

Xact Gauge Reader System

Operation Manual

XLL100300 – Rev. 1.0

Productivity through Precision™



A product of:

Schmitt Industries, Inc.

2765 NW Nicolai Street
Portland, Oregon 97210 USA
Phone: 503-227-7908
<http://www.xact-data.com>



A Product Line of Schmitt Industries, Inc.



Limited Use License Agreement

CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE OPENING THE PACKAGE CONTAINING THE PRODUCT AND THE COMPUTER SOFTWARE LICENSED HEREUNDER. CONNECTING POWER TO THE MICROPROCESSOR CONTROL UNIT INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE WITH THE TERMS AND CONDITIONS, PROMPTLY RETURN THE UNIT TO THE DEALER FROM WHOM YOU PURCHASED THE PRODUCT WITHIN FIFTEEN DAYS FROM DATE OF PURCHASE AND YOUR PURCHASE PRICE WILL BE REFUNDED BY THE DEALER. IF THE DEALER FAILS TO REFUND YOUR PURCHASE PRICE, CONTACT SCHMITT INDUSTRIES, INC. IMMEDIATELY AT THE ADDRESS FOLLOWING CONCERNING RETURN ARRANGEMENTS.

Schmitt Industries, Inc. provides the hardware and computer software program contained in the microprocessor control unit. Schmitt Industries, Inc. has a valuable proprietary interest in such software and related documentation ("Software"), and licenses the use of the Software to you pursuant to the following terms and conditions. You assume responsibility for the selection of the product suited to achieve your intended results, and for the installation, use and results obtained.

License Terms And Conditions

- a. You are granted a non-exclusive, perpetual license to use the Software solely on and in conjunction with the product. You agree that the Software title remains with Schmitt Industries, Inc. at all times.
- b. You and your employees and agents agree to protect the confidentiality of the Software. You may not distribute, disclose, or otherwise make the Software available to any third party, except for a transferee who agrees to be bound by these license terms and conditions. In the event of termination or expiration of this license for any reason whatsoever, the obligation of confidentiality shall survive.
- c. You may not disassemble, decode, translate, copy, reproduce, or modify the Software, except only that a copy may be made for archival or back-up purposes as necessary for use with the product.
- d. You agree to maintain all proprietary notices and marks on the Software.
- e. You may transfer this license if also transferring the product, provided the transferee agrees to comply with all terms and conditions of this license. Upon such transfer, your license will terminate and you agree to destroy all copies of the Software in your possession.

Operation and Specification Manual

for the

Xact Gauge Reader System

XLL100300 – Revision 1.0


© 2013 Schmitt Industries, Inc.




2765 NW Nicolai St.
Portland, OR 97210 USA
Phone: (503) 227-7908

Fax: (503) 223-1258

www.xact-data.com

U.S. Patent Numbers.
7,905,143, 7,245,059, and 7,287,425,
8,104,341
and other patents pending.

Suitable for use in:
Class I Division 2 Group D
Class I, Zone 2 Group IIA ( nL 3 G IIA T6)
Non Incendive field wiring outputs for Class I, Division 2, Group D
See control drawing in Appendix A of this manual

 Schmitt Industries, Inc. 2765 NW Nicolai St. Portland, OR USA Phone: 503-227-7908 www.xact-data.com	Model: XACT-02 series Manf. Date: <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block;"></div>	
	<div style="border: 2px solid black; padding: 2px; display: inline-block;"> Class I, Division 2 Group D </div>	
	<div style="border: 2px solid black; padding: 2px; display: inline-block;"> Class I, Zone2 Group IIA </div>	
	<div style="border: 2px solid black; padding: 2px; display: inline-block;">  nL 3 G IIA T6 </div>	
<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 60%;"> <p style="text-align: center; margin: 0;">WARNING – EXPLOSION HAZARD – BATTERY MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.</p> <p style="text-align: center; margin: 0;">AVERTISSEMENT – RISQUE D'EXPLOSION – AFIN D'EVITER TOUT RISQUE D'EXPLOSION, S'ASSURER QUE L'EMPLACEMENT EST DESIGNE NON GANGEREUX AVANT DE CHANGER LA BATTERIE</p> <p style="text-align: center; margin: 0;">WARNING – EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS FOR CLASS I, DIVISION 2</p> <p style="text-align: center; margin: 0;">AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATERIEL INACCEPTABLE POUR LES EMBLEMENTS DE CLASSE I, DIVISION 2</p> </div> <div style="width: 35%; text-align: center; padding-top: 10px;"> <p>ETL CLASSIFIED</p>  <p>Intertek 4000718</p> </div> </div>		

