2020

Predict Plus™

Quick Start Guide

DEVICE AND CLOUD USER GUIDE
FOR GEN2 PREDICT-PLUS

PREDICT-PLUS | predict.plus@dxpe.com

Table of Contents

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.
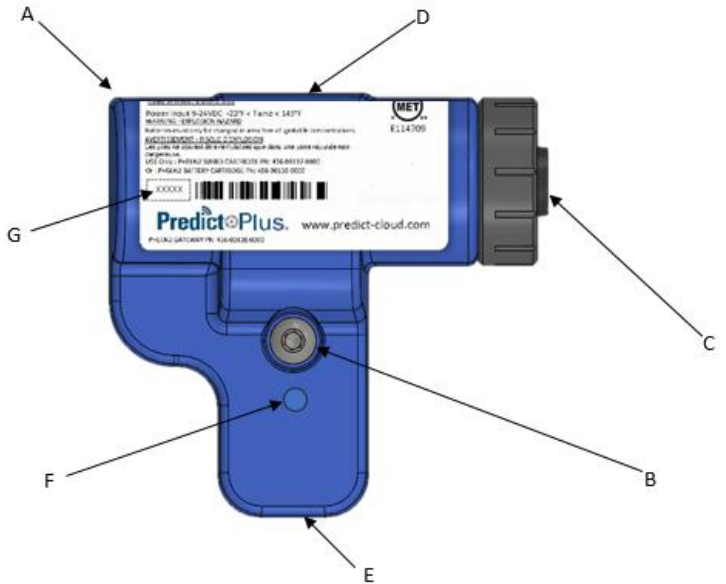
Intended Audience

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

Device Overview

Component Identification and Feature Nomenclature

A. Gateway
B. Gateway ¼-20 Button Head Cap Screw
C. Battery Assembly or Power Cable
D. Front of Gateway
E. Back of Gateway
F. LED Indicator
G. Device ID

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 a ½-20 button head cap screw or suitable replacement, or with a high strength magnet. For flat surfaces, a flat magnet is suitable, but for convex or curved surfaces, a two pole magnet is recommended. Predict-Plus shall be mounted in order that the axes of the devices correspond with the axes of motion from the rotating equipment. Predict-Plus shall be mounted on the top face of the equipment whenever possible.
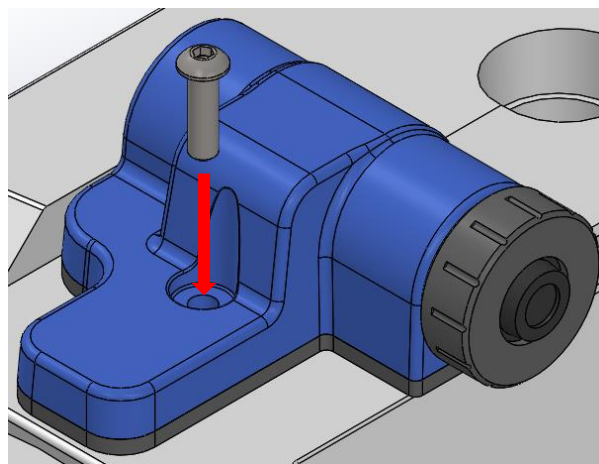
Assembly

