Crystal Ball Kit
Lift Station Monitoring

Guide to Empower
Facilities Monitoring & Analyzing

Scan here for
Virtual Manual

OmniSite

Crystal Ball Kit
Comprehensive User Guide

Welcome To OmniSite!

The Future of SCADA

OmniSite cares about the environment. There are tens of thousands of OmniSite monitors across the USA monitoring critical pump stations, giving you early warning, so you can prevent environmental spills.

OmniSite is fast and easy to use. **OmniSite is "the new way to do SCADA"**. Do our products report sensor data by the millisecond? NO. However, we offer instant alarm notifications, and analog values can be reported at 5 or 15 minute intervals based on the report package you selected. This solution is definitely "quick enough" to keep you "in the clean" and saves you a lot of time and money.

Don't be fooled by old school SCADA providers who sell tremendously expensive, slow, complex solutions. Look at the below picture, and honestly ask yourself "Do we have anyone on staff who can work on that?" If your answer is "no" then OmniSite is for you!

Using cellular airwaves and the Internet, OmniSite delivers services using a refined solution. This saves you money and time in the long run. The solution is also straightforward, allowing your multi-tasking personnel to seamlessly alternate between mundane tasks and utilizing OmniSite's services. OmniSite can be used without prior expertise in telemetry, programming, and controls, allowing you to focus on what matters most to you: operating your facility.

OmniSite is a cloud-based solution, so there is no software to buy or install. Our software platform, called GuardDog, includes iPhone and Android apps at no additional cost. Any phone, tablet, or PC that can browse the web can use GaurdDog. Receive flexible notifications via email, text, or voice call using our easy configuration system. Have extensive history on your pumps and equipment without creating laborious SCADA graphic screens. OmniSite does all this out-of-the-box.

Attention Installer!!

It is mandatory that you connect ALL THE WIRES, PUMP AMP PROBES, AND WELL LEVEL TRANSMITTER as described on the following pages!!

This Crystal Ball cellular and cloud based monitor/analyzer/controller is ALMOST LIKE MAGIC, but it's definitely not 100% magic

This device cannot deliver ANY of the following advanced reports, if YOU don't connect the needed wires as shown on the following pages

Why Proper Installation Matters
Cutting corners during installation—especially by skipping steps outlined in this manual—can result in your customer not receiving the full functionality they were promised, including important reports highlighted in both the product literature and sales process. When expectations aren't met, customers lose trust and often choose not to work with you again.

Why Do Omnisite Monitors Sometimes Get Improperly Wired?
Improper wiring is often the result of underestimating the time needed for correct installation, configuration, testing, and customer training. Taking shortcuts may seem time-efficient in the moment, but it can lead to major issues down the line—ones that impact both the installer's credibility and customer satisfaction.

To ensure a successful experience for everyone, **it's essential to connect, at minimum, the wires and devices specified in this manual.** Additional inputs are available to support even more features, should your customer require them. Taking the time to do it right the first time will pay off in long-term reliability and customer loyalty.

INCLUDED REPORTS
Pump 1 amp history
Pump 1 cycles history
Pump 1 runtime history
Pump 1 GPM history
Pump 1 on/off status history
Pump 1 failure history
Pump 2 amp history
Pump 2 cycles history
Pump 2 runtime history
Pump 2 GPM history
Pump 2 on/off status history
Pump 2 failure history
Pump 3 amp history
Pump 3 cycles history
Pump 3 runtime history
Pump 3 GPM history
Pump 3 on/off status history
Pump 3 failure history
Total station daily flow history
Well inflow rate history & level
Rainfall history
Daily Radar Rainflow
User Audit Trail history
Notification History
Alarm History
Email,Text,Voice Notifications

ADVANCED REPORTS
Database Backups
Cybersecurity Protection
24/7 Tech Support
Warranty
Time/Day call plan scheduler
Volumetric Flow Calculations
Counters
Pump Control
Local Display Interface
Smart Access Key

NOTICE

INSPECT CONTENTS IMMEDIATLEY
AND FILE CLAIM WITH DELIVERING
CARRIER FOR ANY DAMAGE

SAVE THE BOX
AND
PACKING MATERIAL

YOU ARE RESPONSIBLE FOR DAMAGE TO YOUR
UNIT IF RETURNED IMPROPERLY PACKED

WARNING: The individual user should take care to determine prior to use whether this device is suitable, adequate or safe for the use intended. Since individual applications are subject to great variation, the manufacturer makes no representation or warranty as to suitability or fitness of these devices for any specific application.

General Safety Instructions
Safety Signal Words

Danger: means if the safety information is not followed, someone will be seriously injured or killed.

Warning: means if the safety information is not followed, someone could be seriously injured or killed.

Caution: means if the safety information is not followed, someone may be seriously injured or killed.

1. To reduce the risk of fire or shock hazard, connect OmniSite RTU directly to a 120 VAC electrical circuit. Do not use extension cords for permanent installation.

2. Cover of OmniSite RTU must be securely closed to prevent water damage and electrical shock.

3. Never operate your OmniSite RTU while any part is missing or damaged in any manner.

4. To reduce the risk of electrical hazard or damage, do not tilt, jolt or tip RTU while unit is powered-on.

5. To reduce the risk of accidental electrical shock, do not touch the electrical terminals or controls with wet hands.

6. Note the warning label shown below.

WARNING: To reduce risk of fire, electric shock, or injuries always disconnect all sources of electrical power before servicing or cleaning.

INTRODUCTION

Congratulations - you just bought the best. The OmniSite system provides two-way communications using our patented WINGS™ (Wireless IOT Network Gateway Server) over a cellular network. The low cost of the OmniSite method makes remote monitoring very affordable and allows our devices to operate on cellular networks across the USA. We have the most complete coverage and best reputation in the industry.

OmniSite wireless monitoring devices provide a low-cost wireless system for remote monitoring, measurement, and data collection anywhere wherever there is cellular service.

Overview

The OmniSite Crystal Ball is a multi-channel monitoring and control device that has been optimized for use by the water and wastewater utilities. It is designed for indoor or outdoor environments, and operates from 120VAC or +15-20 VDC solar panels and power supplies. The module's internal cellular modem module provides two-way communications through the fully automated OmniSite operations center to the www.OmniSite.com web site.

The standard operating program of the RTU monitors all (14) digital inputs and the alarm limits on (4) analog inputs and reports any changes. This information is immediately displayed on the web site, and user selectable alarm notifications for critical events can be sent via text, e-mail, telephone call or any combination thereof. Equipment status reports can be scheduled in advance or requested at any time. In addition, the Crystal Ball is a sophisticated pump controller.

Installation and Operation is Very Simple:

Please note that your OmniSite product is a cellular device. No matter how good the installation looks, without cellular reception, your device will not work!
Therefore, your first step is to determine whether suitable cellular service is available at the installation location BEFORE you start your actual installation. Connect your OmniSite unit to a temporary extension cord, and plug it in at the installation location.
Look at the cellular signal strength LED on the Crystal Ball. If it is GREEN, you have a good signal and can proceed with installation. If NOT GREEN, call OmniSite at 317-885-6330 to determine that your cellular signal strength is suitable. Once this is verified you can move-on to installing your equipment with confidence.

Observe good wiring practices - DO NOT MIX high and low voltage wiring inside your pump control panel. This creates a situation where high voltage cables can "induce" false signals onto your low voltage OmniSite inputs.
OmniSite low voltage cables should be routed inside low voltage wiring duct in your existing control panels. If you are not sure if high & low voltages are mixed inside your panel, you can always "tie-wrap" your OmniSite sensor wires to the outside of the wiring duct. This technique still provides an attractive installation while providing suitable separation from high voltages.