Warning: Explosion Hazard. Do Not Remove or Replace Lamps, Fuses, Battery or Plug-In Modules (As Applicable) Unless Power Has Been Disconnected or the Area Is Known To Be Free Of Ignitable Concentrations of Flammable Substances

NOTICE:
SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR DIVISION 2 ASSEMBLE AS SPECIFIED

Table of Contents

System Purpose	1
Operator Safety Summary	1
Xact System Overview	2
System Installation	3
Selecting Install Location on the Tank	3
Measuring Tank Dimensions	3
Installation of Hall Effect Module.....	3
System Setup and Calibration	4
Activating your application	4
New Installation	5
Set Monitoring Mode	6
Setting Alarm Levels in Event Monitor Mode	6
Setting Measurement Cycles in Scheduled Monitoring Mode	6
Enter Tank Dimensions.....	7
Gauge Face Selection	9
Calibration	10
Final Hardware Installation.....	11
Changing The Battery.....	12
Troubleshooting	13
System Wiring Schematic.....	14

System Purpose

The Xact Gauge Reader System was developed to provide you with a cost effective reliable means of monitoring your inventory. Giving you an up to date and reliable account of how much product is in your tank, will help eliminate outages, partial deliveries, and costly emergency deliveries. This will allow you to concentrate on expanding your customer base and reduce costs. Some of the information offered from the website includes: fill percentage, ullage, gallons/liters in tank, and history of measurements. The Xact Gauge Reader System also allows you to define tank level alarms, which will report directly to your email to notify you of the events when they happen, saving you valuable time.

Operator Safety Summary

This summary contains safety information necessary for operation of the Xact Gauge Reader System for liquid filled tanks. Specific warnings and cautions are found throughout the manual where they apply, but may not appear in this summary. Before installing and operating the Xact Gauge Reader System, it is necessary to read and understand the entirety of this manual. After reading this Operation Manual, contact Schmitt Industries Inc. if any additional technical assistance is required.

Caution: Complies with FCC RF Exposure Requirements. Users and nearby persons must maintain a separation distance of greater than 20cm (8 inches) from this antenna in operation.

Caution: To avoid equipment damage, do not drop or mistreat.

Caution: Only trained service technicians should attempt to perform service on Xact Gauge Reader Systems. Disconnect battery power before removing or connecting cables to the Xact components, if such connections exist on your Gauge Reader product.

Caution: This is a low voltage system, do not alter or adjust system input voltage in any manner. Substitution of components may impair suitability for Division 2.

Warning: EXPLOSION HAZARD – BATTERY MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.

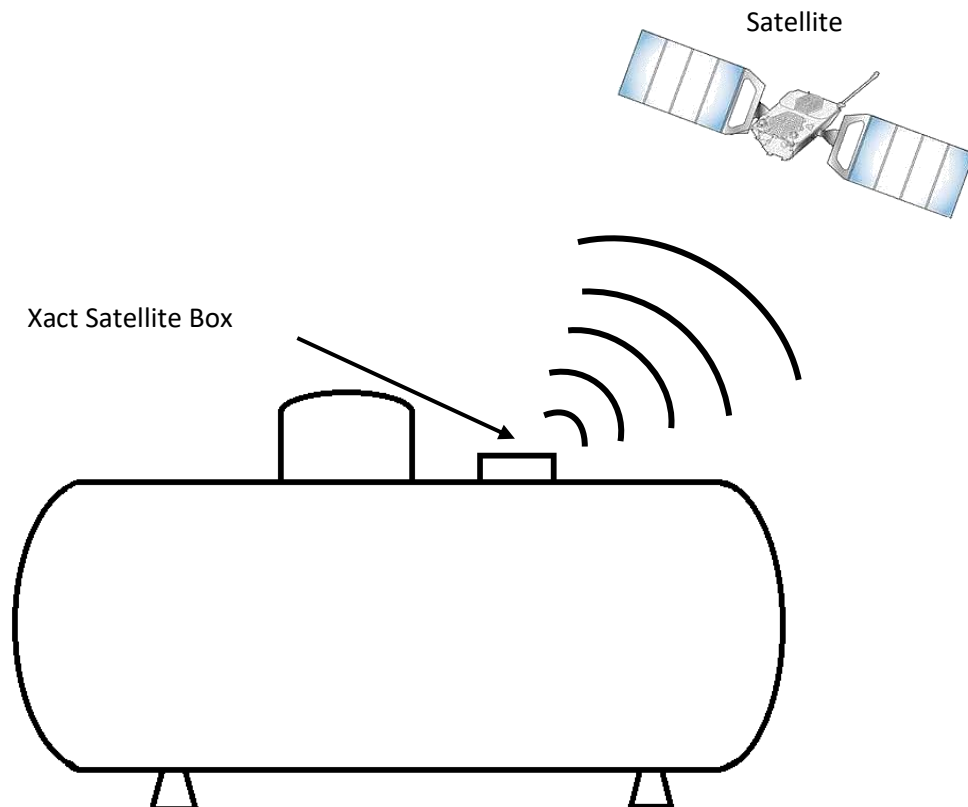
Warning: EXPLOSION HAZARD – BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS FOR CLASS I, DIVISION 2

