
CHESTERTON CONNECT™ MOBILE APP GUIDE

Condition Monitoring Sensor – Pressure, Temperature, and Vibration
APP VERSION 2.0



Chesterton
Connect™

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About the Chesterton Connect™ sensor

Chesterton Connect is a 24/7 conditioning monitoring system that enables users to monitor process and equipment operating conditions. Chesterton Connect makes it simple and easy to monitor:

- *Process temperature*
- *Process pressure*
- *3-axis vibration*
- *Surface temperature*

Chesterton Connect is aimed at equipment performance optimization, helping prioritize which equipment needs attention. The mobile app and unit's LED indicator alert the user of any vibration, temperature or pressure variations from the user programmed parameters. These alerts can help establish more efficient maintenance plans to help reduce unplanned downtime and asset failure.

About the Chesterton Connect app

Chesterton Connect communicates via Bluetooth® with its companion mobile app to display alerts and measured data. The Chesterton Connect app is a user-friendly mobile application that allows the user to visualize the data collected from the sensor. In addition, the app allows the user to connect to multiple sensors providing a comprehensive view of a plant's equipment health. The app lets the user set equipment parameters limits. The data can be exported for analysis helping the user understand the equipment's operation and take preventative actions to extend productivity.

Software requirements (operating system):

- *Android version 6.0 and up*
- *Apple iOS version 10 and up*
- *Bluetooth version 4.0 and up*

The Chesterton Connect app is available as a free download, look for this symbol:



Application features

- **Security:** Encrypted setup and password protected operation
- **Personalization:** Configurable name and usage information
- **Data acquisition:** Monitoring mode for extended battery life (5 minute intervals) and high accuracy mode for troubleshooting (1 minute intervals)
- **Troubleshooting:** Live mode for streaming data every 2 seconds to smart phone app
- **Data storage:** Up to 30 days of rolling history
- **Alerts:** Configurable thresholds and alarms
- **Vibration grading:** Alerts users to long term vibration trend as good, caution, or bad through color coding of green, yellow and red respectively
- **Vibration:** Acceleration and velocity (RMS) in X, Y, and Z
- **Cloud:** Optional Cloud Analysis Environment for long term trending

App instructions

INTEGRATE WITH SENSOR

1. Download and open the mobile app, "Chesterton Connect". The app can be downloaded from Apple or Android mobile platforms. Software requirements:
 - *Android version 6.0 and up*
 - *Apple iOS version 10 and up*
 - *Bluetooth® version 4.0 and up*
2. Make sure "Bluetooth" is enabled on the mobile device and you are within the required range of 20 m max (~ 65') distance from the sensor.
3. Chesterton Connect™ communicates with the mobile device via Bluetooth. To enable Bluetooth scanning, it is required to allow the Chesterton Connect app to access the mobile device's location (see figure 1).
4. If sensor is not found, check the following:
 - *Bluetooth is turned on.*
 - *M12 connector is connected to the unit and the unit is on. The Unit's LED lights will flash green every 30 seconds indicating the unit is ready to be configured..*
 - *You are in range of the sensor, 20 m (~ 65').*
 - *Only one mobile phone is connected to the sensor (Bluetooth® only allows for one connection at a time).*



Figure 1

App instructions

REGISTERING YOUR NEW SENSOR

Once the sensor is connected to the mobile device is time to register your new sensor. Note each sensor requires a password to access the sensor settings and retrieve data.

1. Select the new “unregistered” sensor (see figure 2).
2. Enter a unique password for your sensor.
3. Retype your password.
4. Select **Next** (see figure 3).

5. The unit comes with a pre-configured name. Change the name for better identification, then fill out the sensor information (see figure 4).
6. Once all fields are completed, select **Save**.

Note: Password requirement is 20 characters max and only ASCII characters (shown below).

!"#\$%&'()+,-./0123456789;<=>?@ABCDEFGHIJKLMNPOQRST
UVWXYZ[\]^_`abcdefghijklmnopqrsts{}~*



Figure 2

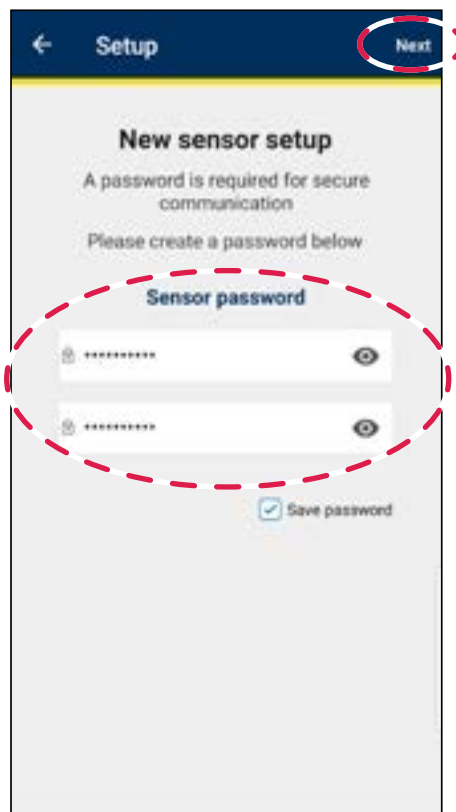


Figure 3

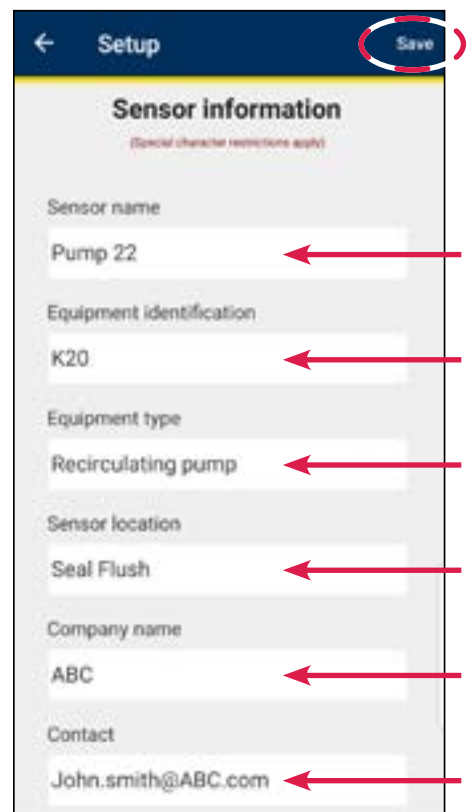


Figure 4

Note: Company name and contact name fields are not stored in the Chesterton Connect device. These fields are only visible for a new device setup.

App instructions

REGISTERING YOUR NEW SENSOR (CONTINUED)

7. Pair the Chesterton Connect app to sensor unit using Bluetooth® (see figure 5).

Ensure the following for easy pairing:

- Bluetooth is enabled on your phone
- You are in range of the sensor, 20 m (~ 65')

Note: Do not pair the sensor through the Bluetooth settings on your phone. Only pair the sensor to the Chesterton Connect app itself.

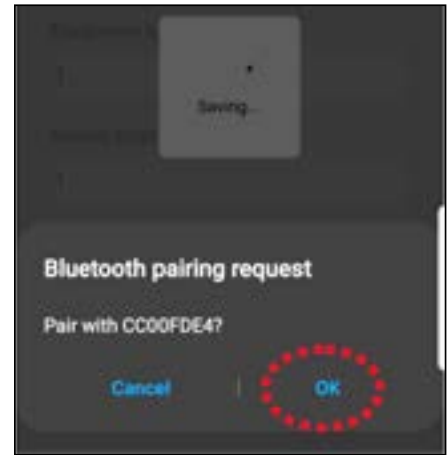


Figure 5

ESTABLISHING MEASUREMENT LIMITS

The sensor alarms are disabled by default. Sensor alarm parameters can be changed directly through the mobile app.

1. Select **Settings** (see figure 6).
2. Select **Configure Alarms** (see figure 7).

3. Alarms are disabled by default (grayed out). Tap on the empty check box above the slider to enable the alarm. Then adjust the slider to establish the min/max limits for your sensor (see figure 8). If measurements go above/below these limits, the Mobile App and LED alert system will alert you of any undesirable events.

Note: The average measurement recorded value is displayed both on the slider line as well as the upper right next to each measurement description. See green marks on figure 8.