CAUTION - If you mount your OmniSite RTU inside of your existing electrical cabinet, then take extra care to **ensure that the antenna coaxial cable is NOT routed with high voltage cables or alarm horn power wires**. This can lead to unpredictable cellular reception or damage to the radio circuitry.

OmniSite RTU's can be mounted indoors or outdoors
OmniSite's cellular devices can be mounted directly outdoors (if you purchased the NEMA 4X polycarbonate enclosure option), or inside of your existing electrical control panel if room allows. A common installation technique is to mount the RTU inside the existing electric control panel you are monitoring; mount our "Phantom" antenna on top of your existing panel; then connect the antenna to the RTU using an OmniSite supplied coax jumper cable. Note that your antenna must be mounted outside of any metal electrical enclosure.

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Available In Virtual Manual

TECHNICAL SUPPORT

Have questions or comments about your Crystal Ball Kit? Please contact:

203 W. Morris Street
Indianapolis, IN 46225
support@OmniSite.com
317-885-6330 x3

FREE WORLD-CLASS SUPPORT!
www.OmniSite.com

TECHNICAL SPECIFICATIONS

OmniSite Crystal Ball

I/0:	Accepts (14) Universal Digital Inputs- any voltage in the range of+ 12VDC or VAC to+ 120VDC or VAC. Opto-isolated 4000 VAC isolation | (4) 20A form C relay outputs | (4) 4-20mA analog inputs. Analog input-1 includes 4000V opto-isolation | (3) Pulse Inputs: 0-30hz from dry contact or open collector device (1 pulse input reserved for 0.01” pulsing rain gauge)
Input Power:	80-260 VAC @ 0.5A max or optional 15 VDC @2A max
Terminal Blocks:	Gray color, removable style, spring-clamp accepts #14-22 AWG solid or stranded wire
External Power Source:	12 VDC@ 100mA battery backed internal power source available for powering external un-powered alarm contacts, and non-battery-backed for powering 4-20mA loop powered devices.
SD Memory Card Slot:	On-board SD memory card slot for data logging and software updates
Battery Backup:	Internal 12 VDC, rechargeable 800mA/hr sealed lead acid battery rated for 4 hours backup during AC power loss
Operating Temperature:	-20 - 150 °F
Operating Humidity:	0-90% RH, non-condensing
Cellular Radio:	4G/LTE CAT-1
Antenna:	Multiband LTE Antenna, optional remote mount high gain antennas and cables available
Display:	4 line X 20 Char white background LCD w/ backlight. Includes “easy-use” navigation buttons
Personal ID Key Reader:	Smart key reader to identify maintenance personnel. (1) smart key included
Enclosure:	Standard unit is hinged painted steel design w/ remote mount keypad suitable for direct panel mount. Optional NEMA 4X polycarbonate enclosure w/ stainless locking hasps and solid or clear cover available. Larger Enclosure will also be available.
Dimensions:	panel mount - 8.5”W x 8.2”H x 3.5”D - with optional NEMA 4X enclosure - 12”H x 10”W x 4” D
Weight:	Weight: Standard panel mount - 7.0 lbs , with NEMA 4X enclosure - 7.5 lbs.
Protection:	Protection: US Patent #7,228,129

TECHNICAL SPECIFICATIONS CONTINUED

Submersible Level Transducer

Measurement Range:	0-20 ft.
Accuracy:	0.5%/0.2% F.S (including linearity, repeatability, and hysteresis)
Long Term Stability:	± 0.2 % F.S. per year
Output Signal:	4mA to 20 mA (two-wire type)
Power Supply:	12 VDC - 24 VDC ± 10%
Response Time:	10ms
Allowed Overpressure	2.5 times full scale
Compensated Temperature:	from -10°C to +60°C
Load Impedance:	50K Ω min. for < 0.1% FSO attenuation
Input Current:	8mA nominal
Insulation Resistance:	10M Ω @ 50 VDC and +70 degrees F
Connection:	60 ft of 3-conductor #20g Hytrel jacketed Cable with breather tube utilizing Teflon hydrophobic filter. Optional 100ft can be purchased.
Weight:	5 lbs.
Materials:	All 316 stainless steel exterior body and diaphragm
Operating Temperature:	32 Degrees F - 150 Degrees F
Thermal Drift:	+/- 2.0% FS 50/100 Degrees F

Amp Probes

Model :	MI-420MAP
Amperage Rating:	0-100, 0-150, 0-200 Amps, user selectable jumper
Sensor Output:	4 to 20 mA Accuracy +/-0.5% FS
Supply Voltage:	12-40 VDC Loop Powered
Isolation:	1270 VAC

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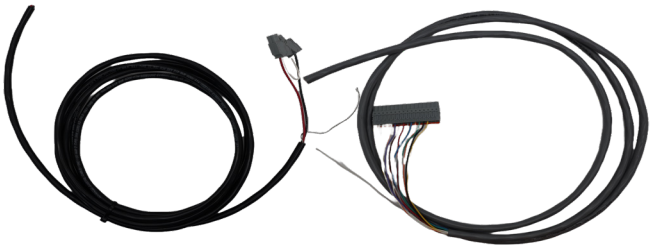
Included Components:

- **(1) Crystal Ball in NEMA 4X Enclosure with (4) 3/4"• sealtite connectors**
- **(1) 10' Digital Input Cable 600VAC**
- **(3) 10' Analog Input Cable 600VAC**
- **(1) 10' 14/3 Power Cable 600VAC**
- **(2) 4-20mA Amp Probe Additional Optional Additional Amp Probe**
- **(1) 0-20' Submersible Level Transducer or radar sensor**
- **(2) Pre-landed terminal block sets for digital and analog input**
- **(1) Pre-landed terminal for power**
- **8 ft of 3/4" sealtite plastic conduit**
- **(1) Accessory bag**



Digital and Analog input cables

Amp Probe

Radar Sensor

Sealtite Connectors

Pre-landed Terminal for Power

Accessory Bag

Sealtite Plastic Conduit

Submersible Level Transducer

ACTIVATION STEP #1

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STEP #1

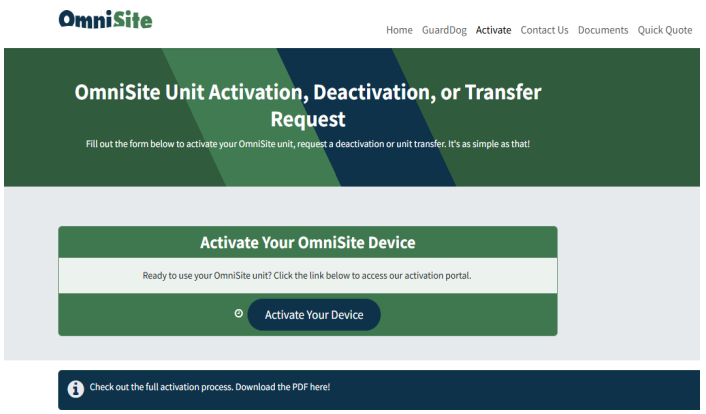
1.0 ACTIVATION

The Crystal Ball is a cellular device just like your cell phone. As such, all OmniSite devices require activation before will transmit alarms.

Note: Activation should be done before installation, login also requires Primary User GuardDog credentials

Please follow the instructions below to activate your device.

