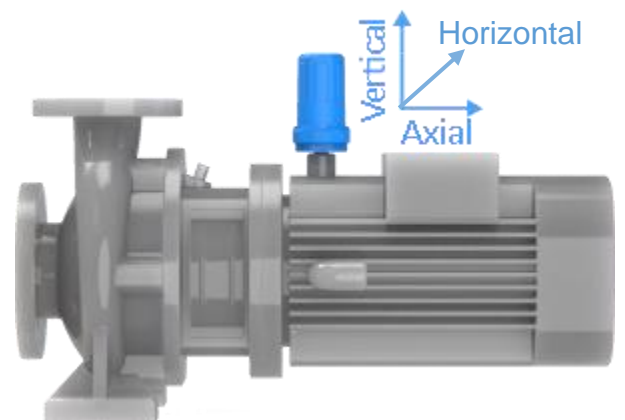
### Component Identification and Feature Nomenclature

- A. ¼" NPT Mounting Stud
- B. Wrench Flats
- C. Sealing O-Rings
- D. SIM Card Slot
- E. Cellular Antenna
- F. LED Indicator
- G. AA Battery (1 of 3)
- H. Nylon Device Cover
- I. Label with Device Identification & Certification Information
- J. Nylon Locking Ring



### Device Mounting Considerations

Predict-Plus shall be mounted as close to the thrust bearings of the equipment as possible to ensure optimal equipment data gathering. Predict-Plus shall be mounted to the equipment via the ¼" NPT Mounting Stud, a converter stud in the ¼" x 20 inset tap, and/or an accelerometer mounting accessory. Predict-Plus shall be mounted in order that the axes of the devices correspond with the axes of motion from the rotating equipment. The wrench flats (B) on the side of Predict-Plus shall be parallel to the equipment shaft. Predict-Plus shall be mounted on the top face of the equipment whenever possible.





## Power Requirements

Predict-Plus must be powered by 3 Energizer Ultimate Lithium® AA Batteries. Under standard operating conditions of 1-2 Predict-Cloud uploads per day and a sampling frequency of 5 minutes, the rated battery life of Predict-Plus 3.0 is 1 year. Do not use AA batteries other than Energizer Ultimate Lithium® due to potentially inadequate voltage and dramatically shortened battery life.

## Predict Cloud Overview

### Account Setup Procedure & Device Initiation

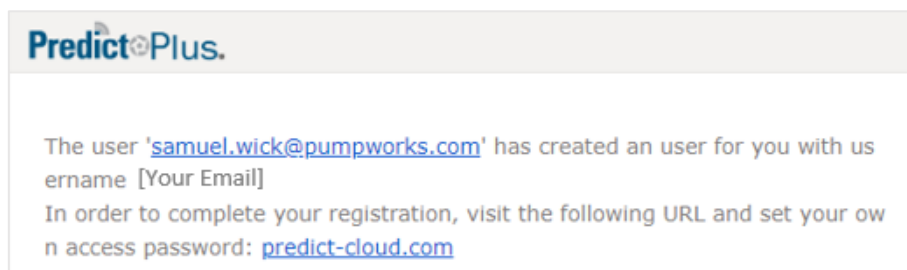
Please follow these steps in numerical order to activate your accounts and devices. Your device is already provisioned with the latest firmware, to view your data online you must register and activate the device.

1. Account Initiation

Email Sam Wick at [Samuel.Wick@dxpe.com](mailto:Samuel.Wick@dxpe.com) or call 713-996-6072 asking to initiate a Predict Plus user account activation. Please provide in this correspondence the intended user email address, first and last name, and the Device ID that is printed on the label of the Monitoring Unit.

2. User Account Setup

Within 48 hours of the Account Initiation email being sent to Sam, you will receive an email response from [account@amiglobal.com](mailto:account@amiglobal.com) with a subject of *Predict Cloud User Activation Email*. Follow the directions that this email prompts and you will be directed to set up your login information in the Predict Cloud.



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### 3. Device Initiation

Connect Battery Assembly or Power Cable using correct power requirements (details in Power Requirements).