1. Place Gateway on top of pump frame with Device ID facing upwards (See Assembly Diagram 1).
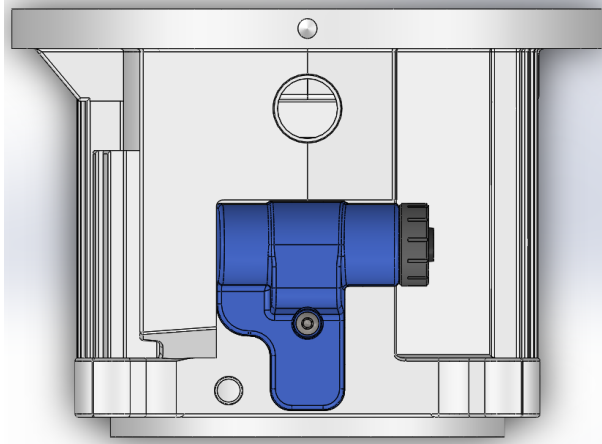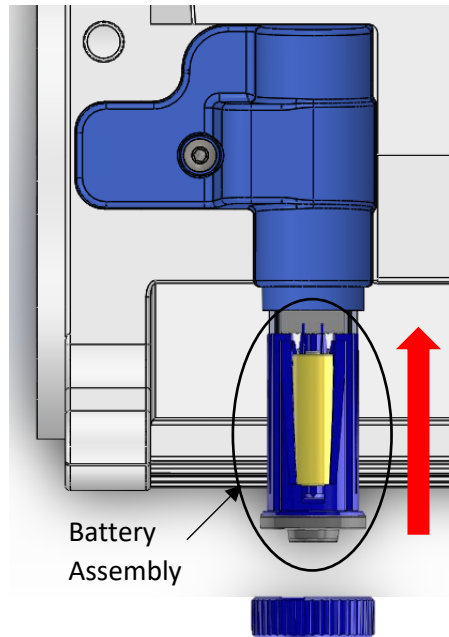

Assembly Diagram 1

2. Fasten Gateway using one Gateway ¼-20 Socket Head Cap Screw (See Assembly Diagram 2).
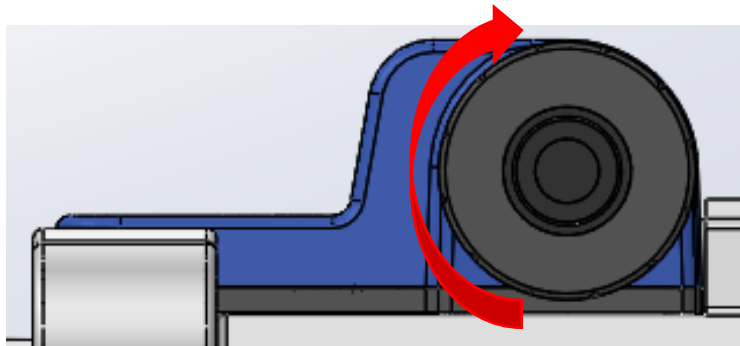

Assembly Diagram 2

3. Ensure the Battery Assembly is installed in the correct orientation (See Assembly Diagram 3).
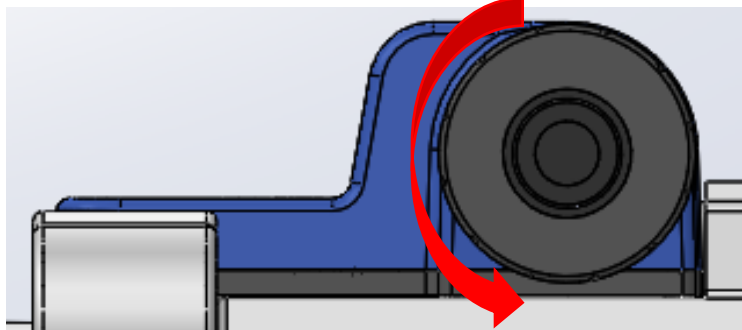