1.1. Navigate to www.OmniSite.com/activate to launch the Activation Wizard.

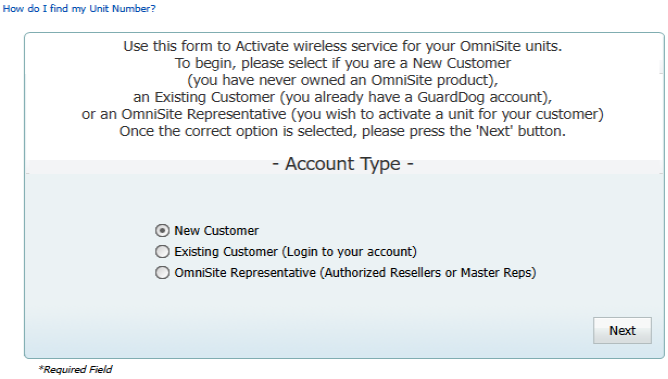


1.2. Select an appropriate account type

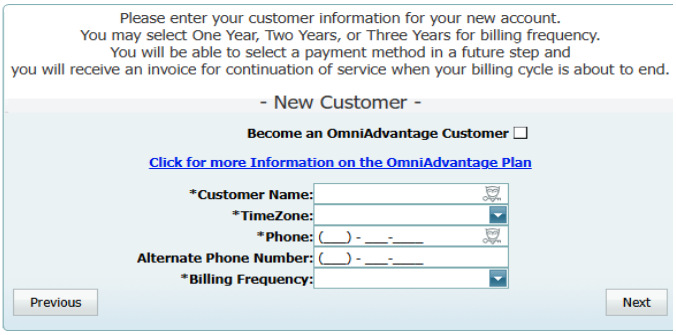
- If you are a new customer, select "New Customer" to create a new account

- If you are an existing customer, select "Existing Customer" to log into your account. Select activiation and skip to 1.6.

- If you are an OmniSite representative, select "OmniSite Representative" to log into your account



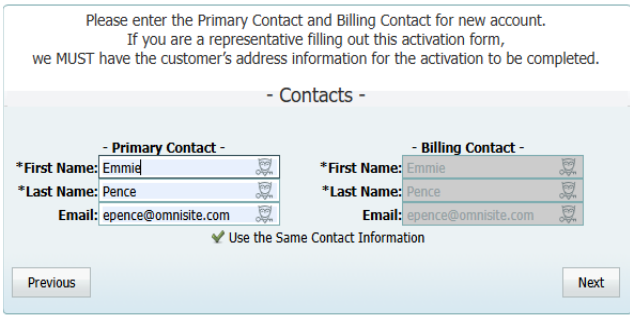
1.3. All wireless billing is billed annually. You can choose the billing frequency for pre-paying for one, two, or three years. (The longer terms cost less per year)



1.4. Billing Contact: This area is for ***customer contact*** information only. If representative is filling out activation for customer, do not enter representative name.

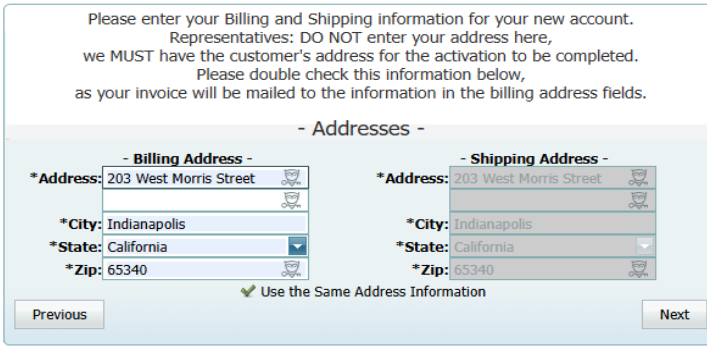
Check Box: Check here if Primary Contact and Billing Contact are the same

Note: If customer information is not provided, this can put their account at risk when the billing period ends.

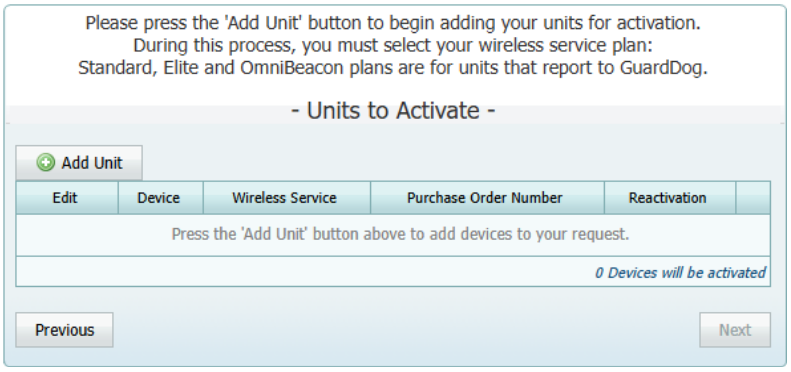


1.5. Address: Addresses should be customer Main & Shipping addresses. Do not enter rep contact info, even if rep is paying for first year of service.

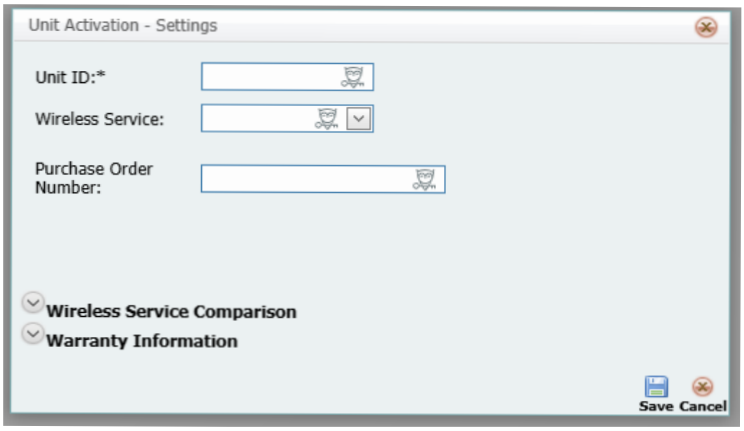
Check Box: Check here if Main Address & Shipping Address are the same.



1.6. Multiple Units: Multiple units can be activated at the same time.



1.7. UNIT ID: Locate your unit's ID number and insert here. (The sticker is located on top of the Crystal Ball's painted black metalwork.)

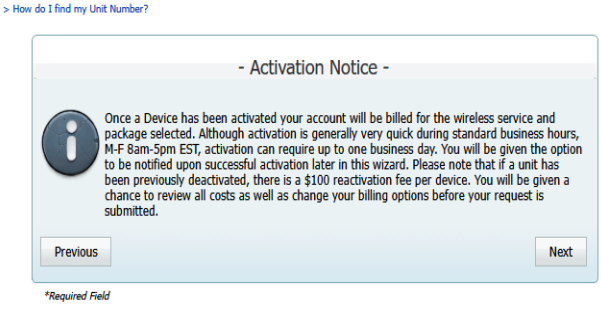


CELL SERVICE:
Basic Service: Device reports a summary once every 24 hours and alarms immediately.
Elite Service: Device submits a selected report every 15 minutes, plus a daily report summary and immediate alarm notifications.
Real time: Real Time Alarms, Real Time Pump Data, Peer to Peer Pump Control Capability, and Realtime Reporting

PO: Place your purchase order number for service here. If you pre purchased wireless service this box will autopopulate

Note: If a cellular PO/Key was not purchased along with your unit you may enter "Verbal, <Customer name>".