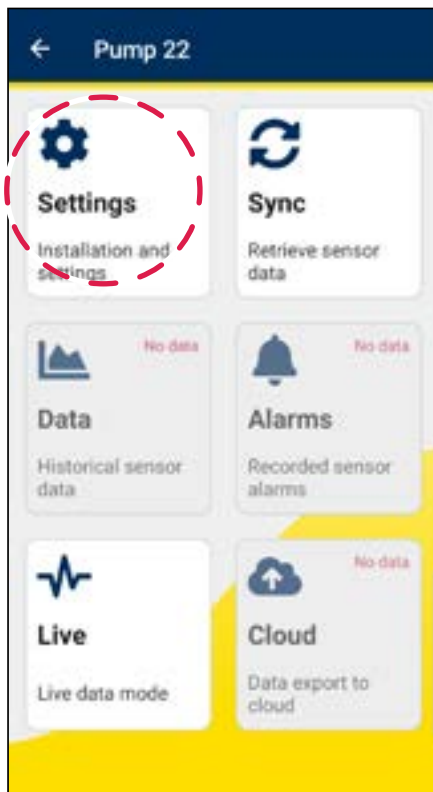


Figure 6

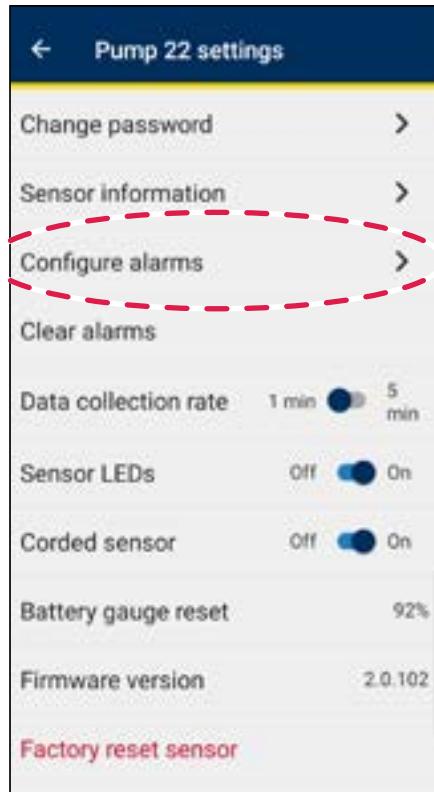


Figure 7

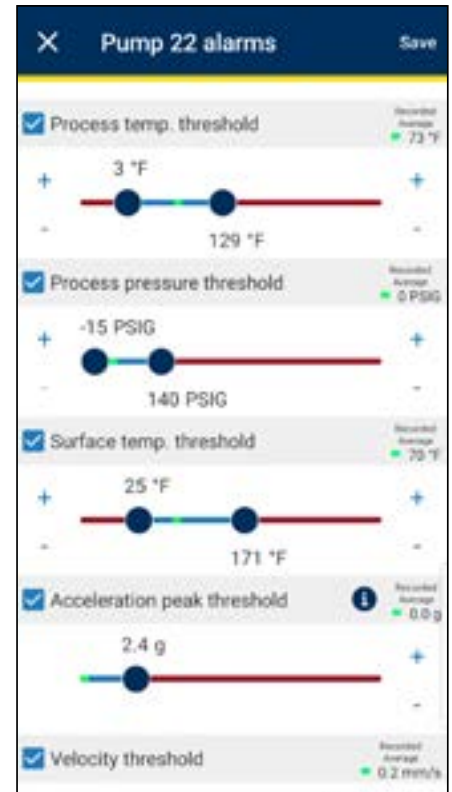


Figure 8

App instructions

DATA COLLECTION RATE

Chesterton Connect™ has two modes of data collection:

Fast (1 min): monitors the equipment condition every one minute. Battery life will be reduced when capturing data at this rate. Recommended for startup of equipment, or for faster monitoring.

Standard (5 min): monitors the equipment condition every five minutes. This is considered the standard operation for continuous monitoring. Battery life is normal.

To change the data collection mode follow these steps:

1. Select **Settings** (see figure 9).
2. Toggle the **Data Collection Rate** button to desired measurement rate (see figure 10).

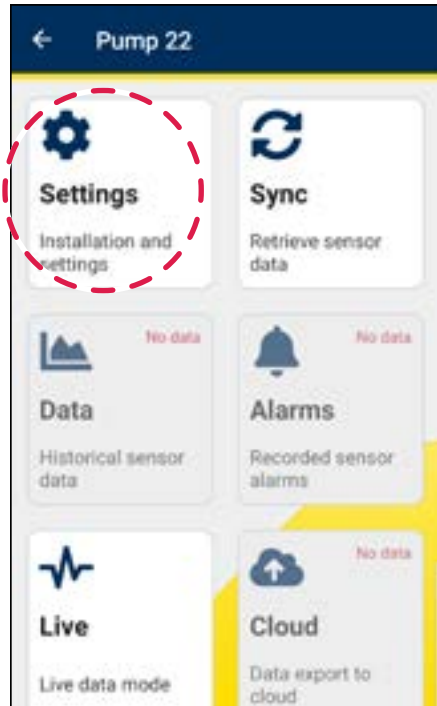


Figure 9

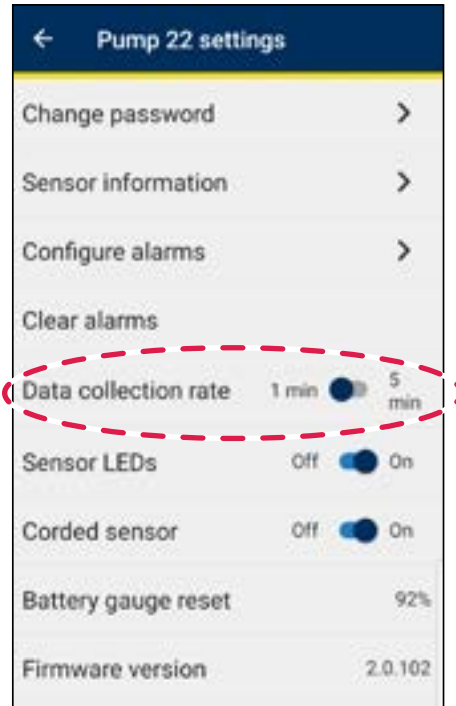
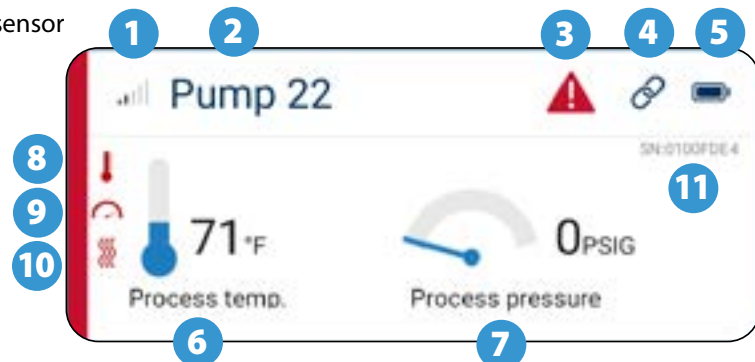


Figure 10

SENSOR APP MAIN SCREEN

- 1 Signal strength indicator
- 2 Sensor name
- 3 Alert indicators
- 4 Indicator if someone else is connected to the sensor (only one connection at a time is permitted)
- 5 Battery life indicator
- 6 Process temperature
- 7 Process pressure
- 8 Process/surface temperature alert
- 9 Process pressure alert
- 10 Vibration alert
- 11 Serial number



App instructions

RETRIEVING MEASURED DATA—SYNC MODE

1. Select the **Sensor** you want to retrieve the measured data from.
2. Select **Sync** (see figure 11).
3. Use the drop down menu to select the time period for **Data Retrieval** (see figure 12). Selecting longer sync periods will result in longer transfer times.

4. Select **Sync** (see figure 13).
5. Once the measured data is synced, the app will automatically go back to the main menu.

Note: If the sensor was not registered in your mobile device, a password will be required to sync the measured data.

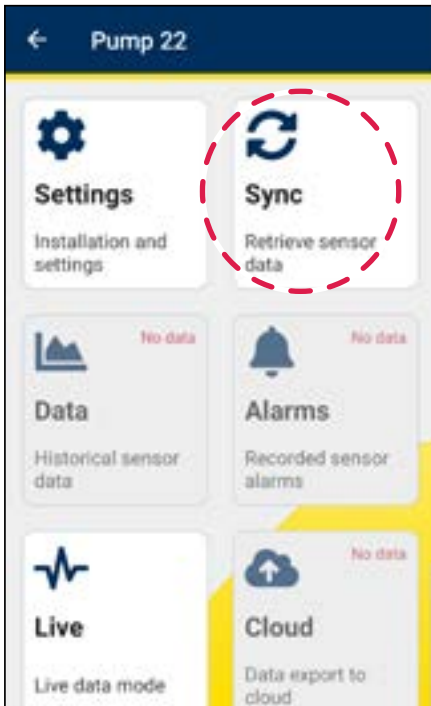


Figure 11

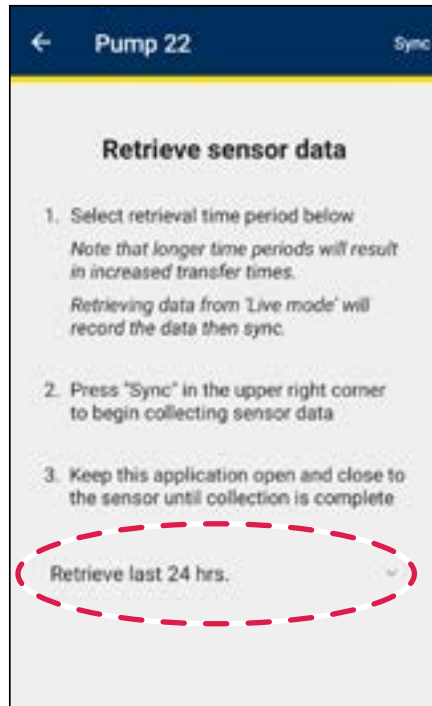


Figure 12

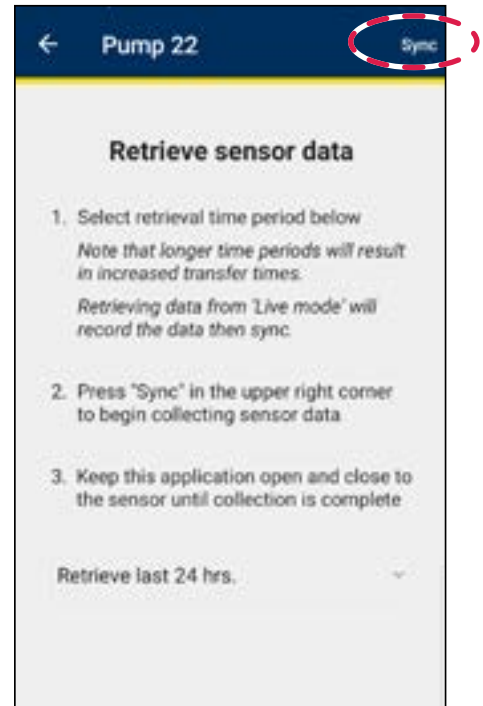


Figure 13

Note: To conserve battery life, in Sync Mode only, data will not be updated in the phone unless the data from the specific sensor changes by the following minimal amounts:

- >0.02 G Acceleration
- >2.5 F Process and Surface Temperature
- >2.5 PSI

App instructions

RETRIEVING MEASURED DATA—LIVE MODE

1. Select the sensor you want to retrieve the measured data from.
2. Select **Live** (see figure 14).
3. The app will automatically start collecting live data (see figure 15).