Xact System Overview

The Xact Gauge Reader System consists of two parts: the Hall Effect Module and Satellite Box. These parts are designed to be easily installed and configured for use by the end user. During installation, the system is located in place on the tank with the attached magnets and is secured in place using the supplied strap at the completion of installation.

The **Hall Effect Module** is designed to snap-fit into the recess in the remote ready dial face. Once installed, the module can provide ratiometric voltage output proportional to the liquid volume inside the tank. By measuring the voltage output, referenced against tank capacity, tank fill levels are automatically calculated and displayed on the Xact Website.

The **Satellite Box** is mounted to the top of the tank and sends the measurement data via satellite to a secure customer website. The measurement data includes: time and date, fill level, tank capacity, and various alarm settings. It also provides access to the system's user interface with the aid of the Xact Installation Software, allowing set up and configuration of the system on a specific tank. Alarm levels can be set during the installation to notify the user of a refill needed, critical fill level, or a refilled event. The battery is also conveniently located in this box.



System Installation

The Xact Gauge Reader System can be easily installed in a short period of time. This section provides instructions for mounting the system on the exterior of the tank. Included are sections covering necessary preparation and installation of the Hall Effect Module and the Xact Satellite Box onto the tank.

Remove the components from the shipping box and inspect all devices for any potential shipping damage. Connect the sensor cable to the Satellite Box if it is not already done. It is vital that this connection is fully engaged to prevent any water damage!

Selecting Install Location on the Tank

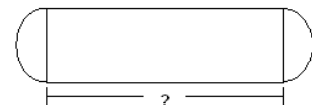
It is important to locate the Xact System on the tank in a safe and convenient location. Special attention should be paid to the location of fill points and discharge piping so as to not interfere with the installation process.

Measuring Tank Dimensions

The Xact Gauge Reader is unique in it does not require the dimensions of the tank for fill level reporting. If you know the size of your tank, you will not need to measure it. If you are unsure of the size of tank, follow the next few steps to come up with an accurate tank capacity.

Determine each of the following four measurements for the tank undergoing installation, and write these measurements down using consistent units of measure (Inches or Centimeters) in preparation for system setup and calibration.

- Measure the circumference of the tank using a flexible tape measure.
- Locate the manufacturer nameplate to determine the tank wall thickness. If this number is stated in a fractional form (e.g. 1/6"), divide the top number by the bottom number to calculate a decimal thickness measurement (e.g. 0.166).
- Measure the length (from weld seam center to weld seam center).
- Determine if the tank ends are Hemispherical or Elliptical.



Installation of Hall Effect Module

The Hall Effect Module is connected to the Remote Ready dial face located on the exterior of the float gauge. If the dial face that is currently installed on the tank is not remote ready, remove it and replace it with a remote ready dial face. Remove the black dust cap by lifting up on the end and sliding out. Slide the Hall Effect module into the grooves of the remote ready dial until it snaps into place. Ensure that this is seated firmly before moving on.

The Xact Gauge Reader is now ready to read the fuel level of the tank, according to the float gauge.