The LED Indicator will flash sharply on and off indicating the device is powered on and attempting to connect to the server. When the LED Indicator begins to flash on and fade off (heartbeat), it has successfully connected to the server and you can view your device in the Predict Cloud. Please note, all Predict Plus devices ship activated and ready to connect.

**Reset Password**

Fill out form to complete User activation process. All fields are required:

[Your Email]

Password

Repeat password

[Your Email]

Please select security question

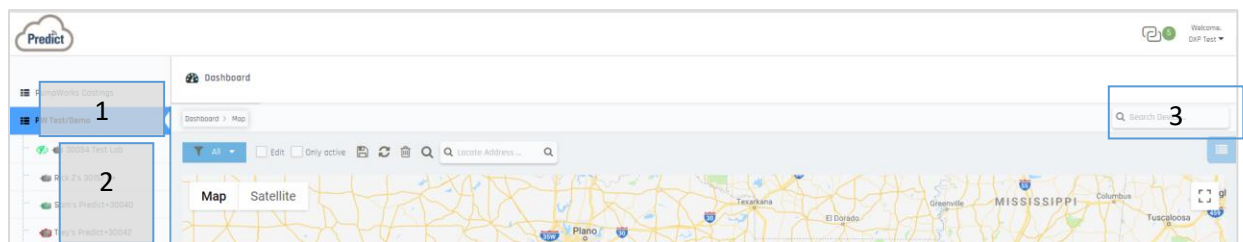
Security Answer

**Send →**

## Predict Cloud Navigation

The Predict Cloud can be accessed via a web browser or the mobile app. When accessing via a web browser, use Google Chrome, Mozilla Firefox, Microsoft Edge, or Apple Safari. The Predict-Cloud website does not support Internet Explorer. The mobile app can be downloaded in the Apple App Store or the Google Play Store. Search *Predict Cloud*, download, and sign in with your user credentials.

The Predict-Cloud main dashboard shows a map view of your devices and a list of the accounts you can access. By clicking on an account, you can view a list of the devices under that account. From this dashboard screen you can select which account to view (1), select which device to view (2), and search by device ID number (3).



By clicking on an individual Predict-Plus unit, you can view equipment data and interact with the features of that specific device. Each device has 3 tabs used for navigating the various features; Main, Reports, and Setup.



- Under the **Main** tab, the General Data, Alerts and Runtime, Advanced FFT, Installation Properties, and Configuration pages can be found.
- Under the **Reports** tab, the Email History, SMS History, and Scheduled Reports pages can be found.

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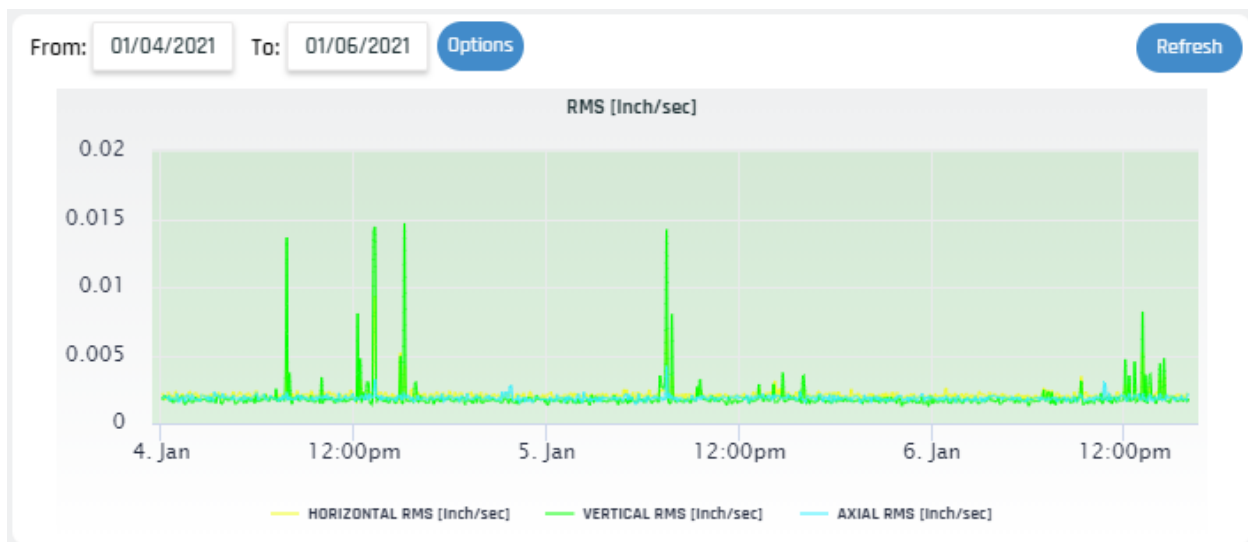
- Under the **Setup** tab, the General, Ver & Comm, Firmware & Template, and Service pages can be found.