4. To stop collecting Live data, select the "back" arrow (see figure 15).

Note: Live mode allows 2 second data updates to the mobile app. Live mode is ideal for troubleshooting equipment problems or for higher fidelity data collection. Live mode will continue to collect until the user selects 'Stop'.

Warning – using Live mode can drain your battery.

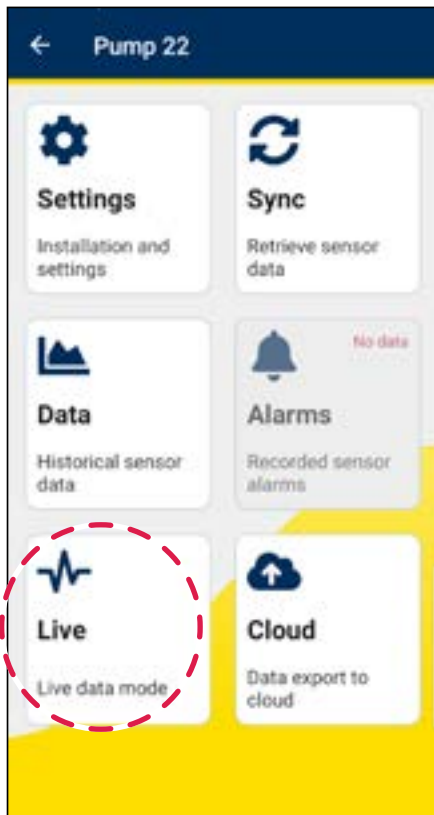


Figure 14



Figure 15

App instructions

VIEWING MEASURED DATA

Note: Sensor data must be synced to the mobile app to view graph data.

1. Choose the **Sensor** you want to view the measured data from.
2. Select **Data** (see figure 16).
3. Data graph will appear on your phone (see figure 17).

User Controls for the Data Graph (see figure 17):

- Pressure, temperature, and vibration each have their own graph section.
- Zoom in/out each measurement, by using pinch motion.
- Slide your finger on the graph to move back and forth in time.
- Moving back and forth in time moves all graphs to maintain time synchronization.
- Double tap the screen to go back to full graph view or focus on a specific selected measurement.

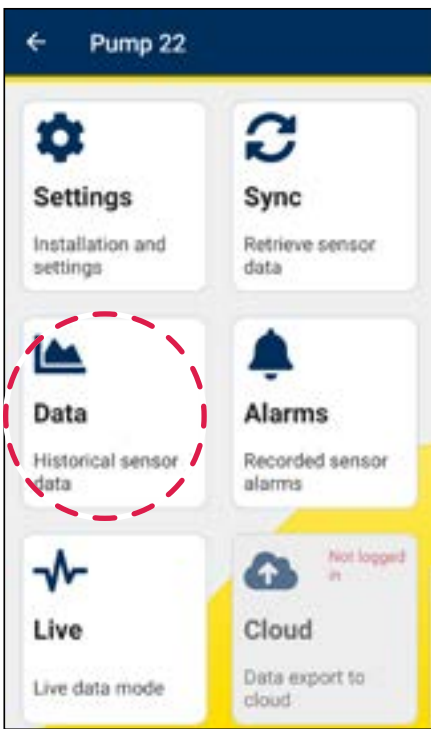


Figure 16

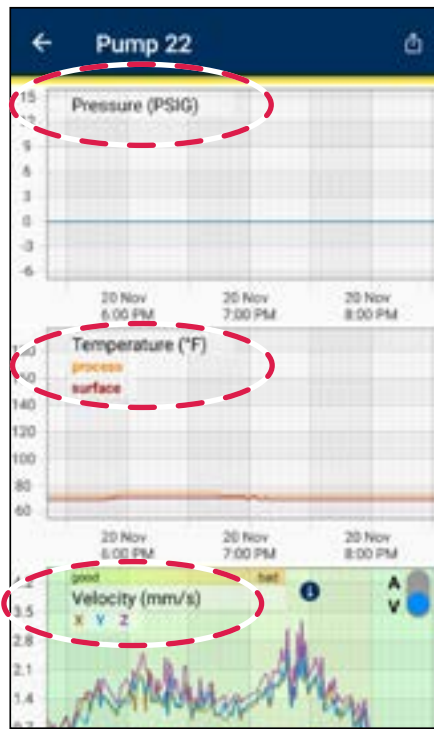


Figure 17

App instructions

VIEWING VIBRATION DATA

Vibration Velocity vs Acceleration

- Acceleration 0-peak and Velocity RMS are displayed in the same graph. Select the blue toggled button on the graph section to switch between V = Velocity, and A = Acceleration (see figure 18).

Vibration Grading

Vibration grading helps visualize vibration trends through color coding. To change the vibration grading threshold:

- Select the blue information icon (see figure 19).
- Select "Accept" once you have entered the preferred threshold values (see figure 20).

Application of Vibration Grading

The vibration grading can be applied to **Velocity** and **Acceleration** vibration measurements. Utilizing vibration grading the user can:

- Set hourly color-coded thresholds for the vibration. Example: Green is considered Good, Yellow is considered Caution, Red is considered Critical.
- Use + and - buttons to see impact of changing thresholds over time.
- Users should monitor their application and adjust accordingly.

Typical recommended thresholds are 2 g as caution" (yellow), and 5 g as "critical" (red).

The **alarm** set-point and the vibration grading color-coded views are independent. The alarm settings for vibration should be adjusted based on actual operation by an experienced personnel.

- Higher vibration thresholds can be accommodated for larger pumps and machines.
- Lower vibration thresholds may need to be set for smaller pumps and machines.

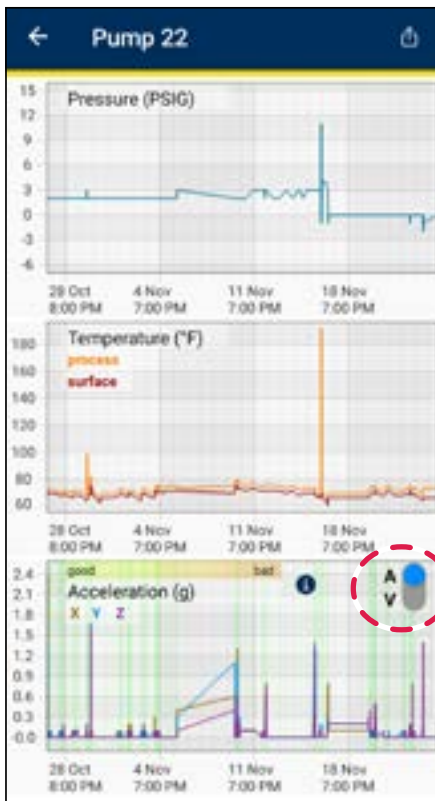


Figure 18

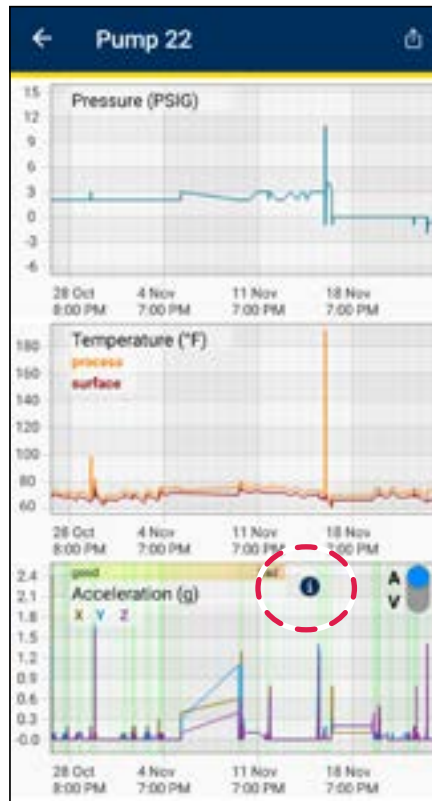


Figure 19

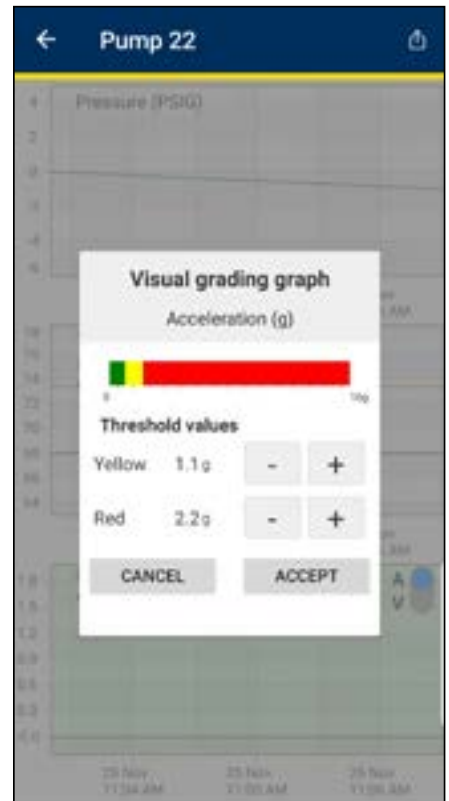


Figure 20

App instructions

EXPORT THE MEASURED DATA

1. Choose the sensor to export the measured data.
 2. Select **data** (see figure 21).
 3. Select the export icon (see figure 22).
 4. Select the preferred method to export the measured data. You will be prompted by your phone to select your preferred app to complete data export (see figure 23).
 5. Data is stored as a Microsoft® Excel® .xlsx file (see figure 24).
- For screenshot sharing graphs—consult your specific phone version manual for details.