The installation of the Hall Effect TwinSite™ module into either a four or eight inch Magnetel™ gauge dial face is completed much the same way. You must first remove the metal cover plate over the center of the Magnetel™ gauge face. Align the alignment pin in the Magnetel™ gauge face with the alignment hole in the TwinSite™ module. Insert the module in the gauge face according to this alignment. Replace the metal cover over the TwinSite™ module and secure with the supplied screws.



Caution - For best results the fill level of the tank should be at least 20% full at installation.

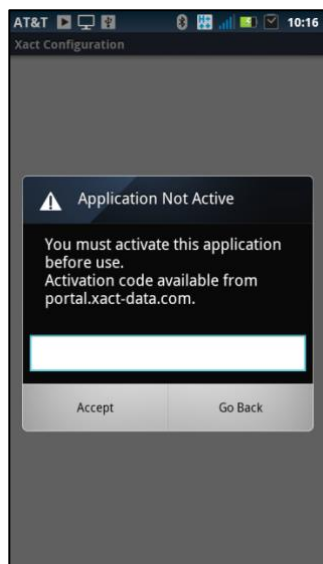
Temporarily place the Xact Satellite box on top of the tank or another flat surface, magnets facing up. Remove the taped plug and set aside for now. Start up your Xact PDA or Android application, and insert the Bluetooth adapter into the 9 pin connector. Connect the battery into its 2 pin locking connector. Both connectors are keyed to prevent accidental misalignment.

System Setup and Calibration

With the Bluetooth and battery connected, refer to the Xact Configurator application or the Xact Setup program on your handheld device to finish the set up and calibration of your Xact System.



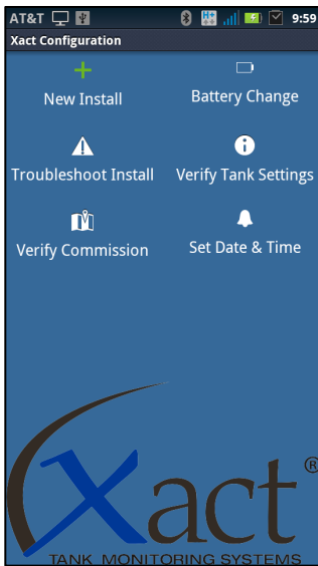
If you receive any error messages after starting the program refer to the troubleshooting section of this manual before continuing. Make sure that all errors have been cleared before continuing with the installation.



Activating your application

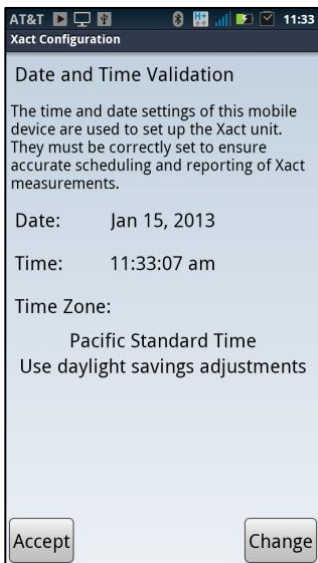
Before you are able to use the Xact application on your Android based device, you must first enter your activation code. If you have not received your activation code please contact your system administrator or your Xact sales representative.

The application will walk you through step by step the entire set up process. Just ensure that you follow all prompts and answer all questions accurately, to set up the Xact System with your particular tank.



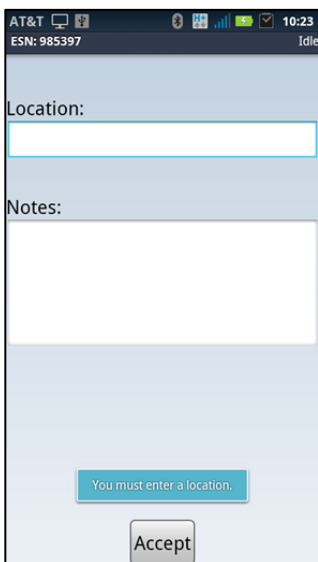
New Installation

To install a new system on your tank, you must first run the Xact application on your Android based device. Once the application is running, connect in your Bluetooth adapter and battery on your Xact unit. When both of these are connected, select **New Install**.