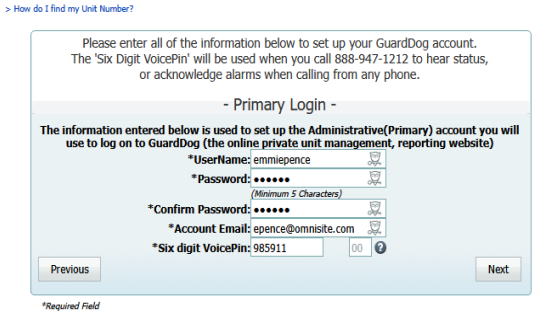
1.8. Activation: Activations can take up to one full business day after submission. We suggest activating units 1-2 days before installation.



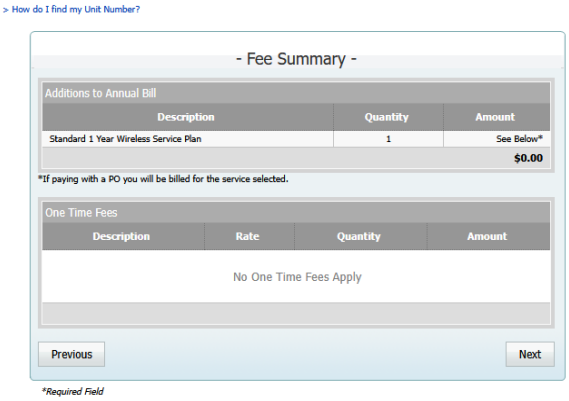
1.9. UserName: Can be any length and be numeric or alphabetic.

Password: Must be a minimum of 5 characters, 1 special character and 1 number

Voice Pin: Must be 6 digits. Many customers use the first 6 digits of their phone number

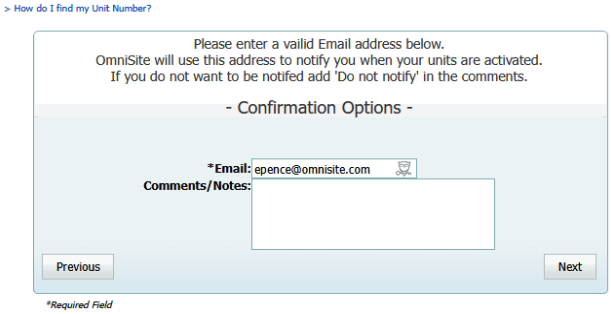


1.10. Fees: All recurring subscription fees associated with the activation are noted here. You will be invoiced for the correct amount once submitted. IF you are reactivating a unit you will see it under the one time fee box.



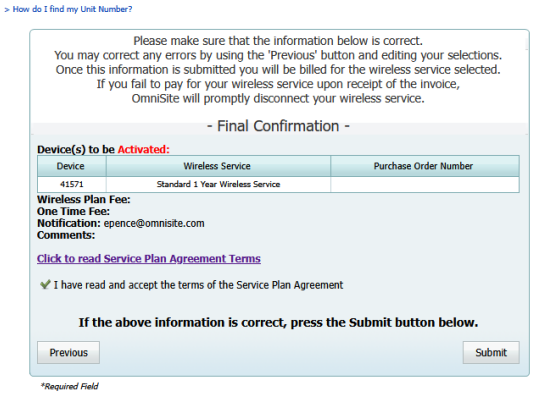
1.11. Email: This is how we will notify you once the activation is complete.

Comments/Notes: Note any special circumstances regarding this activation here. (e.g. Unit is replacing another unit that is being deactivated.)



1.12. Check box: Check this after reading and agreeing to the Service Plan Agreement Terms.

Submit Button: Once you have verified that all information is correct and checked the box, click the submit button.



Success!

Your unit(s) should be activated within one business day. Any changes to information noted in this activation wizard should be communicated to the OmniSite technical support team immediately to ensure accurate service and billing.

MANDATORY MOUNTING STEP #2

Attention Installer!!

It is mandatory that you connect ALL THE WIRES, PUMP AMP PROBES, AND WELL LEVEL TRANSMITTER as described on the following pages!!

This Crystal Ball cellular and cloud based monitor/analyzer/controller is ALMOST LIKE MAGIC, but it's definitely not 100% magic

This device cannot deliver ANY of the following advanced reports, if YOU don't connect the needed wires as shown on the following pages

WHAT HAPPENS WHEN YOU TRY TO SAVE MONEY ON YOUR INSTALLATION TIME AND NOT WIRE AS SHOWN IN THIS MANUAL? - Your customer will not get the reports they were promised in the product literature, plus promised by the salesman who sold this device. When your customer does not get what they paid for, they become unhappy, and in the future, they are no longer your customer! Cutting corners simply creates your next ex-customer!

WHY OMNISITE MONITORS DON'T GET WIRED PROPERLY?
It's because the salesperson or the service installer
Estimates far too little time to correctly install, setup, and test their product. You also need to give your customer training. Don't make this mistake, plus don't cut corners and try to save installation time. This will haunt YOU LATER! **Do the right thing AND CONNECT AT AN ABSOLUTE MINIMUM THE WIRES AND DEVICES SHOWN IN THIS MANUAL. There are many spare inputs to connect more.**

INCLUDED REPORTS

- Pump 1 amp history
- Pump 1 cycles history
- Pump 1 runtime history
- Pump 1 GPM history
- Pump 1 on/off status history
- Pump 1 failure history
- Pump 2 amp history
- Pump 2 cycles history
- Pump 2 runtime history
- Pump 2 GPM history
- Pump 2 on/off status history
- Pump 2 failure history
- Pump 3 amp history
- Pump 3 cycles history
- Pump 3 runtime history
- Pump 3 GPM history
- Pump 3 on/off status history
- Pump 3 failure history
- Total station daily flow history
- Well inflow rate history & level
- Rainfall history
- Daily Radar Rainflow
- User Audit Trail history
- Notification History
- Alarm History
- Email,Text,Voice Notifications

ADVANCED REPORTS

- Database Backups
- Cybersecurity Protection
- 24/7 Tech Support
- Warranty
- Time/Day call plan scheduler
- Volumetric Flow Calculations
- Counters
- Pump Control
- Local Display Interface
- Smart Access Key

STEP #2

2.0 MOUNTING & WIRING YOUR CRYSTAL BALL KIT- STEP 2

OmniSite's cellular devices can be mounted directly outdoors (if you purchased the NEMA 4X polycarbonate enclosure option), or inside of your existing electrical control panel if room allows. A common installation technique is to mount the RTU inside the existing electric control panel you are monitoring; mount our "Phantom" antenna on top of your existing panel; then connect the antenna to the RTU using an OmniSite supplied coax jumper cable. Note that your antenna must be mounted outside of any metal electrical enclosure.

CAUTION - If you mount your OmniSite RTU inside of your existing electrical cabinet, then take extra care to ensure that the antenna coaxial cable is NOT routed with high voltage cables or alarm horn power wires. This can lead to unpredictable cellular reception or damage to the radio circuitry.

MANDATORY WIRING STEP #3

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STEP# 3

3.0 WIRING

All the wires are already connected to the Crytsal Ball field terminal blocks. Please see the wiring legend below for the bottom terminal. The top has been pre-wired with the white jumper and one white wire that connects to the neutral.