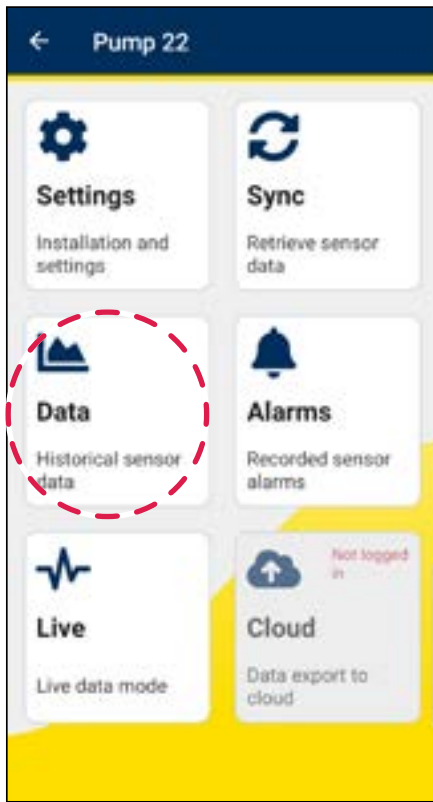


Figure 21

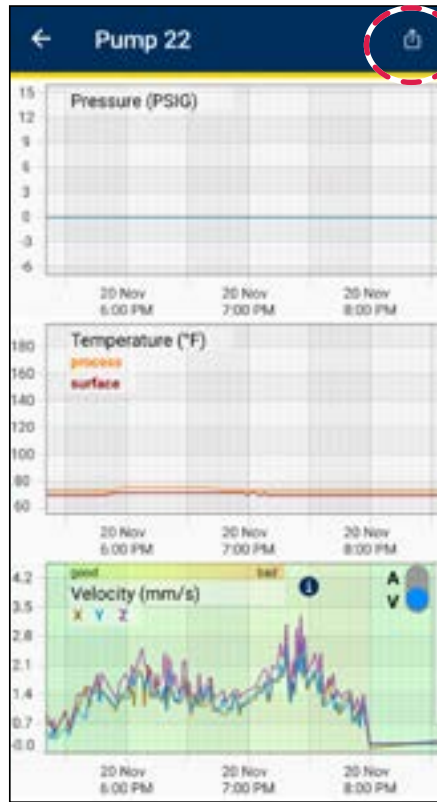


Figure 22

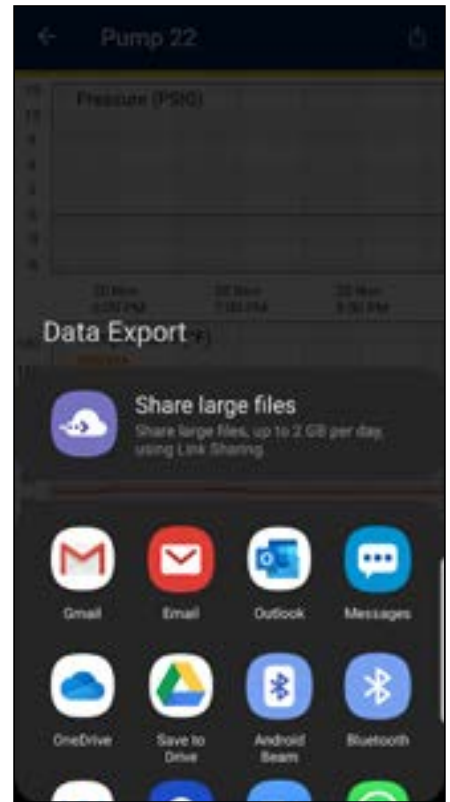


Figure 23

Timestamp	Metric	Value
10/14/2020 10:38:04 AM	Process Pressure (PSIG)	1.3
10/14/2020 10:38:04 AM	Process Temperature (°F)	76.6
10/14/2020 10:38:04 AM	Surface Temperature (°F)	73.2
10/14/2020 10:38:03 AM	Vibration acceleration peak X (g)	0.025
10/14/2020 10:38:03 AM	Vibration acceleration peak Y (g)	0.04
10/14/2020 10:38:03 AM	Vibration acceleration peak Z (g)	0.033
10/14/2020 10:38:03 AM	Vibration velocity RMS X (mm/s)	0.189
10/14/2020 10:38:03 AM	Vibration velocity RMS Y (mm/s)	0.302
10/14/2020 10:38:03 AM	Vibration velocity RMS Z (mm/s)	0.306
10/14/2020 10:38:02 AM	Process Pressure (PSIG)	1.3
10/14/2020 10:38:02 AM	Process Temperature (°F)	76.6
10/14/2020 10:38:02 AM	Surface Temperature (°F)	73.2
10/14/2020 10:38:01 AM	Vibration acceleration peak X (g)	0.025
10/14/2020 10:38:01 AM	Vibration acceleration peak Y (g)	0.034
10/14/2020 10:38:01 AM	Vibration acceleration peak Z (g)	0.043
10/14/2020 10:38:01 AM	Vibration velocity RMS X (mm/s)	0.162
10/14/2020 10:38:01 AM	Vibration velocity RMS Y (mm/s)	0.238
10/14/2020 10:38:01 AM	Vibration velocity RMS Z (mm/s)	0.278
10/14/2020 10:38:00 AM	Process Pressure (PSIG)	1.3
10/14/2020 10:38:00 AM	Process Temperature (°F)	76.6
10/14/2020 10:38:00 AM	Surface Temperature (°F)	73.2
10/14/2020 9:26:04 AM	Process Pressure (PSIG)	1.3
10/14/2020 9:26:04 AM	Process Temperature (°F)	75.7
10/14/2020 9:26:04 AM	Surface Temperature (°F)	70
10/14/2020 9:26:03 AM	Vibration acceleration peak X (g)	0.026
10/14/2020 9:26:03 AM	Vibration acceleration peak Y (g)	0.037

Figure 24

App instructions

ALARM CLEARING

An alarm is triggered if measurements are recorded outside the established limits. Once the measurements return to being inside the established limits, the mobile app and unit's LED indicator will remain in an alert state until the alarms are cleared.

There are two ways to clear alarms:

Option A

1. On the main sensor page:
 - For **IOS**: **swipe left** on the desired sensor (see figure 25). The identify/clear alarm option will appear.
 - For **Android**: **press and hold** the desired sensor (see figure 26). The identify/clear alarm option will appear.

Tap to select **Clear Alarm**

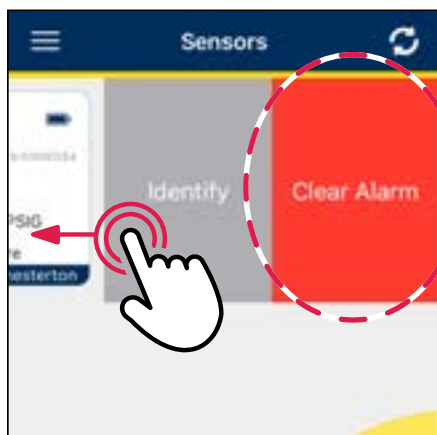


Figure 25

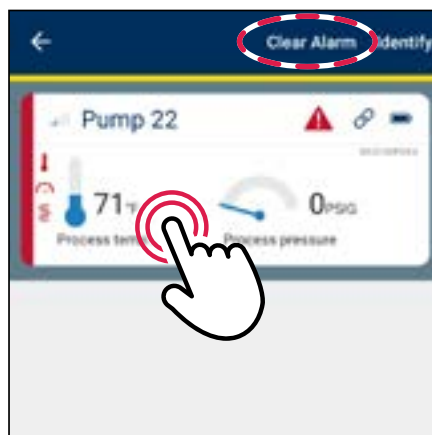


Figure 26

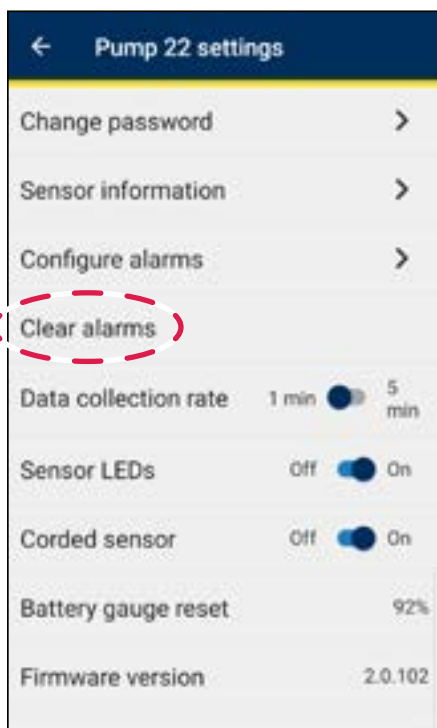


Figure 28

Option B

1. Choose the sensor you want to clear alarms.
2. Select **Settings** (see figure 27).
3. Select **Clear Alarms** (see figure 28).