On the first screen you need to confirm that the Time Zone, Time, and Date are correct (select **Accept** or **Change**). The date and time information shown will be used to set the clock in the Xact System, and will become the basis for all subsequent measurement schedules.

If you select **Change**, you will need to input the correct date and time information on your device. When completed, push the **back** button on your device to return to the set up process.



Enter a unique description or identifier for the tank. This can be the location of the tank or some other means of identification. The name should be something that you and others can easily identify when referred to on the website.

To bring up the onscreen keyboard, tap on the open space below location.

A notes field is provided, however these notes are kept locally on your device and will not be uploaded to the website.

Tap the **Accept** button to continue.



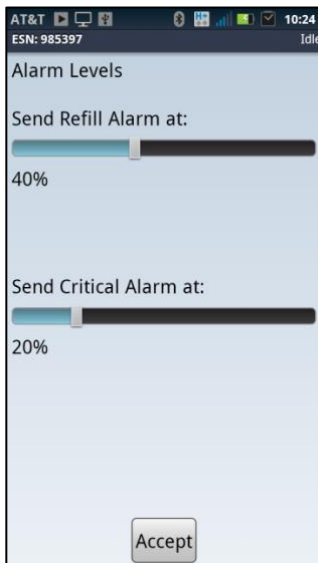
Set Monitoring Mode

A critical step in the set up process is selecting which of the two available monitoring modes is desired for this Xact installation.

Scheduled Monitoring – Measurements are taken and reported on a regular user defined time schedule.

Event Monitoring – Measurements are taken every hour following installation. No reporting of measurements to the website occurs until:

- 1) One of the two Event Alarm fill levels is reached. The Event alarm levels are user defined fill % levels at which a measurement report will be made to the website. Setting these alarm levels is described in the next screen.
- 2) A Refill report occurs whenever a 15% or greater increase in tank fill level is measured, relative to the prior measurement.
- 3) A current fill status report is sent every Sunday afternoon.



Setting Alarm Levels in Event Monitor Mode

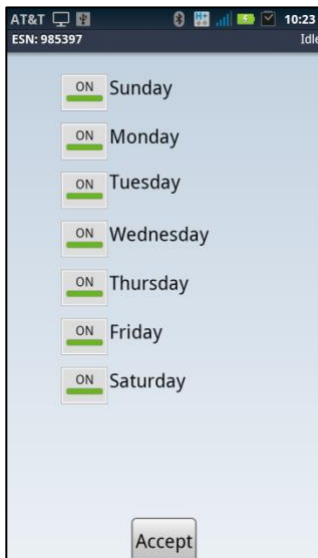
Only active in Event Monitor Mode.

Alarm levels can only be adjusted at the tank. It is imperative that you set these correctly, since revisiting the tank is required to make changes.

Refill Alarm. Refill is the first alarm level you will set. This percentage will be your first notification on the website of tank draw-down.

Critical Alarm. Critical is the second notification of tank draw-down. This alarm report will also be made a second time, 24 hours later, if no Refill event occurs. Set the threshold of this alarm to ensure that you will have plenty of time to get to this tank before it is empty.

Select the correct percentages by sliding the bar, and Tap the **Accept** button to continue.



Setting Measurement Cycles in Scheduled Monitoring Mode

Only active in Scheduled Monitoring Mode.

On the following screens you will setup a schedule that determines how often the Xact Tank Monitoring System will take measurements and report the results.

Be advised that a schedule with higher numbers of measurements will produce higher monthly monitoring costs for the system.

First indicate the day(s) of the week the system should measure and report.

Tap the **Accept** button to continue.

AT&T ESN: 985397 10:25 Idle

<input checked="" type="checkbox"/> Midnight	<input checked="" type="checkbox"/> Noon
<input checked="" type="checkbox"/> 1 AM	<input checked="" type="checkbox"/> 1 PM
<input checked="" type="checkbox"/> 2 AM	<input checked="" type="checkbox"/> 2 PM
<input checked="" type="checkbox"/> 3 AM	<input checked="" type="checkbox"/> 3 PM
<input checked="" type="checkbox"/> 4 AM	<input checked="" type="checkbox"/> 4 PM
<input checked="" type="checkbox"/> 5 AM	<input checked="" type="checkbox"/> 5 PM
<input checked="" type="checkbox"/> 6 AM	<input checked="" type="checkbox"/> 6 PM
<input checked="" type="checkbox"/> 7 AM	<input checked="" type="checkbox"/> 7 PM
<input checked="" type="checkbox"/> 8 AM	<input checked="" type="checkbox"/> 8 PM
<input checked="" type="checkbox"/> 9 AM	<input checked="" type="checkbox"/> 9 PM
<input checked="" type="checkbox"/> 10 AM	<input checked="" type="checkbox"/> 10 PM
<input checked="" type="checkbox"/> 11 AM	<input checked="" type="checkbox"/> 11 PM