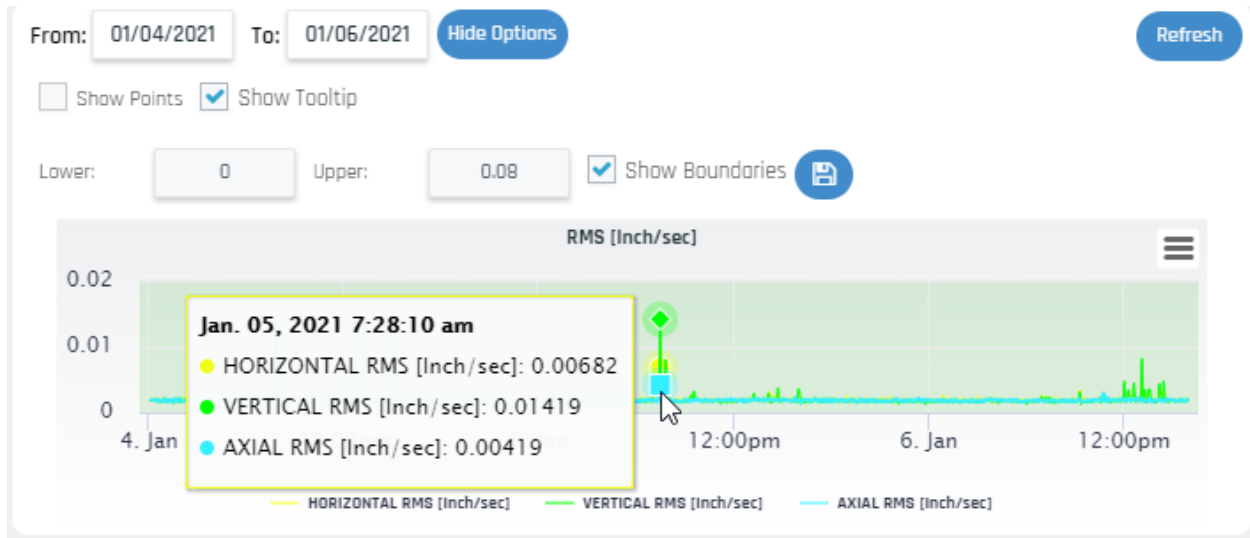
## Main

### General Data

The General Data page features the Overall RMS Vibration, Temperature, and RPM trend graphs. All trend graphs within the Predict-Cloud can be interacted with in the ways detailed below:

By default, the device will display data from the past week of operation, but this date range can be expanded using the **From:** and **To:** date boxes. Data can also be inspected closer by clicking and dragging to highlight a specific data range. When a datapoint is hovered over with the cursor, the exact values of that sample will be shown in a small window along with the exact timestamp. By clicking the **Options** button, additional graph interaction tools can be accessed. By inputting Y Axis values into the **Lower** and **Upper** boxes, a boundary condition can be created for easy visual indication of good operation conditions. To have this boundary displayed in the trend graph, check the **Show Boundaries** box and click the **Save** button (Note: the RMS trend graph is the only trend graph with a boundary condition feature). By clicking the 3 vertical lined icon in the upper right of the trend box, a drop-down menu will be displayed with options to view the graph in full screen, print the current graph selection, and export the current selection in a variety of formats.





## Alerts and Runtime

The Alerts and Runtime page features an **Alerts Setup** table for Temperature and all 3 axes of RMS vibration as well as a Runtime bar graph and an RPM trend graph.