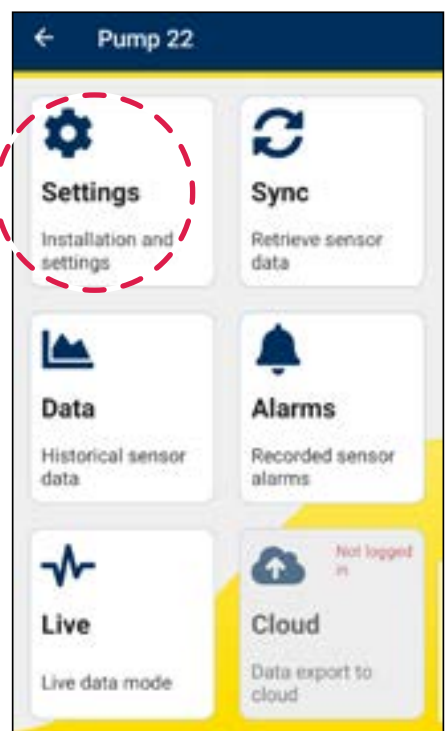


Figure 27

Change measurement units

1. Select the **Menu Icon** (see figure 29).
2. Select **App Settings** (see figure 30).
3. Use the drop-down menu to select the preferred Temperature, Pressure, and Vibration units (see figure 31).
4. Select **OK** (see figure 32).

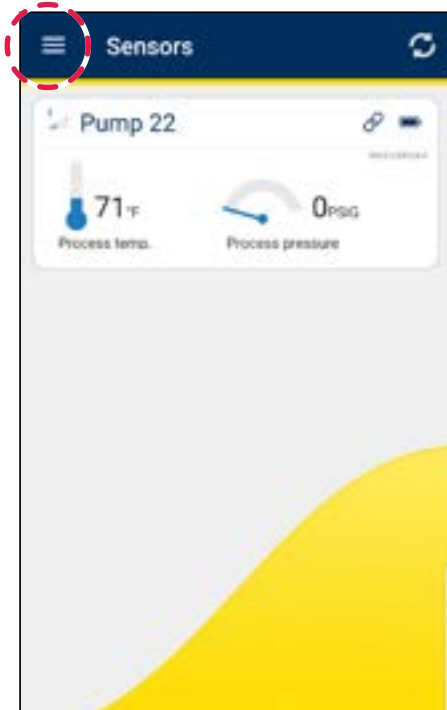


Figure 29

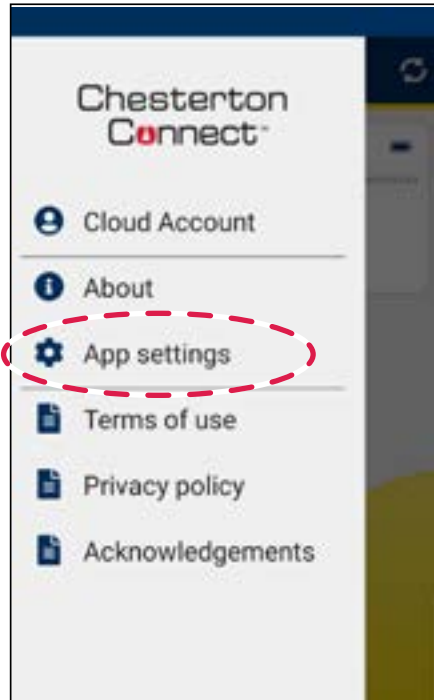


Figure 30

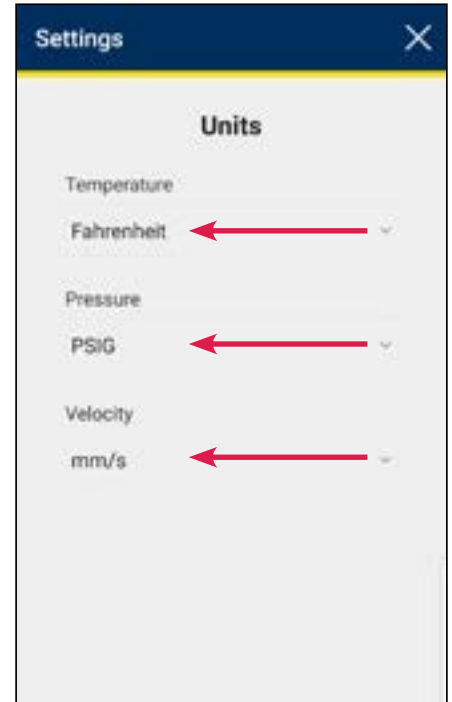


Figure 31



Figure 32

Connecting to Cloud

LOGGING INTO CLOUD ACCOUNT

1. Open app, select **Cloud Account** (see figure 33).
2. Select **Login** (figure 34).
3. The following message will pop-up: Chesterton Connect wants to use “davra.com” to sign in—click **Continue** (see figure 35).

4. The web browser will open. On the web browser, enter the **Username** (Company email address) and **Password** (see figure 36).
5. Select **Submit** (see figure 37).

Note: Please contact connect.support@chesterton.com to request a Cloud account.

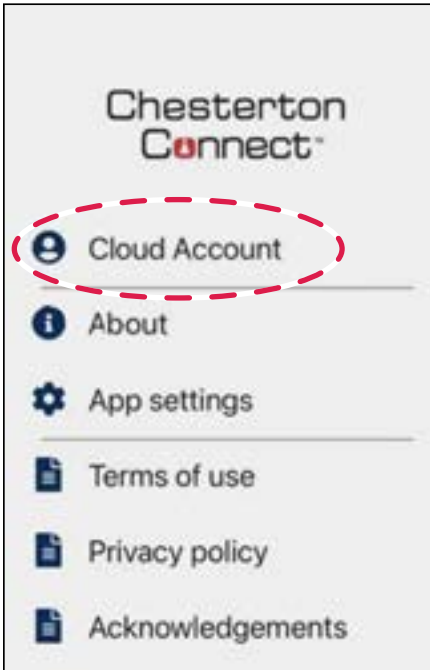


Figure 33

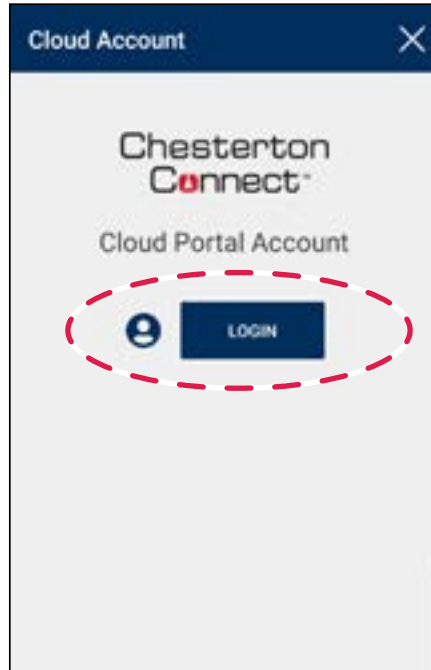


Figure 34



Figure 35

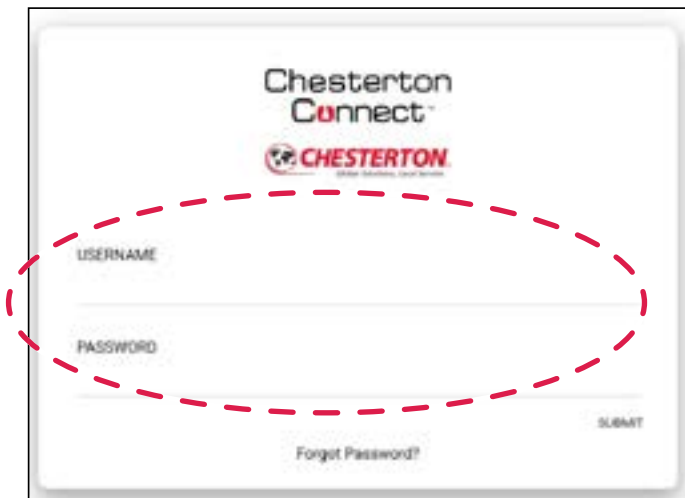


Figure 36

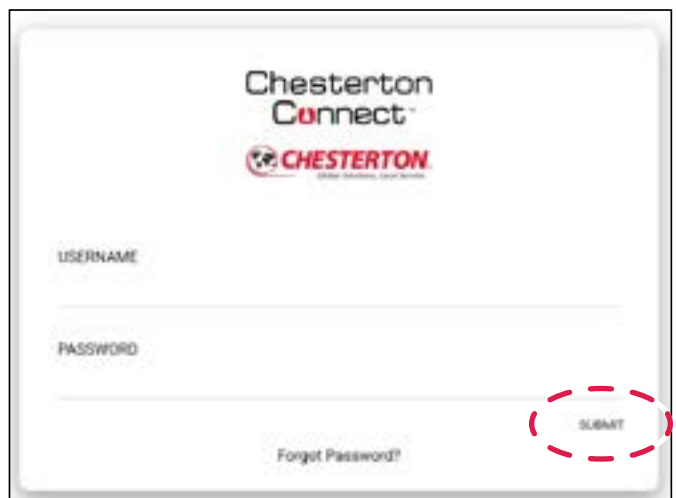


Figure 37

Connecting to Cloud

EXPORT DATA TO CLOUD

1. Log into Cloud Account.
2. Choose the sensor you want to export data.
3. Sync the sensor data with Bluetooth® (see figure 38).
4. Select sensor **Data Export to Cloud** (see figure 39).
5. The Export data progress bar will be display until export is completed (see figure 40).