Battery
Assembly

Assembly Diagram 3

4. Hand tighten the Battery Cap (See Assembly Diagram 4).
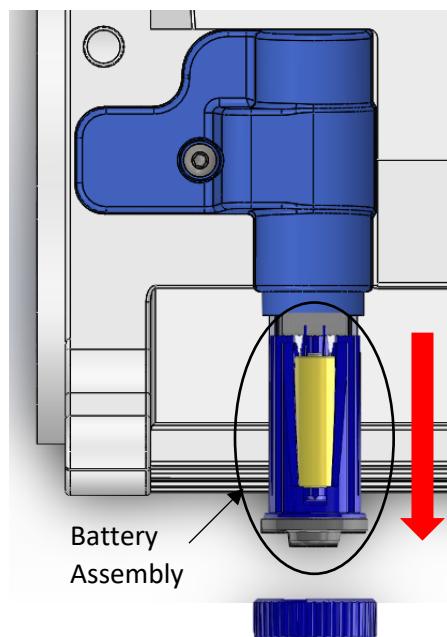

Assembly Diagram 4

Disassembly

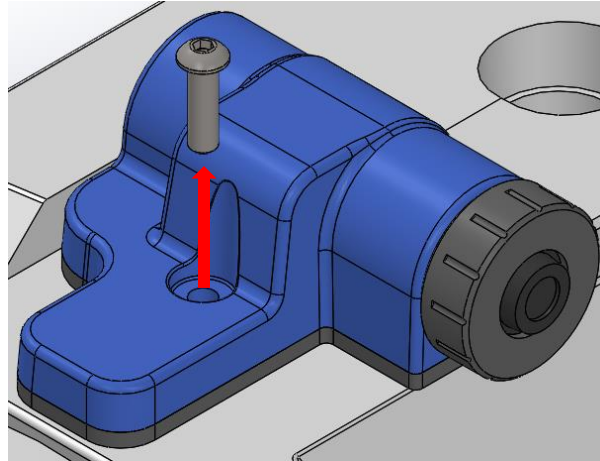1. Hand untighten the Battery Cap (See Disassembly Diagram 1).

Disassembly Diagram 1

2. Remove the Battery Assembly from the Gateway Body (See Disassembly Diagram 2).

Battery
Assembly

Disassembly Diagram 2

3. Unfasten Gateway ¼-20 Socket Head Cap Screw (See Disassembly Diagram 3).

Disassembly Diagram 3

4. Remove Gateway from top of pump frame (See Disassembly Diagram 4).
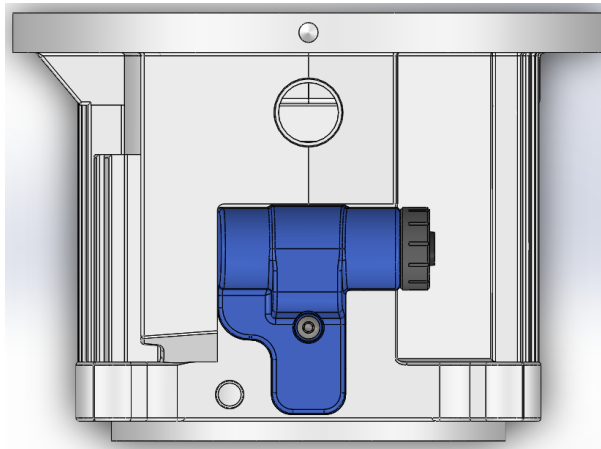
Disassembly Diagram 4

Power Requirements

If using the Power Cable, connect cable to a 24VDC power supply with a minimum of 30 mA of current.

If using the Battery Assembly, ensure there are 3 AA batteries in the assembly. Predict-Plus devices will ship out with 3 AA batteries already installed in the Battery Assembly.

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 active the device.

1. Account Initiation

   Email Sam Wick at 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 with a subject of *Predict Cloud User Activation Email*. Follow the directions that this email prompts (Figure 1) and you will be directed to set up your login information in the Predict Cloud (Figure 2).
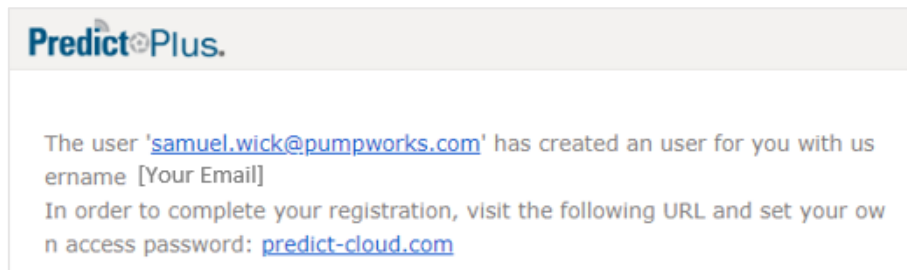

Predict Plus.