The Temperature alert can be set by clicking the **Temperature** field of the table which will open a setup window. Within that window the specific temperature to trigger an alert can be set. Each alarm can be set to notify specific users on the account with two levels of escalation for each user. From the Alert Setup menu, users can be selected to receive minimum and maximum threshold notifications. From the Select Users menu, two levels of escalation can be set per user so long as SMS notifications are enabled. When the initial user receives a text notification, they will be given the option to acknowledge or escalate. Please note that in order for text alerts to function properly, the mobile number of the user must be preceded by a +1 country code.

Properties	Edit
Min.threshold	0 <input type="button" value="Select Users"/>
Min.threshold alert text	Low Temp Alert
Max.threshold	300 <input type="button" value="Select Users"/>
Max.threshold alert text	High Temp Alert
Show percentage threshold	<input type="checkbox"/>
Account	Lexington Plant

User	@ 1	@ 2	SMS	Escalation 1	Escalation 2
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None	None
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

The RMS Baseline alert requires a different setup. Rather than using a fixed threshold, the RMS alerts are triggered based on a percentage change from baseline. The baseline can be manually set from the **Alerts**







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**Setup** table, or the baseline can be automatically created using the **Baseline Auto Learning** feature on the **Installation Properties** page. This feature setup will be addressed later under the **Installation Properties** section.

If manually setting the baseline for an RMS alert, input the vibration baseline value in the **Value** field and click the **Save** icon. To set the alert itself, click the **Parameter** field for the axis you are setting to open the **Grid Alerts** window. Enter the percentage change value to trigger the alert (e.g. to set the alert to trigger if the vibration exceeds a 25% change from baseline, input 25 into the **Max Threshold** field). Select the users and escalations to receive this alert via the **Select Users** button. When finished, click **OK** to close the window and save the threshold settings.

**Note:** the **TOTAL RMS** alert is the sum of the 3 axis baselines, not an average of all 3.

Parameter	Value	Unit	Save
VERTICAL RMS baseline	0.000	Inch/sec	
HORIZONTAL RMS baseline	0.000	Inch/sec	
AXIAL RMS baseline	0.000	Inch/sec	
TOTAL RMS baseline	1.000	Inch/sec	

**Grid Alerts** ✖

Properties	Edit
Min Threshold	0.000 <span>Select Users</span>
Min Alert text	<input type="text"/>
Max Threshold	25.000 <span>Select Users</span>
Max Alert text	<input type="text"/>
Account	<input type="text"/>

Ok Cancel



## Advanced FFT

The Advanced FFT page serves to display harmonic orders of the equipment's operating frequency. Because these harmonic orders are tracked over time, a user can examine how vibration in different frequencies is changing, aiding in diagnosing faults as they begin to persist. Each axis is displayed individually for more accurate diagnosis. By default, the harmonic orders plotted are 1X, 2X, 3X, 4X, and 5X the operating frequency of the equipment.



## Installation Properties

The Installation Properties page features a table for users to input notes on the equipment the Predict-Plus device is stored on for reference and context when examining the device. This page also contains the **Baseline Auto Learning** trigger setup and a **Pump Orientation** adjustment feature.

The equipment notes table can be edited by clicking the **Edit User Text** icon  in the top banner and clicking the **Edit** button below the table. Within the **Grid Edit** window, the free text spaces can be edited as the user desires. In order to save the free text, click save in the Grid Edit window and then click the **Save User Text** icon  in the top banner.

The **Baseline Auto Learning** trigger can be set via the drop-down field. This feature will trigger the Predict-Plus device to log and average the vibration levels in each axis for a specified time range after the next upload window. Using the drop-down field, select the range of time for the baseline to average and click the **Save** icon.

The **Pump Orientation** adjustment feature can be set by selecting horizontal or vertical orientation from the drop-down field and clicking save. Upon the next upload time, the device will adjust axes and orientation diagrams within the Predict-Cloud accordingly.

## Configuration

From the Configuration page, upload times, sample rate, and power mode can be set. These settings are set to a default and should not be adjusted without consulting DXP. When these defaults are changed, the battery life is subject to change and can no longer be certified with a 1 year life.