Note: Sensor data must be synced to the mobile app to export data to the Cloud.

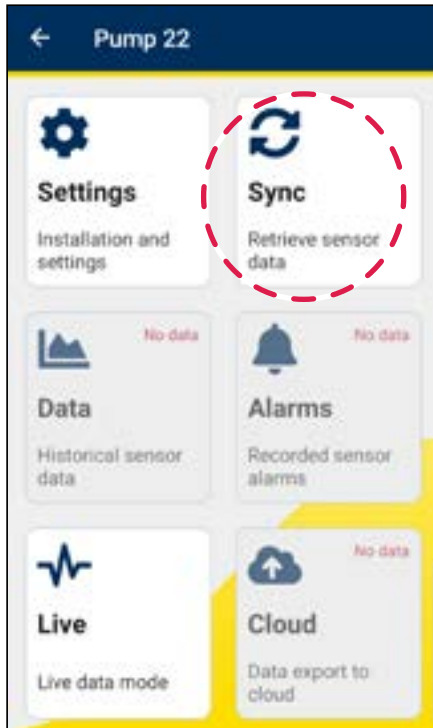


Figure 38

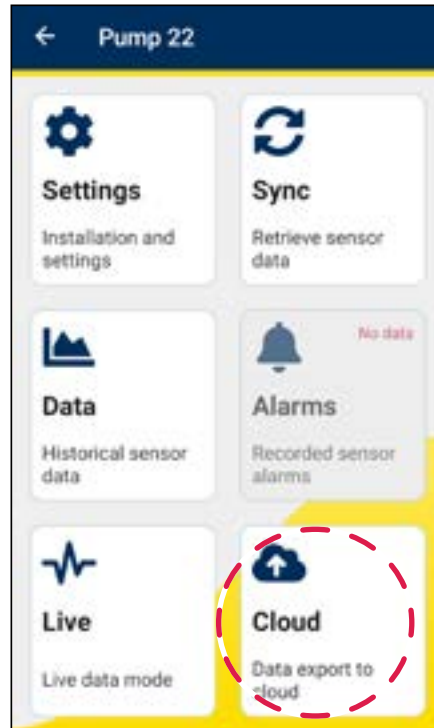


Figure 39

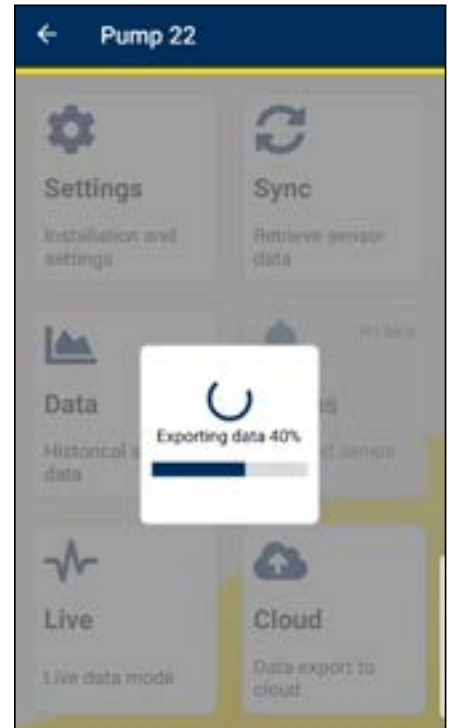


Figure 40

Troubleshooting

FINDING YOUR SENSOR

A great feature of Chesterton Connect™ is the ability to locate the sensor when installed. To utilize this feature, the mobile device must be in range of the sensor, 20 m (~ 65').

1. On the main sensor page:

- For **IOS**: **swipe left** on the desired sensor (see figure 41). The identify/clear alarm option will appear.
- For **Android**: **press and hold** the desired sensor (see figure 42). The identify/clear alarm option will appear.

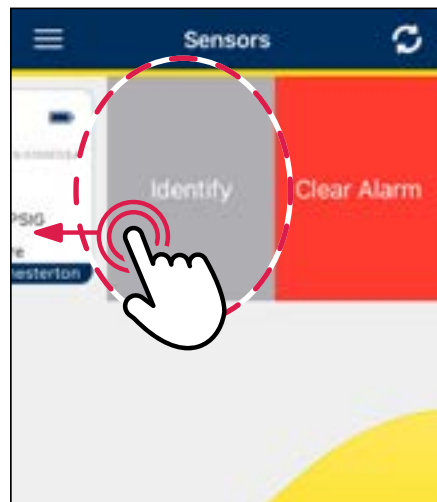


Figure 41

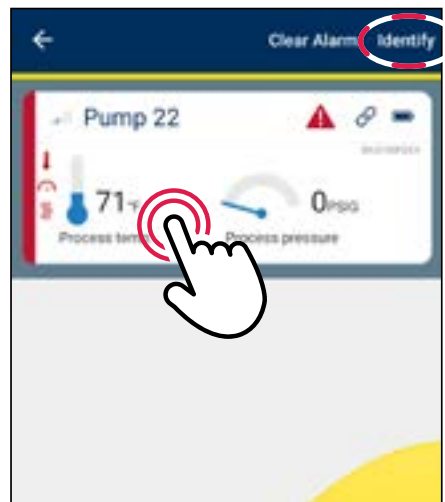


Figure 42

2. Tap to select **Identify**.

The sensor LED will blink blue three times to alert of its location (see figure 43).



Figure 43

REMOVE A SENSOR FROM THE MOBILE APP

1. On the main sensor page:

- For **IOS**: **swipe left** on the desired sensor (see figure 44). The Delete option will appear.
- For **Android**: **press and hold** the desired sensor (see figure 45). The identify/clear alarm option will appear.

Note: The delete feature will only work if the sensor is out of range or powered off. Also note that deleting the sensor will remove all associated data and credentials from the App.

2. Tap to Delete.

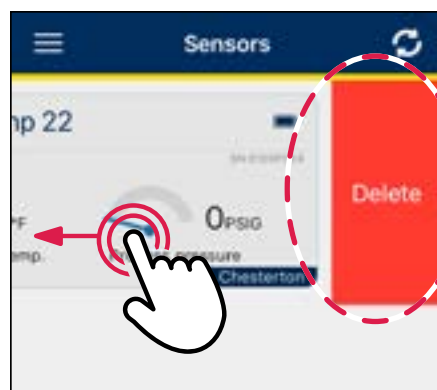


Figure 44

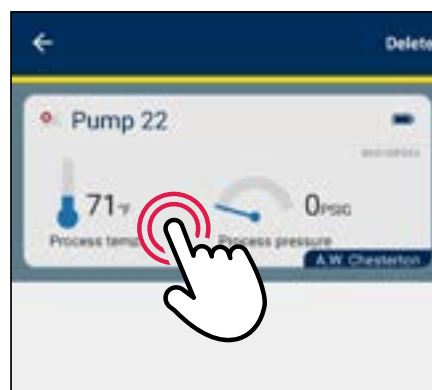


Figure 45

Troubleshooting

POWER CYCLING

Power cycling is a useful method to diagnose sensor's operation. The unit's LED will flash red, green, and blue after performing a successful power cycle.

Note: If the unit's LED does not flash red, green, blue, after performing a power cycling contact customer support.

1. Disconnect the M12 pin connector from the unit. This will turn the unit off. Ensure the P/T cable is safely secured.
2. Wait 5 seconds. Note will take 30 seconds to recognize the unit.
3. Reconnect the M12 pin connector to the unit. This will activate the unit. Turn the nut until it is finger tight.
4. Once reconnected, the **Clock Icon** will be displayed next to the battery level icon (see figure 46).

Any data that you previously had in the device and your phone is still there, no data is lost during power cycling.

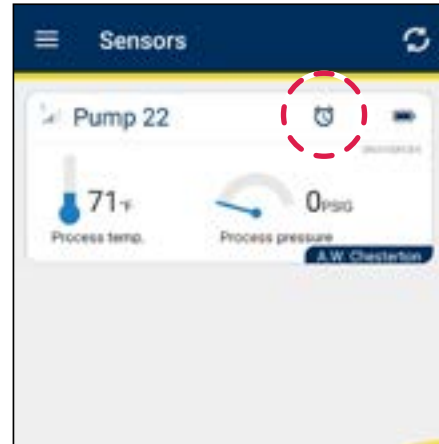


Figure 46

BATTERY CHANGING

If the sensor battery is replaced, the battery gauge must be reset. To reset the battery gauge:

1. Select the sensor you want to reset the battery.
2. Select **Settings** (see figure 47).

3. Select Battery gauge reset (see figure 48).
4. A Warning will appear, click **Yes** and reset to 100% battery (see figure 49).