The user 'samuel.wick@pumpworks.com' has created an user for you with username [Your Email]
In order to complete your registration, visit the following URL and set your own access password: predict-cloud.com

Figure 1

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.
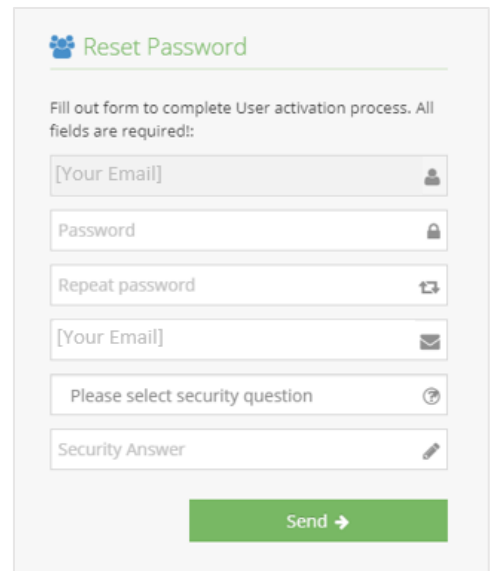

Reset Password

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 →

Figure 2

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 (Figure 4) 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).
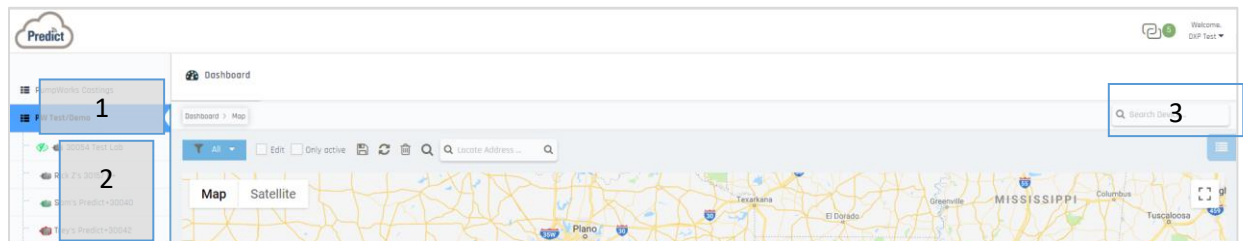

Figure 4

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.

1. Main

    The main device screen provides information on the specific piece of equipment the selected Predict-Plus device is monitoring. This screen also displays the General Information Trend, the RMS Vibration Trend, and the Alert Setup Gauges.

    Equipment Information

    The Equipment Information includes four editable free-text fields for an end user to enter equipment information providing context to aid users in studying the equipment data. Equipment Type denotes if it is a pump, motor, or some other form of rotating equipment. Name/Number denotes the serial OEM model name of number of the equipment. Plant Location can be used to describe the general area of a plant the equipment is located in or adjacent equipment it operates alongside (i.e. Chilled Water Pump, South Blower Motor). The Manufacturer field is used to list the original equipment manufacturer of the rotating equipment. By clicking the "edit" icon , the fields become editable and can be saved by clicking the "save" icon shaped like a floppy disk.

Trend Graphs

The trend graphs on the main screen as well as the isolated trend screens are used to show how the various equipment parameters change over time. This can be used to identify growing temperature or vibration which could be indicative of an issue.