Also found on the Configuration page is the Battery Life graph and the setup for background filtering. Predict-Plus has a filtering feature that allows the device to disregard vibration coming from other equipment or feedback through the system. This is especially useful in situation where multiple assets are mounted in close proximity or feeding into a common process. By setting these filters correctly, we get the most accurate data reported to the cloud.

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The **Calc Mode** determines what in method the FFT will be calculated and displayed.

In **DXP T-AXIAL**, the RPM is used to determine 1X, 2X, 3X, 4X, and 5X reading displayed over time.

In **Raw FFT** upload, a more traditional FFT chart is displayed. Users should not use this mode because it will drastically drain the battery.

Data recorded in one calc mode cannot be displayed in the other calc mode. This can generate data gaps if calc mode is changed when running.

Parameter	Value	Unit
Calc mode	Normal	
Max. Motor speed	3600	RPM
Min Motor speed	2800	RPM
RPM detection filter	None	
Runtime X RMS Threshold	000900	Inch/sec
Runtime Y RMS Threshold	000900	Inch/sec
Runtime Z RMS Threshold	000900	Inch/sec

Save

Saves configuration changes. Changes will be uploaded to the device during the next communication window. You can also power cycle the device to force a communication window.

These filtering setting help the device to filter out vibration not coming from the rotating equipment itself and improve the accuracy of the RPM, RMS, and FFT, and Run Hour reporting).

Enter the maximum motor speed in RPM (e.g. 3600 RPM).

**IF THE MOTOR IS CONTROLLED BY A VFD**, input the lowest RPM at which the VFD will run the motor.

**IF THE MOTOR IS NOT CONTROLLED BY A VFD**, enter a Min Motor speed of 0 RPM.

Choose a filter strength based on how much background vibration you expect. The more equipment mounted in close proximity or vibration generated by the surroundings, the higher the filter should be set.

## Reports

### Email History and SMS History Pages

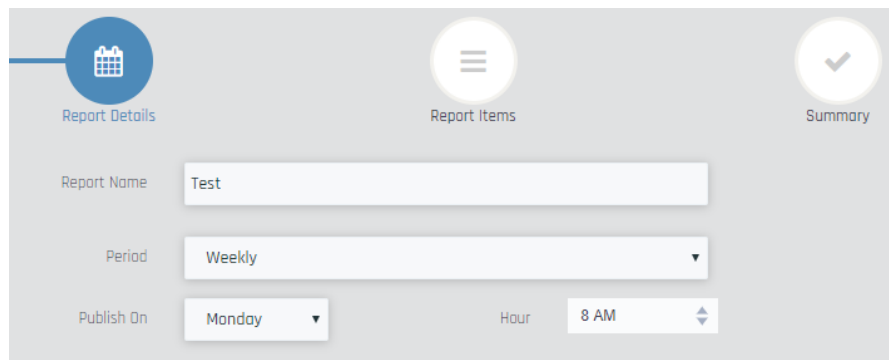
The Email History and SMS History serve to keep a log of any email or SMS messages sent by the device. These sections are only used for troubleshooting and service and do not serve in monitoring function.

## Scheduled Reports Setup

To create a recurring report, go to Reports > Schedule Reports and click the “Add Report” button.

### Report Details

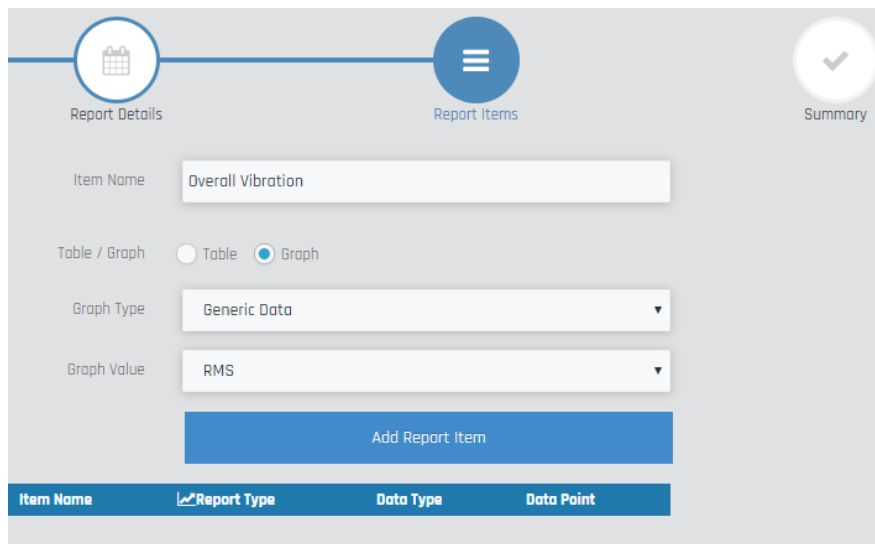
Enter a name for your report, select if you want the report generated monthly, weekly, or daily, select the date, day of the week, and/or time for the report to generate, and click “Next”.