Accept

Next select the hour(s) of the day in which you want measurements to be taken. The Xact Gauge Reader System will wake up at a random time during the selected hour(s) to measure and report the fill level of the tank.

For the most accurate measurement results you should select hours that the tank will not be active with filling or dispensing. For example before and after business hours or during any other period of time that is known to be a quiet or inactive period for the tank.

Tap the **Accept** button to continue.

AT&T ESN: 991783 10:24 Idle

Alarm Levels

Send Refill Alarm at:

40%

Gauge Reader

You may enter the total capacity of the tank, or you may enter the dimensions of the tank to calculate the capacity.

Enter Capacity Enter Dimensions

Accept

If you are unsure of the tanks water capacity, you may measure the tank dimensions. Select **Enter Dimensions**.

If you would rather enter the total tank capacity, select **Enter Capacity**.

AT&T ESN: 985397 10:30 Idle

☒ Inches ☐ Centimeters

☒ Circumference ☐ Diameter

35 ft 6 in

When Measured Outside of Tank

Tank Wall Thickness: 1.5 in

Accept

Enter Tank Dimensions

If you chose to enter the tank dimensions, you will enter them here.

Select the **Circumference** radio button and enter the circumference measurement taken earlier.

Wall thickness – From the manufactures name plate, enter the tank wall thickness, unless you entered an inside diameter. If the unit of measure is a fraction, divide the top number by the bottom number to calculate the required decimal equivalent. (e.g. 5/16" = .312")

Most small tanks have a shell thickness of .32".

Tap the **Accept** button to continue.

AT&T 10:30
ESN: 985397 Idle

☒ Inches ☐ Centimeters

Tank Length:

45 ft 6.7 in

Accept

Enter the length of the tank (from weld seam center to weld seam center). The manufacturer's nameplate may give you an overall length. This will include the end walls and therefore should not be used. Ensure that the correct unit of measurement is displayed. Tap the **Accept** button to continue.

AT&T 10:31
ESN: 985397 Idle

Tap End Type:

Elliptical

Hemispherical

Select the type of end cap that matches the tank being installed.

AT&T 9:37
ESN: 991783 Receiving Data from Unit

Tank Capacity:

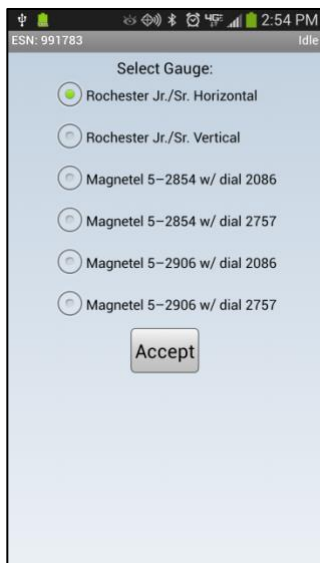
200

☒ Gallons ☐ Liters

Accept

If you chose to enter the tank capacity, enter it here.

Tap the **Accept** button to continue.



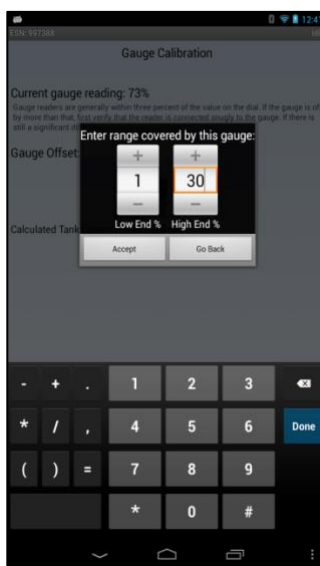
Gauge Face Selection

It is imperative that you choose the correct gauge face and/or dial to ensure that the correct data is transmitted to the website. Xact offers several selections, to include Magnetel™ four and eight inch dial faces.