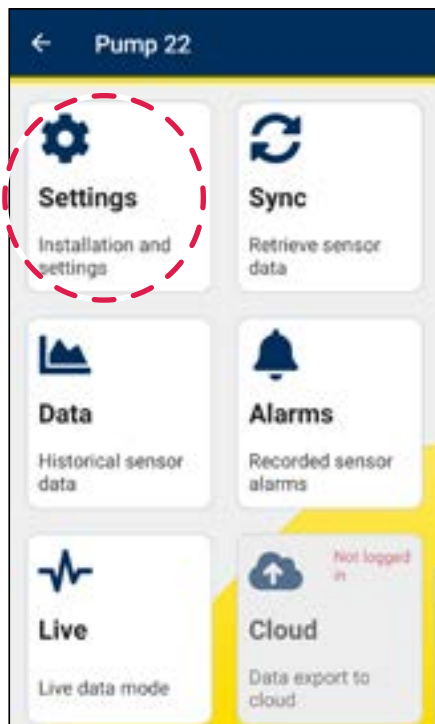


Figure 46

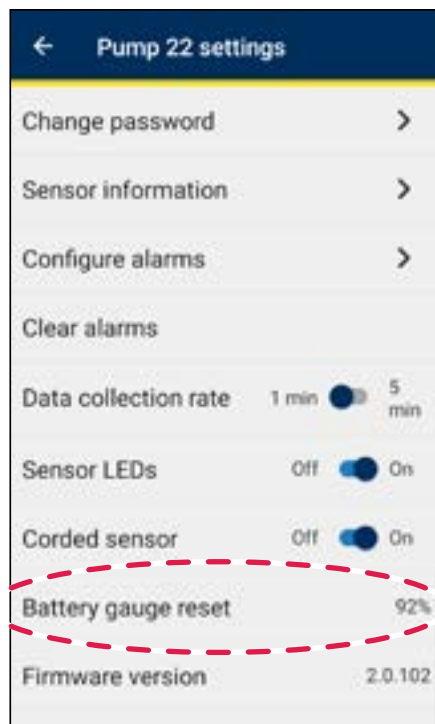


Figure 48

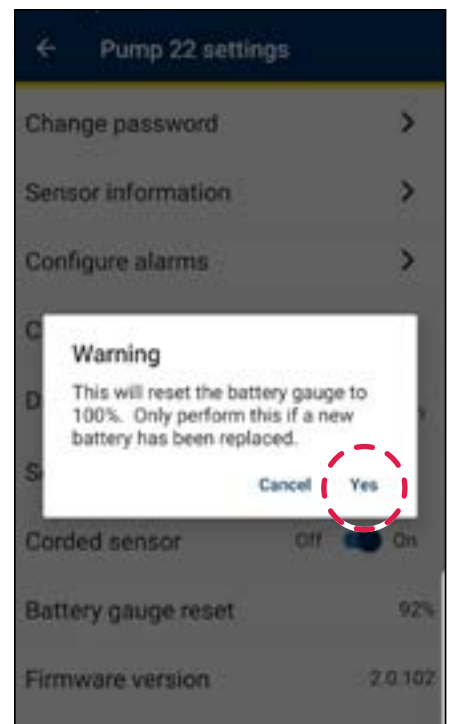


Figure 49

Troubleshooting

FACTORY RESETTING

There are two methods to doing a factory reset on the Chesterton Connect device. **For both methods, the M12 pin connector must stay connected.**

Option A: This factory reset option only works when you have the sensor password.

1. Go to the **Settings** page (see figure 50).
2. Select **Factory Reset Sensor** (see figure 51).

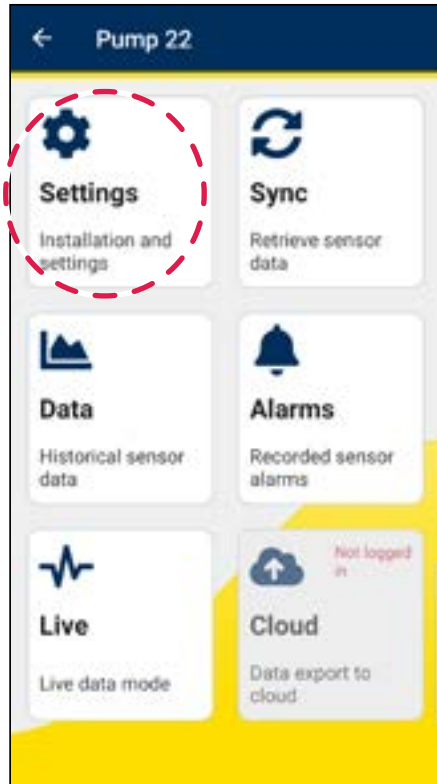


Figure 50



Figure 51



Figure 52

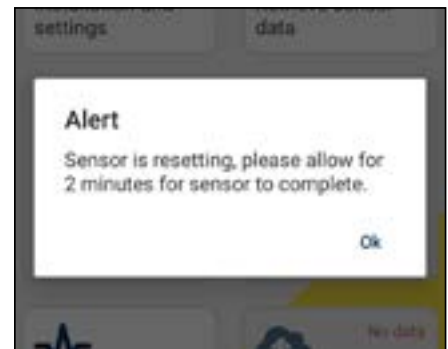


Figure 53

3. Once initiated, the unit will ask if you wish to continue, select **Yes** (see figure 52).
4. After selecting yes, the unit warns the user that the sensor is resetting, wait 2 minutes for the reset process to complete (see figure 53).
5. Once factory reset, **all data is lost**, and the unit becomes a new device.

Option B: This factory reset option helps users recover their units if password is forgotten. This factory resetting option shall only be performed in a clean and dry location. Avoid contact with any liquids or contaminants.

1. Once in a clean and dry location, unscrew top housing.
2. Press and hold the top **“Reset”** button down for 15 seconds (see figure 54). The LED will flash red and green.
3. After the LED flashes, release the **“Reset”** button. Wait 2 minutes for power up.
4. Reattach the top housing and turn until it is finger tight.

A factory reset **deletes all measured** data stored in the unit but synced data to your mobile device will remain.

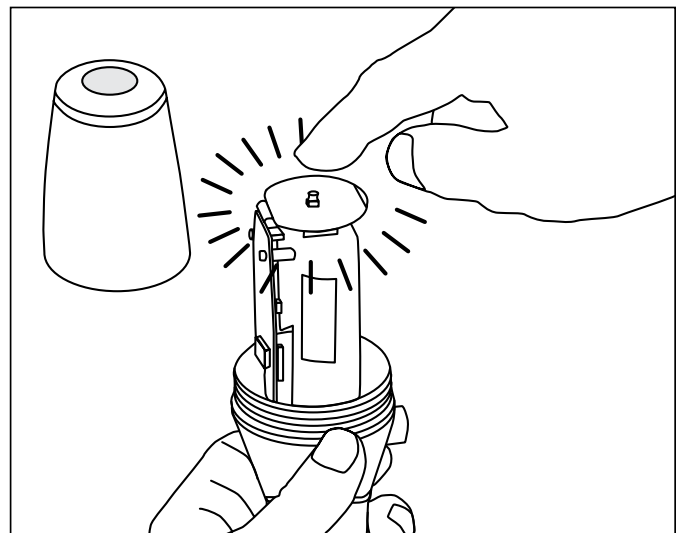


Figure 54

Versions and Updates

Device Versions: Should there be any Firmware updates, the available updates for the sensor will be displayed (see figure 55). Follow the **Blue Circle** in the **Settings** menu (see figure 55).

3. In the product update pop-up window, select **Yes** and follow the prompts to start and finish updates installation (see figures 59, 60, and 61).