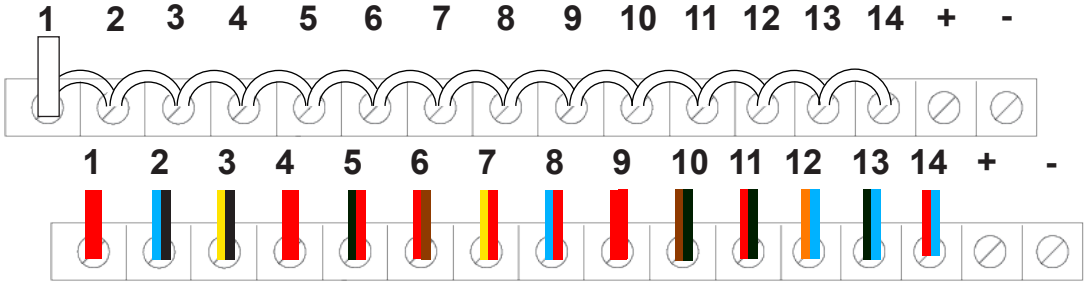
Digital Inputs

INPUT NUMBER	DESCRIPTION	WIRE COLOR
Input 1	High Wet Well Level	Red Wire (Mandatory connection)
Input 2	Pump 1 Overload	Blue/Black Wire (Optional connection)
Input 3	Pump 2 Overload	Yellow/Black Wire (Optional connection)
Input 4	Phase Failure	Orange Wire (optional, may not be in all panels)
Input 5	Low Wet Well Level	Black/Red Wire (Optional connection)
Input 6	Low Bioxide Level	Brown/Red Wire (optional, may not be in all panels)
Input 7	Spare Input	Yellow/Red Wire
Input 8	Pump 1 Seal Failure	Blue/Red Wire (optional, may not be in all panels)
Input 9	Pump 2 Seal Failure	Orange/Red Wire (optional, may not be in all panels)
Input 10	Tamper Switch	Brown/Black Wire (optional, may not be in all panels)
Input 11	Spare input	Red/Black Wire

NOTE: Do not mix AC and DC return wiring, this will cause erroneous operation or damaged inputs, potentially voiding the warranty. Keep specific voltage returns separated!

Any signal 12 VAC/VDC to 120 VAC/VDC. No polarity required. Typical for all digital inputs.

NOTE: Different voltages can be applied to different input channels as needed (i.e. don't all have to be the same)



Runtime Inputs

INPUT NUMBER	DESCRIPTION	WIRE COLOR	
Input 12	Pump 1 Runtime	Orange/Blue Wire	(Mandatory Connection)
Input 13	Pump 2 Runtime	Black/Blue Wire	(Mandatory Connection)
Input 14	Pump 3 Runtime	Red/Blue Wire	(Mandatory Connection)

Analog Inputs

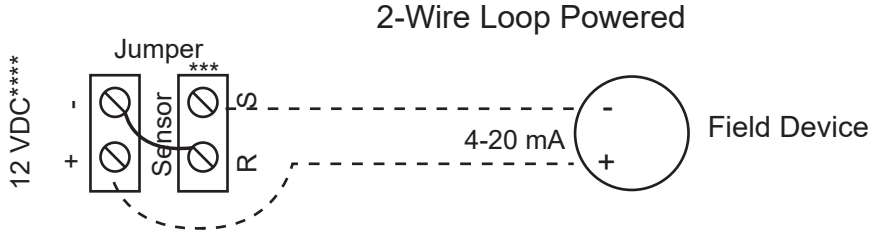
INPUT NUMBER	DESCRIPTION	WIRE NUMBER*	
Input 1*	I-Level (Well Level)	Analog Wire 1**	(Mandatory Connection)
Input 2	Pump 1 Amps	Analog Wire 2	(Mandatory Connection)
Input 3	Pump 2 Amps	Analog Wire 3	(Mandatory Connection)
Input 4	Spare	Analog Wire 4	(Optional Connection)

*NOTE: We've pre-connected an Analog black/white wire pair to all three analog inputs as shown below. The white wire on the analog pairs are numbered in accordance to the diagram above.

** Analog Input 1 is not pre-wired since it receives the rigid cable from the I-Level Probe. This will be shown later in this manual.

*** Crystal Ball Analog Input Impedance = 250 ohms

****12VDC @ 80 mA max, each input



Wiring Diagram

Use the following images to wire up the

- High Wet Well Level,
- Pump 1 & 2 Overload,
- Pump 1-3 Runtimes,
- The I-Level (Submersible Well Level Transducer),
- Pump 1 & 2 Amps Probes in your panel.