Tap the **Accept** button to continue.

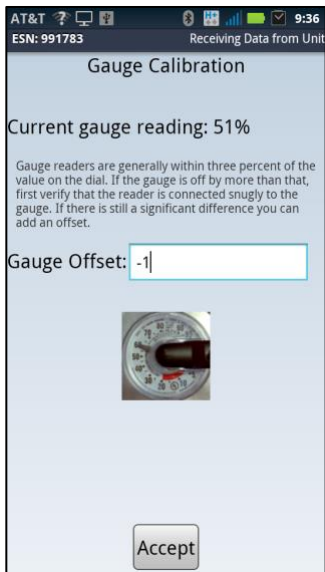


If you selected the Vertical gauge, you will need to verify if the gauge is reading the whole tank or just a part of it.



If only part of the tank is measured by this gauge, enter the low end and high end readings for this gauge.

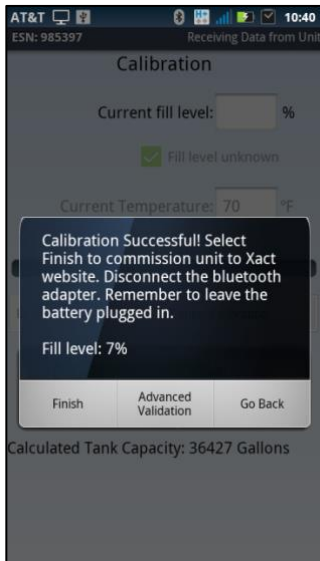
Tap the **Accept** button to continue.



Calibration

At this time the Xact system will automatically read the tank level according to the gauge face. Visually verify the reading with the float gauge. If there is a difference greater than 3 percent, ensure that the gauge reader sensor is fully engaged and also ensure that the correct gauge type is selected and re-run the calibration.

Tap the **Accept** button to continue.



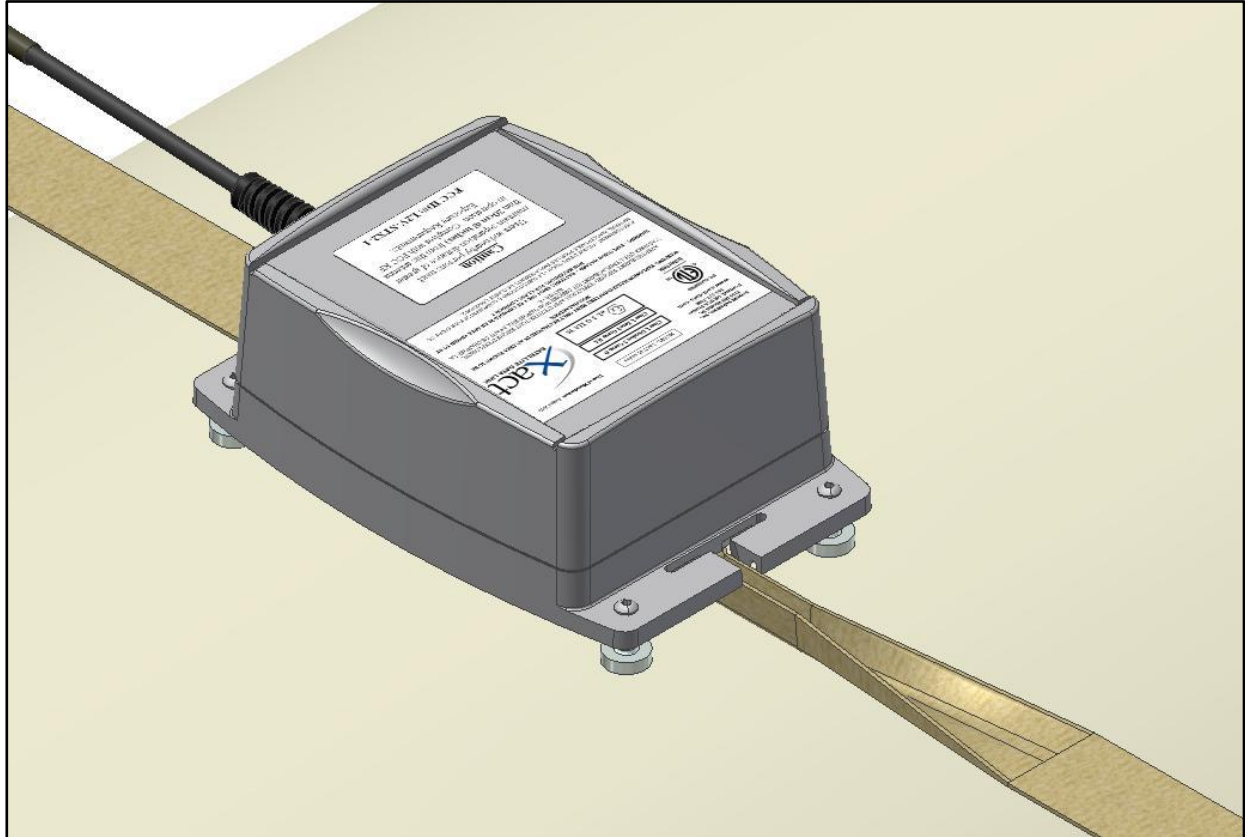
Upon a successful calibration, select **Finish**. The Xact Gauge Reader System will now establish communications with the satellite system and transfer the information to the web site. This process can take up to 45 minutes, depending on satellite location. **DO NOT UNPLUG THE BATTERY.** Remove the Bluetooth adapter, retrieve the 2" plug that you set aside earlier, and firmly insert it into the hole in the bottom plate of the Satellite Box. Ensure this is completely seated and flip the box right side up.