1. Select **Settings** (figure 56).

4. New sensor **Firmware Version** will be displayed in the settings page (see figure 61).

2. Select **Update Available** (figure 57).

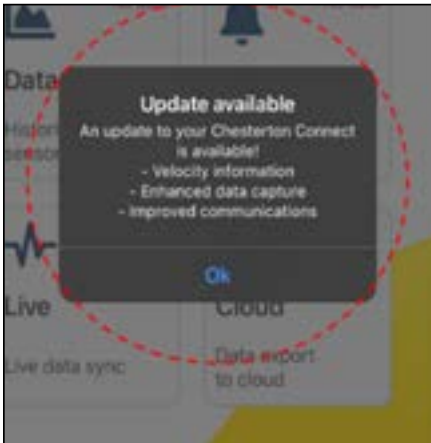


Figure 55

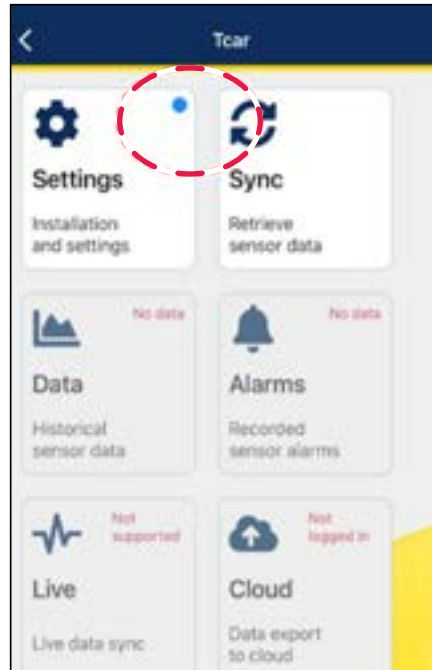


Figure 56

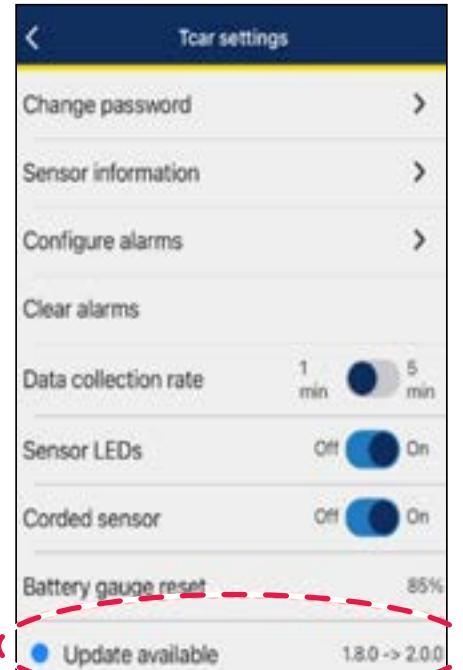


Figure 57

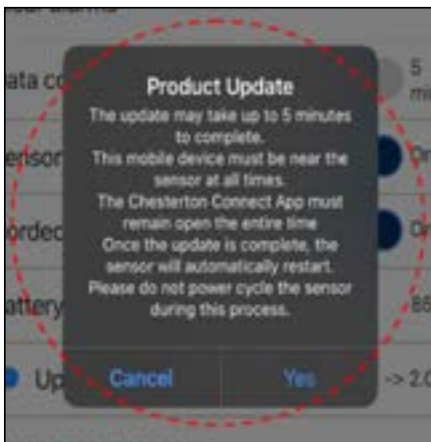


Figure 58

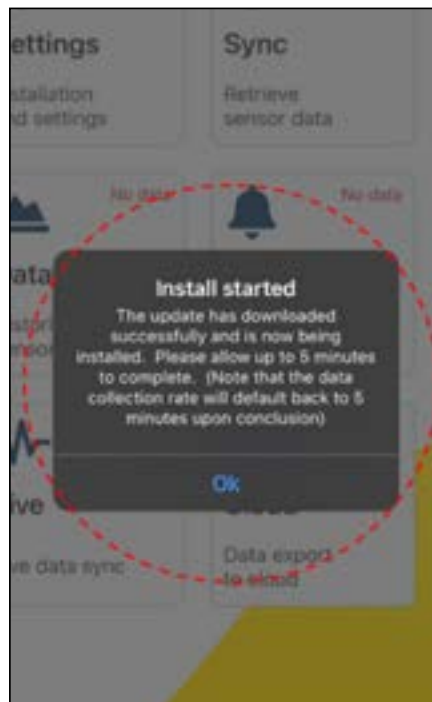


Figure 60



Figure 59

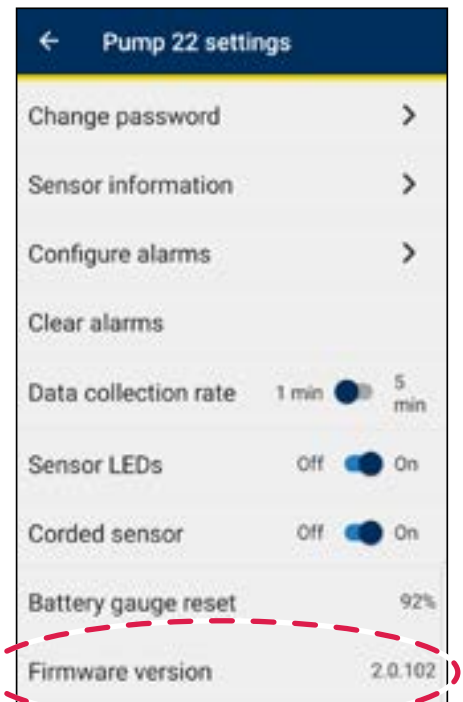


Figure 61

Versions and Updates (continued)

Technical Support: Connect.support@chesterton.com

Sensor Version

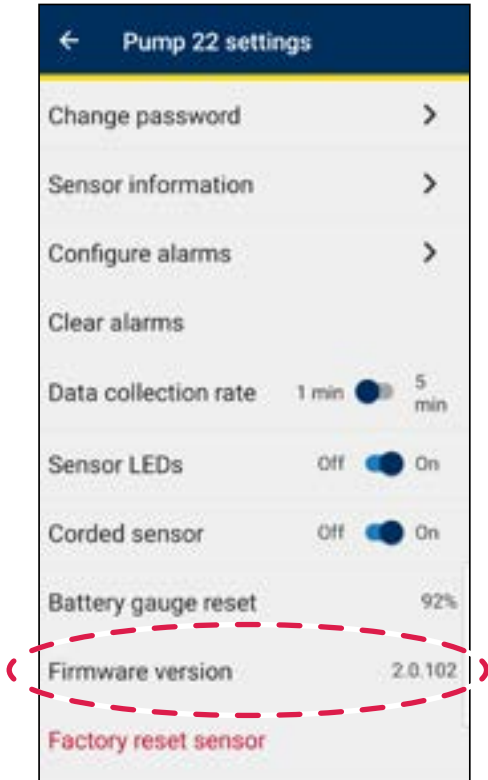


Figure 62

App Version

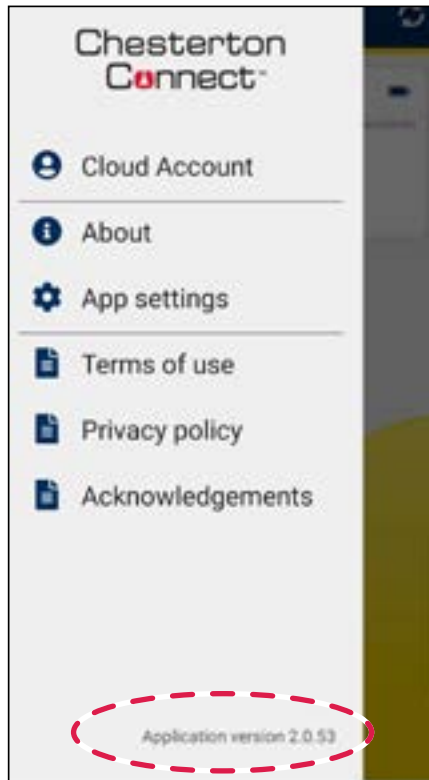


Figure 63

FAQ's

How do I turn on the Chesterton Connect smart sensor?

ANSWER: The Chesterton Connect sensor automatically turns on when you plug the sensor cord (M12 connector) into the base unit. If you are not planning on measuring process temperature and pressure via the corded M12 sensor, and only need the vibration and surface temperature measurements for your application, there is an optional M12 plug you can install to power-up the sensor.

Can more than one person get data from the Chesterton Connect smart sensor?

ANSWER: Yes. The only requirement is to know the Chesterton Connect sensor password. Anyone with the Chesterton Connect phone app can connect to any Chesterton Connect device as long as the password is known. If sharing devices and security is not a concern, you might consider a common password for all sensors at your facility.

I see a gap in the data when I export the data, why is that?

ANSWER: The Chesterton Connect device will only record and store new sensor data if and only the measured value is greater than a defined threshold from the previous reading. That threshold is defined on page 7 in this document. The only exception is Live Mode, in which all sensor data is updated every 2 seconds.

I see a white gap in the vibration graph, why is that?

ANSWER: Per the previous answer, if there is no change in values there is also the potential for a gap in the graph. For example: if the equipment is not running, and there is no new data, there will be a gap in the vibration graph that is white (no data). This is by design.

FAQ's (continued)

Where should I set my vibration grading threshold?

ANSWER: The Chesterton Connect sensor outputs vibration data in two forms; Acceleration 0 peak and velocity (RMS). The Vibration Grading threshold recommended for acceleration is 2 g warning (yellow) and 5 g critical (red). For velocity, the ISO 10816 standard is often used as a reference (see figure 64).

As there are many variables associated to vibration monitoring such as: mounting method, mounting location, sensor type, etc., it is recommended the sensor be used to monitor trends and repeatability of measurements.

Velocity RMS per ISO 10816-7*				Velocity RMS per ISO 10816-1**			Acceleration (g)***		
Category	(mm/s)	Warning	Alarm	Class	Warning	Alarm	Class	Warning	Alarm
I (a)	<200kW	5	8.3	1	1.12	7.1	Default	2	5
I (b)	>200kW	6.3	9.5	2	1.8	11.2			
II (a)	<200kW	6.4	7.6	3	2.8	18			
II (b)	>200kW	10.6	11.9	4	4.5	28			
* Category I	High Reliability for safety reasons (toxic or hazardous liquids)								
Category II	Pumps for general or less critical applications								
** Class 1	Small Machines								
Class II	Medium Machines								
Class III	Large Machines with rigid foundation								
Class IV	Large Machines with soft foundation								
***	Acceleration not based on standard but on Chesterton recommendation								

Figure 64

Privacy policy

To view Chesterton's privacy policy please visit:
<https://chesterton.com/en-US/Pages/Privacy.aspx>

For more information

Go to: [Chestertonconnect.com/product](https://chestertonconnect.com/product)

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