Fig. 1: Complete Wiring Diagram

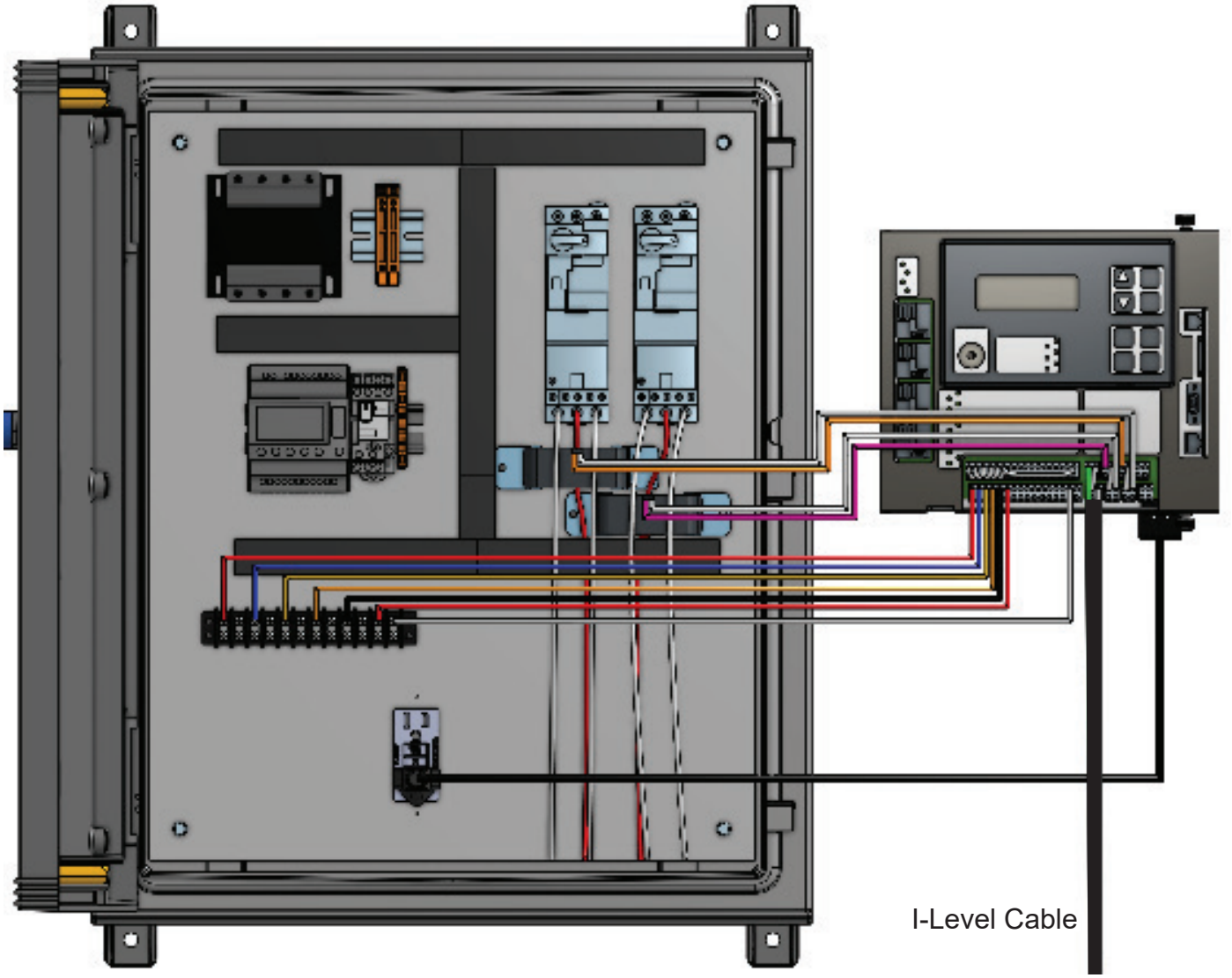
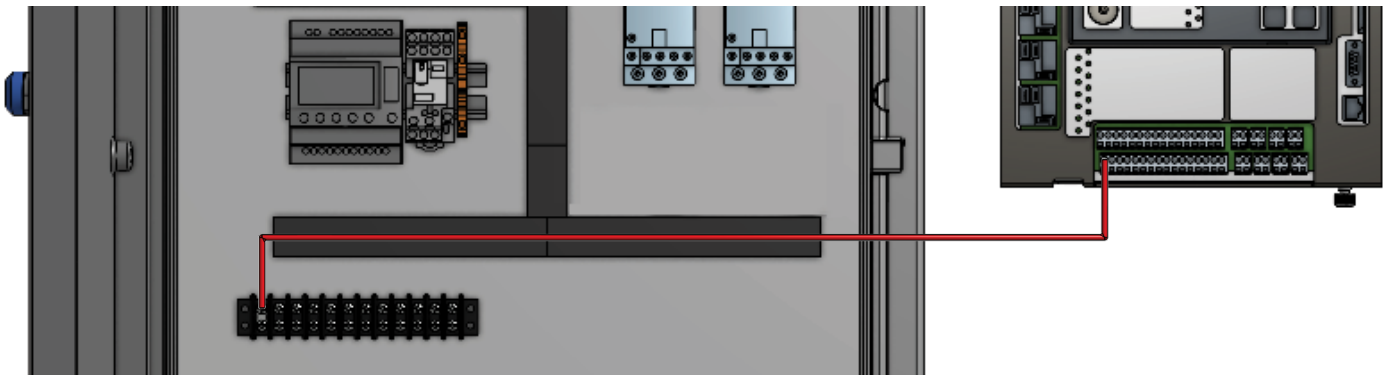
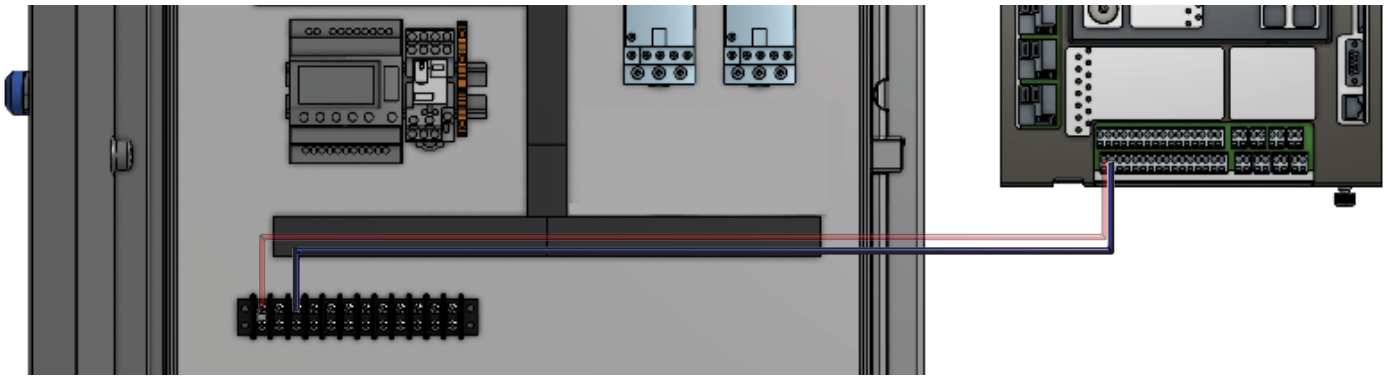


Fig. 2: Wiring High Wet Well Level



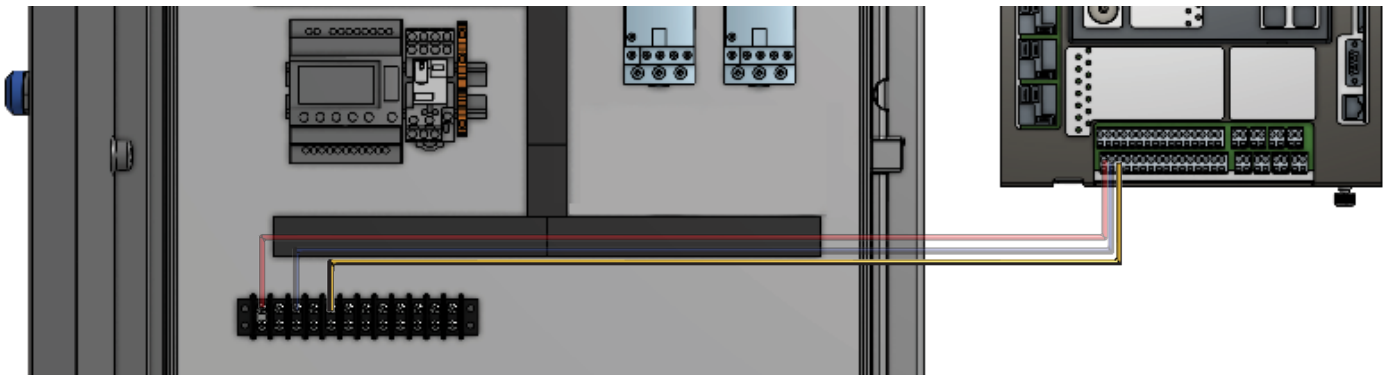
Wire Input 1 on the Crystal Ball to the terminal strip in the electrical box using the red wire. This wire should land on the “switched side” of the high-level float such that 120 V power is supplied to the Crystal Ball when the high float tilts up, indicating high level alarm.

Fig. 3: Wiring Pump 1 Overload



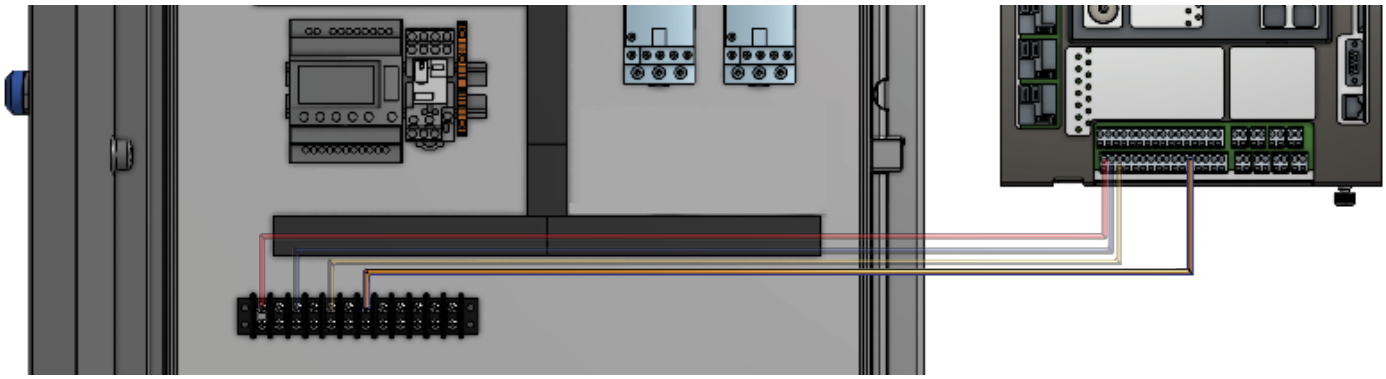
Wire Input 2 on the Crystal Ball to the terminal strip in the electrical box using the blue/black wire. This wire should land on the “hot side” of the overload contacts such that when the overload trips, voltage is applied to the Crystal Ball. When overload is not tripped, voltage is NOT supplied to Crystal Ball.