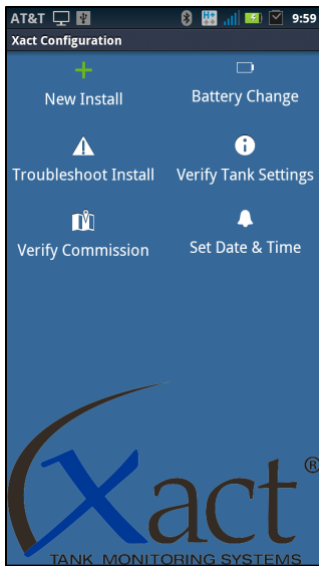
While the system is completing the process of sending setup information, you should immediately proceed to finish the installation of the hardware.

Final Hardware Installation

With the Satellite box right side up, move it until it lays directly over the strap. Loosen the strap so that you have enough slack to route it through the slots on the bottom plate of the box. Pinch the strap into a “V” shape facing up. Slip the open part of the “V” through the slot in the plate. Once through, open it until it lays flat. Repeat this process on the other side.

Ensure that the location of the Satellite box will not interfere with the lid covering the valve assembly. Once the satellite box and strap are in place, cinch the strap down snugly.





Changing The Battery

To change the battery, loosen the strap so there is enough slack to remove it from the slots in the Satellite box. Flip the Satellite box upside down to expose the four screws in the bottom plate and remove them. Remove the lid to expose the battery. Remove the 2 inch plug in the bottom plate, unplug the battery, loosen the velcro strap, and remove the battery. Place the new battery in the correct location, tighten the velcro strap around it, route the battery connector to the opening from the plug, replace the bottom plate and secure it onto the housing with the four screws. Do not over tighten these screws. Plug in the new battery and your Bluetooth adapter. From the application menu, select **Battery Change**. **Accept** the correct time zone, time, and date, tap the **Finish** radio button. You will be prompted after the Xact System has updated the time. Select **Finish** when complete.

Troubleshooting

In the event the Xact calibration process produces a result that is greater than a 3 percent difference from your visual reading, try the following steps and then re-calibrate the unit.

1. Verify that the Gauge face you selected is correct.
2. Remove the Hall Effect Module from the gauge face, remove the gauge face and ensure the needle is freely moving. Re-install the gauge face and Hall Effect Module.
3. If the calibration result is again **unsuccessful**, it may be necessary to add a gauge offset.

During the installation process you might encounter various “Error” notices in the application software. These notices generally deal with low power issues, or disconnected wires. Follow the prompts to resolve problems. Adherence to these suggestions will help achieve a successful installation.

System Wiring Schematic

FOR USE IN CLASS 1 DIVISION 2 GROUP D HAZARDOUS LOCATIONS, AND CLASS 1 ZONE 2 GROUP IIA