All of the trend graphs (Figure 3) have an adjustable date range (1), selectable parameter trends (2) automatically adjusting scales (3), a refresh button (4), a full screen button (5), and a chart context menu (6). Whenever a date range is set, all other trend graphs will default to that date range for the duration of your login session. Once you leave the Predict-Cloud the date range will reset to the previous 7 days. You can also drill down to a shorter time range by clicking and dragging with your cursor within the graph. By clicking on a parameter at the bottom of the graph, you can hide or show that trend, allowing you to view only the parameters you are interested in at that time. By clicking the chart context menu, you are able to choose what form in which to export data from the trend graph and date range you are viewing. The options are to print the chart, download the chart as a PNG image, download the chart as a PDF document, or export the data points as a CSV file.
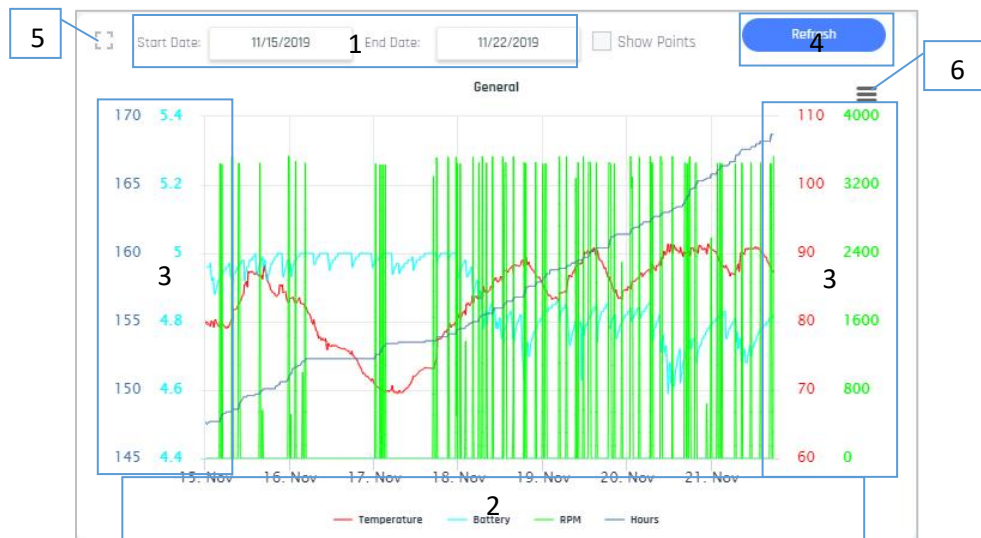

Figure 3

Individual trends for Radial FFT and Horizontal FFT can be found under Main > Control (Figure 4). These trend graphs will adhere to the same date range and controls as the trend graphs on the main device page. The Device Configuration can also be accessed from this dropdown tab. The Configuration is explained in the following pages.
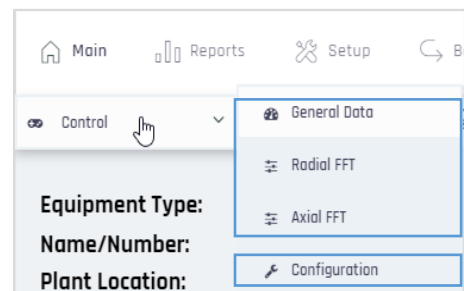

Figure 4

The RMS trend graph on the main device screen has a visual boundary that can be set. This allows you to create a green "go zone" for acceptable vibration levels. Viewing this trend with the boundary condition allows for quick visual inspection of overall vibration levels. To set the boundary condition, simply enter the values for the low and high limits in IPS, select **Show Boundaries** and click the "save" icon .

Figure 5

Alerts

The Alert Setup Gauges are located to the right of the trends on the device main screen. Interacting with these gauges is how the parameter threshold alerts are set up. The alert setup procedure is outlined in the Alert Setup section on page 13.

2. Reports
   The Reports tab allows you to view a log of email and text alerts sent by the device as well as set up periodic summary reports to be generated and stored in the Predict-Cloud. These reports can also be sent to selected users. The Report Creation procedure is outlined in the Report Creation section on page 15.

3. Setup
   The Setup tab allows you to access the General Setup, Versions & Communications (Ver&Comm), and check the firmware and template versions of your device. This allows you to see the current versions of hardware, software, and communication details of the device. In the general setup menu, users with Account Admin status or higher may edit the device name as it appears in the device tree and set the map location of the device using latitude and longitude. Setting the device map location is explained on page _____.

Device Configuration

The device will come preconfigured with the settings show in Figure 6. The minimum Sample Time allowed is 3 minutes. For low-power (battery powered) devices, we recommend a minimum SAMPLE TIME of 5 minutes and a minimum SAMPLES TILL LOG of 3 with two scheduled upload time per day. These are the recommended settings from which the one year battery life is determined. This means the device will sample data every 5 minutes and under normal operation will plot one data point every 15 minutes on the trend graphs. This keeps the trend graphs from becoming cluttered while still providing ample opportunity to detect a fault condition.

Please note that while we recommend 2 scheduled uploads per day, Predict Plus will automatically connect to the Predict Cloud and upload if a threshold alert is triggered. The following section will explain how to set the threshold alerts.

Figure 6-1

Filter Configuration

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. The filter parameter setup is found on the configuration page as well.