Fig. 4: Wiring Pump 2 Overload



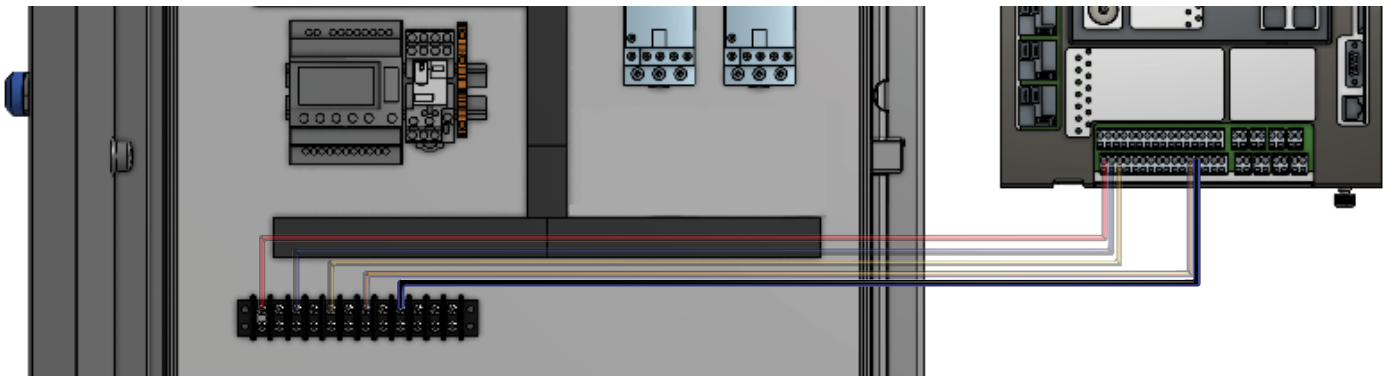
Wire Input 3 on the Crystal Ball to the terminal strip in the electrical box using the yellow/black wire. Wire pump #2 overload identically to pump #1 overload (as shown in Fig. 3.)

Fig. 5: Pump 1 Runtime



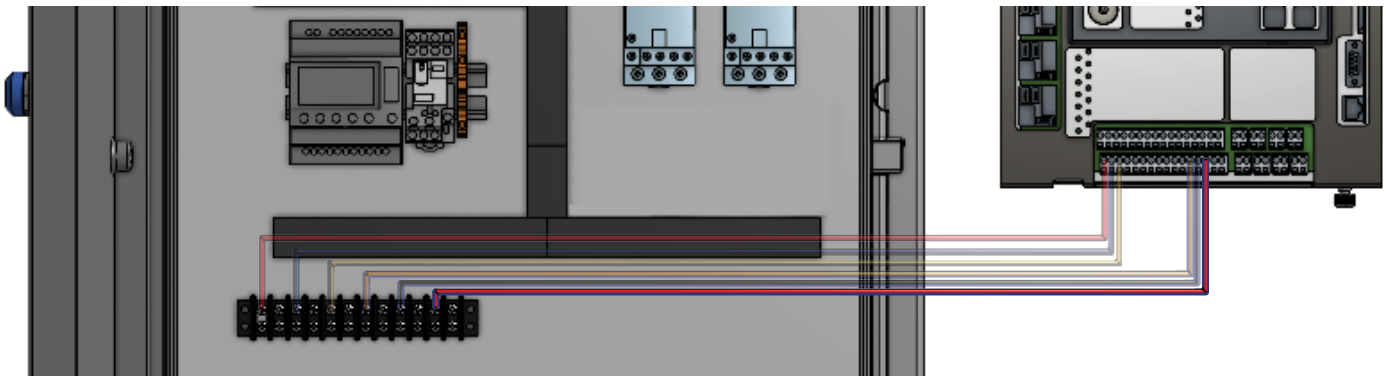
Wire Input 12 on the Crystal Ball to the terminal strip in the electrical box using the orange/blue wire. This wire should land on hot side of the motor starter coil, or run light, such that voltage is applied to Crystal Ball when motor starter is energized.

Fig. 6: Pump 2 Runtime



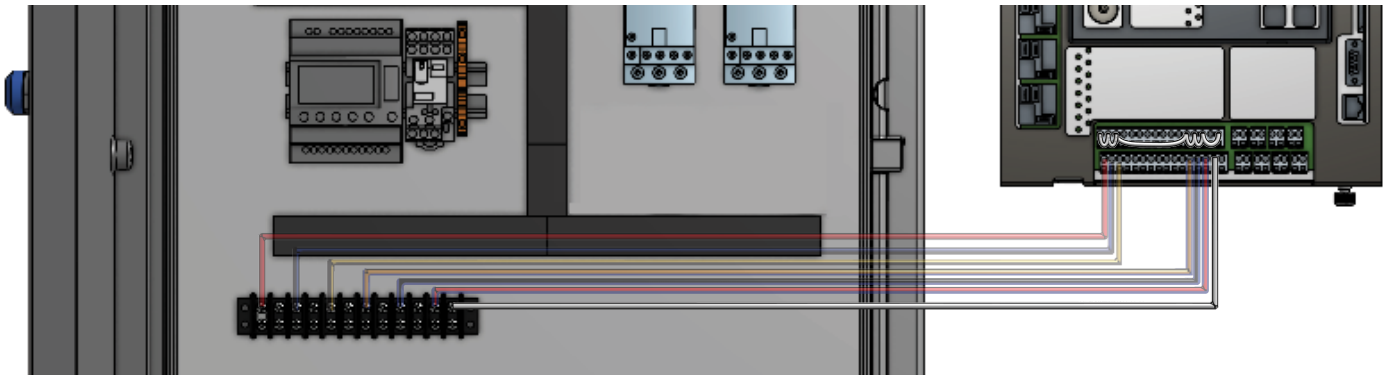
Wire Input 13 on the Crystal Ball to the terminal strip in the electrical box using the black/blue wire. Wire identically to Pump 1 runtime (as shown in Fig. 5)