The screenshot shows the 'Report Details' step of the setup process. At the top, there are three navigation icons: a calendar for 'Report Details', a menu for 'Report Items', and a checkmark for 'Summary'. The 'Report Details' icon is highlighted with a blue line. Below the navigation, there are three input fields: 'Report Name' with the value 'Test', 'Period' with a dropdown menu set to 'Weekly', and 'Publish On' with a dropdown menu set to 'Monday'. To the right of 'Publish On' is an 'Hour' field with a dropdown menu set to '8 AM'.

### Report Items

Name the item(s) for the report, set the *Graph Type* to *Generic Data* and choose which trend graph you want for this report item from *Graph Value*, and click [Add Report Item](#). When you have chosen your value(s), click [Next](#).



The screenshot shows the 'Report Items' step of the setup process. At the top, there are three navigation icons: a calendar for 'Report Details', a menu for 'Report Items', and a checkmark for 'Summary'. The 'Report Items' icon is highlighted with a blue line. Below the navigation, there are four input fields: 'Item Name' with the value 'Overall Vibration', 'Table / Graph' with radio buttons for 'Table' and 'Graph' (the 'Graph' button is selected), 'Graph Type' with a dropdown menu set to 'Generic Data', and 'Graph Value' with a dropdown menu set to 'RMS'. Below these fields is a blue button labeled 'Add Report Item'. At the bottom, there is a table header with four columns: 'Item Name', 'Report Type', 'Data Type', and 'Data Point'.

### Summary

If the details in the summary are correct, click finish and your report will automatically generate at the next scheduled time.