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

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

In FFT Points, a more traditional FFT chart is displayed.

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.

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.

Restores the device configuration setting to default, including filtering settings.

Parameter	Value	Unit
Calc mode	Tri-Axial	
Nominal Motor RPM	0	RPM
Run Mode	Line Frequency ▼	
Min speed with VFD	No VFD ▼	0-100%
RPM Filter	Not Used ▼	

Save

Default Config

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 nominal motor speed in RPM (e.g. 3600 RPM).

Select if the motor is operating off of line frequency or if it is being controlled by a VFD.

IF THE MOTOR IS CONTROLED BY A VFD, select the approximate percentage of nominal motor speed the motor will operate at a minimum during the process (e.g. 80% is the minimum speed is 3000 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.

Figure 6-2

Alert Configuration

In order to monitor the health of your equipment, the Predict-Cloud allows for threshold alerts to be set for vibration, temperature, and run hours. A battery voltage alert is also available for Predict-Plus devices using battery power. If the device is on wired power, the alert is automatically disabled. Each alarm can be set to notify specific users on the account with two levels of escalation for each user.

Alert Setup

To set up an alert, simply select the parameter gauge (Figure 7) to open the Alert Setup menu (Figure 8). Please note that the Runtime Alert is displayed as a table, but interacts the same as the gauge alerts.

Figure 7

Figure 8

From the Alert Setup menu, users can be selected to receive minimum and maximum threshold notifications. From the Select Users menu (Figure 9), 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.

Figure 9

Alert Escalation

If the initial recipient does not acknowledge or escalate the alert within 30 minutes, it will automatically send to Escalation 1 (as long as a user is selected). If Escalation 1 does not acknowledge or escalate within 30 minutes, it will automatically send to Escalation 2 (as long as a user is selected). Escalation 2 will only have the option to acknowledge the alert.

Report Creation

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".

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*.

Summary

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

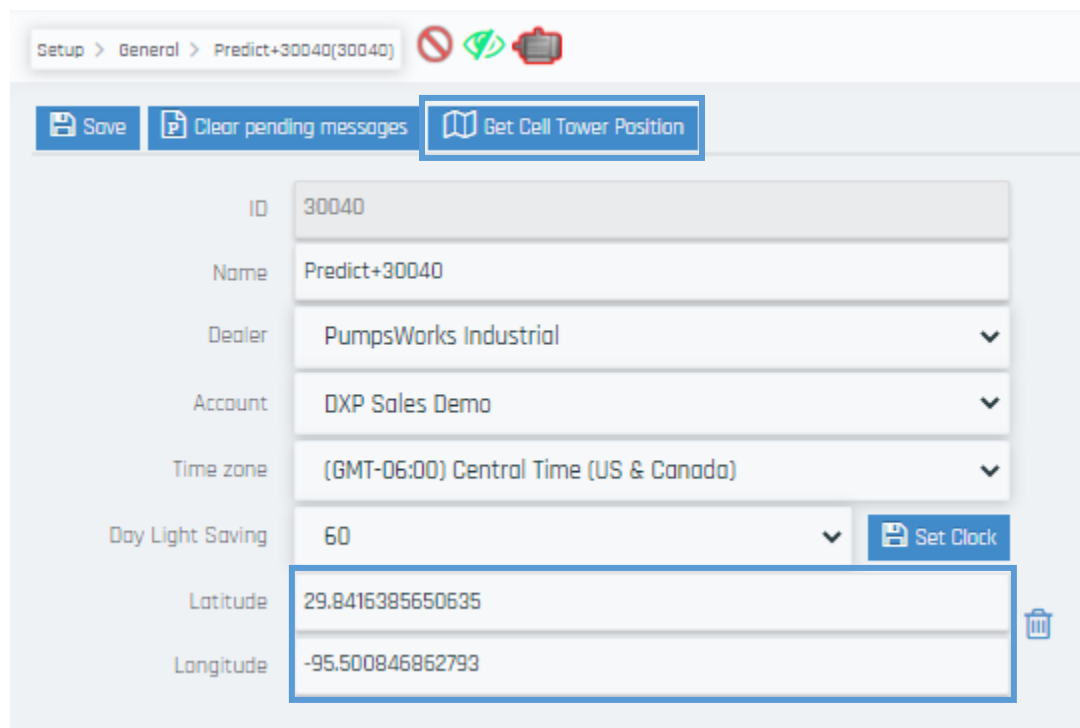# Device Location Setup

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".
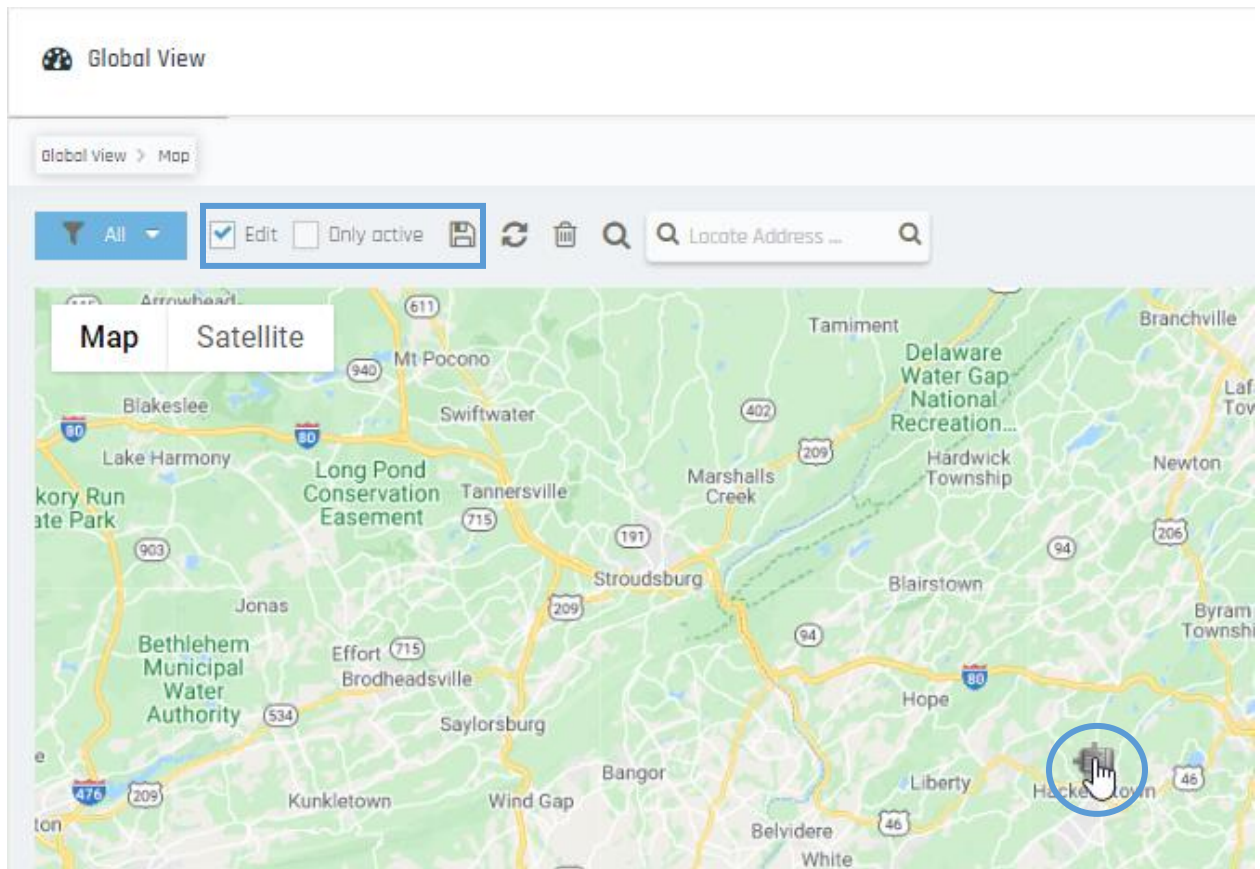
Modifying the Device Location on the Map

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.

Contact

If further information or assistance is needed, please contact us at Predict.Plus@dxpe.com or call 713-993-6072.