## Setup

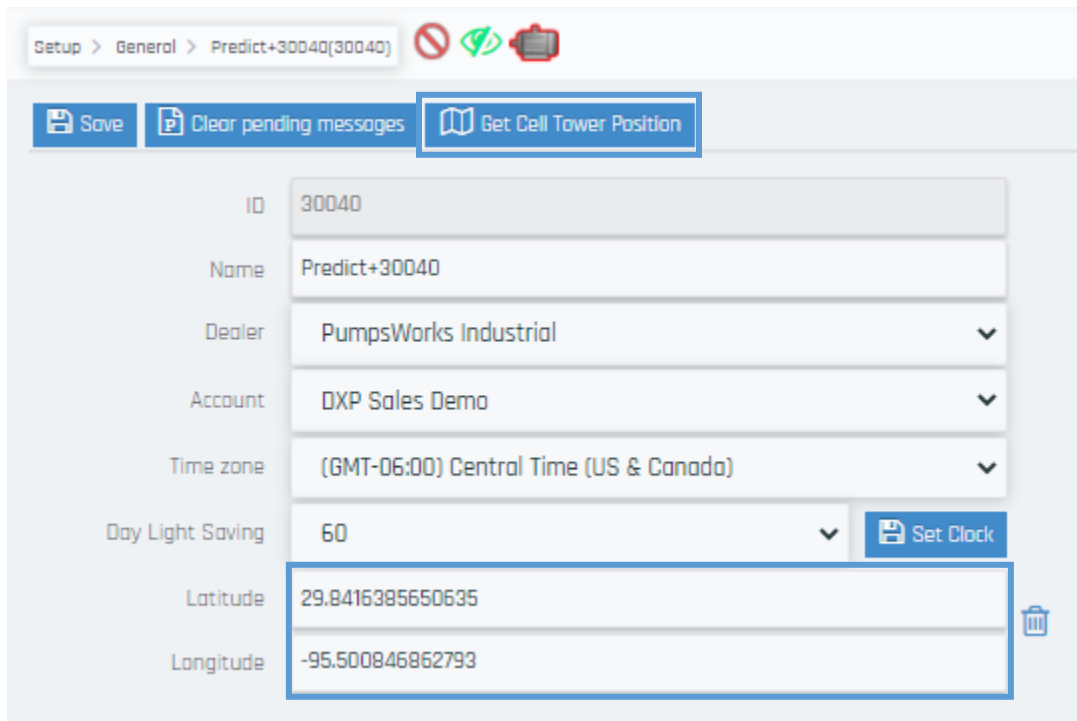
### General




The General page of the Setup tab contains general information such as the device serial number, the device name, and the dealership and account the device is partitioned under. This page also contains the time zone setting and the device location fields. To edit the device name, enter the custom name you desire in the **Name** field and click the **Save** button at the top of the page.




In order view the location of your device(s) on the Predict-Cloud map, you must set the device location. There are two ways to set the location initially and then the location can be moved after the fact through the map editing options.







#### Setting the Device Location

In order to set the device location, you can either trigger triangulation based off the cell towers or input the latitude and longitude of the device or equipment site. Latitude and longitude is preferred to triangulation because due to factors such as cell tower density, nearest tower ping, and accuracy of triangulation service map data, the triangulated location may not fall on the actual device location. By using the manual coordinates you ensure best accuracy. To set the location, either press the “Get Cell Tower Position” button, or enter the latitude and longitude and press the “Save” button. To clear the saved location, simply press the  button and then “Save”.




Setup > General > Predict+30040(30040)   

 Save  Clear pending messages  Get Cell Tower Position

ID	30040
Name	Predict+30040
Dealer	PumpsWorks Industrial 
Account	DXP Sales Demo 
Time zone	(GMT-06:00) Central Time (US & Canada) 
Day Light Saving	60   Set Clock
Latitude	29.8416385650635 
Longitude	-95.500846862793

## Modifying the Device Location on the Map

Once the location has been saved to the map, fine adjustments can be made by dragging the icon to a specific location. To edit the location, select the “Edit” checkbox above the map and click and drag the icon with your cursor. Once the icon is in the desired location, click the  button and uncheck the “Edit” box.

## Ver & Comm

The Ver & Comm page contains information on the software and hardware versions of the device. This page is used only in troubleshooting and cannot be edited.


## Firmware & Template

The Firmware & Template page is use for updating the firmware and template. This page is generally only handled by troubleshooting. For assistance with firmware and template updates, you can contact [Predict.Plus@DXP.com](mailto:Predict.Plus@DXP.com)

Before updating any firmware, set the device power in the Configuration page to ON for 20 minutes. This will trigger the device to stay awake for a 20 minute window on its next connection (likely its next scheduled upload time). When the device is awake, click the **Download** button to begin the firmware download. The progress of the download will be tracked in the **Firmware Transfer Status** table.

To update the template, select the newest version from the **Template Setup** drop-down and click **Apply**.

Firmware version

**Available firmware** AMI\_GEN3\_Spectral\_v39.92\_r9.23-apk.bin (39.92) 

**Current firmware** 39.91


Firmware transfer status

DeviceID	File Name	Time	Progress	Status
300101				No firmware transfer in progress

Versions

**Firmware** : BLUEGRASS-VIBE-MODBUS  
**Modem** : Quectel-EG25  
**Board** : GEN3  
**Service Plan** : Standard

template setup

DXP\_GEN3\_v10.27.20 



## Service

The Service page contains a log of device notes. Firmware and template notes are automatically added to the log, but free text notes can be added via the **Add** button in the upper left of the page. These notes are free text and can be added to log information on periodic maintenance or other such items and events.

## Contact

If further information or assistance is needed, please contact us at [Predict.Plus@dxpe.com](mailto:Predict.Plus@dxpe.com) or call 713-993-6072.