Fig. 7: Pump 3 Runtime



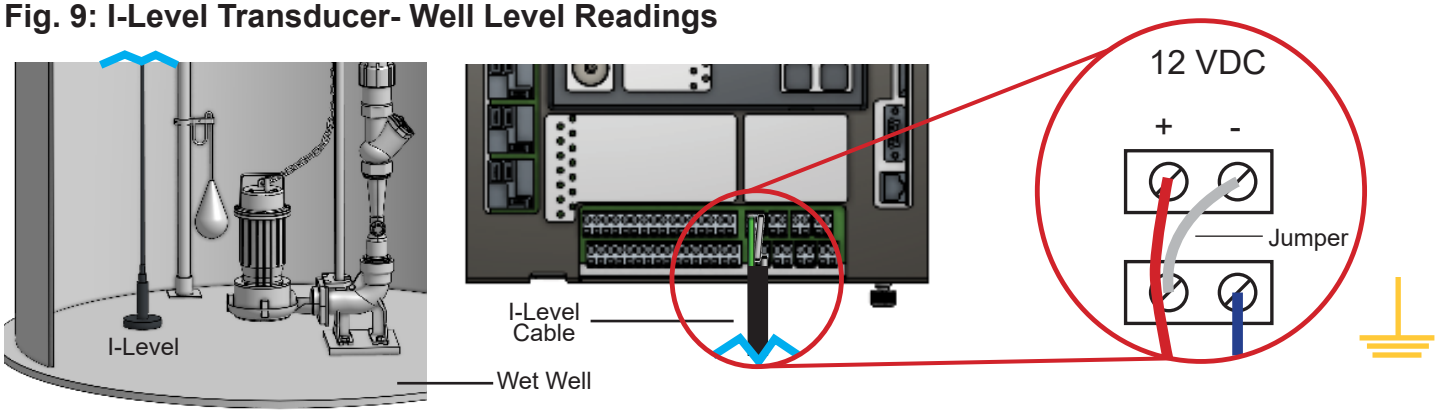
Wire Input 14 on the Crystal Ball to the terminal strip in the electrical box using the red/blue wire. Wire identically to Pump 1 runtime if Pump 3 exists (as shown in Fig. 5)

Fig. 8: Terminal Strip for Digital Inputs Neutral Wire



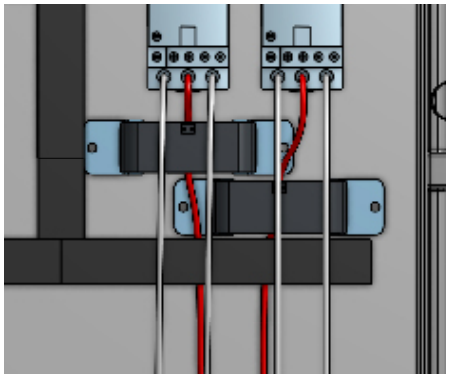
Wire the neutral wire to the terminal strip in the electrical box using the white wire. This wire should connect to the 120 VAC neutral in the pump control panel and is jumpered at the Crystal Ball to all digital inputs for your neutral voltage reference.

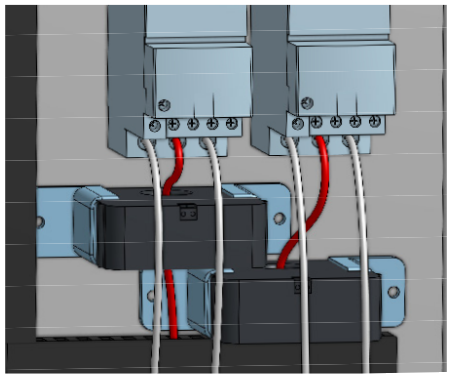
Fig. 9: I-Level Transducer- Well Level Readings



Place I-Level on floor of wet well. Wire Analog 1 to the I-Level as indicated by the red and blue wires.

Fig. 10: Install Amp Probes

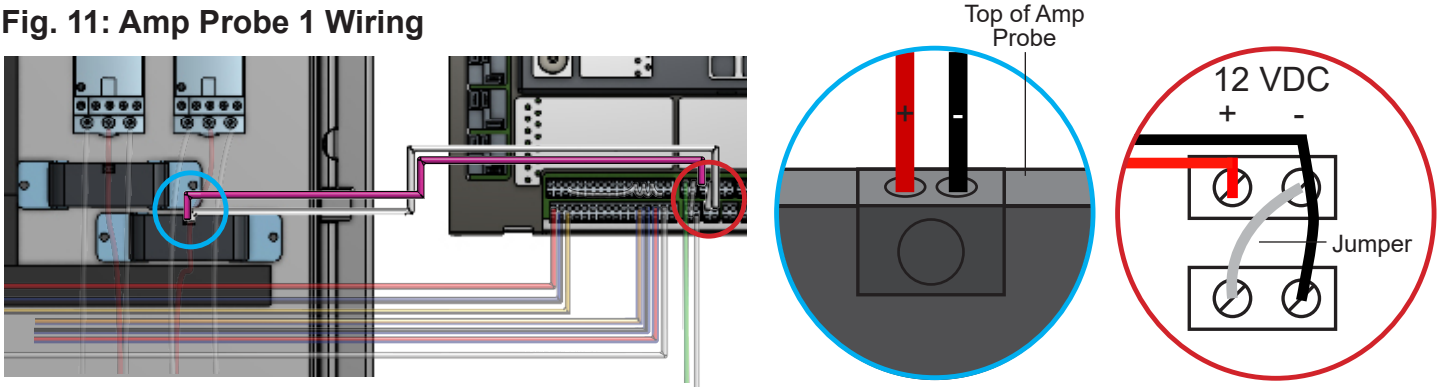




NOTE: When installing the signal wires from the Crystal Ball to the amp probe, avoid routing the signal wires too close to the pump power wires, as this may create false signals or alarms.

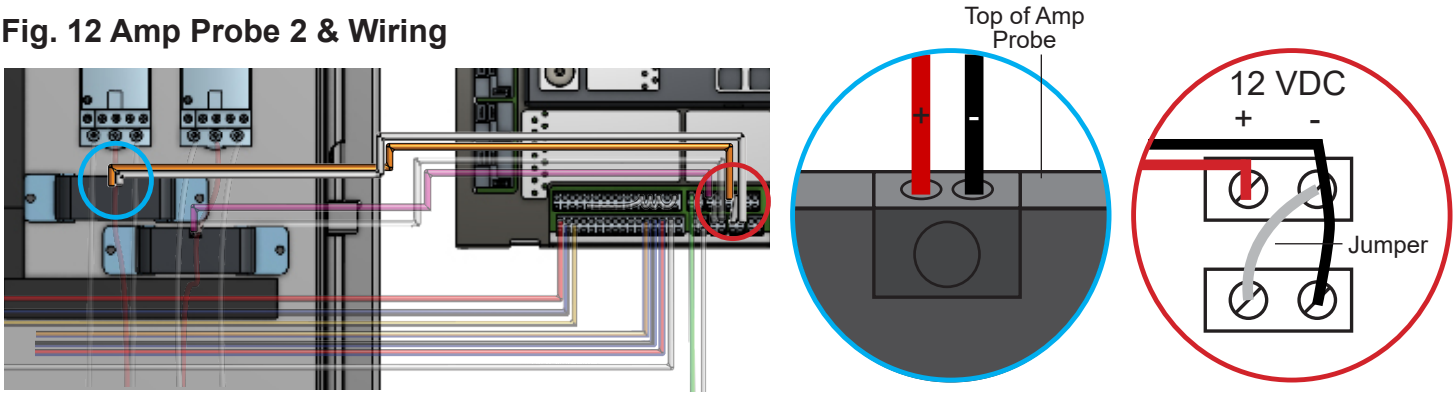
Install both amp probes by mounting them in the control panel beneath the motor starters. Pass one of the hot leads from one of the starters through the center of one of the amp probes, passing the other two wires around the outside of the probe. Repeat this process with the second starter and amp probe. Make sure the selector switch on the amp probe is set to the appropriate setting (50 or 100 amps) for your application.

Fig. 11: Amp Probe 1 Wiring



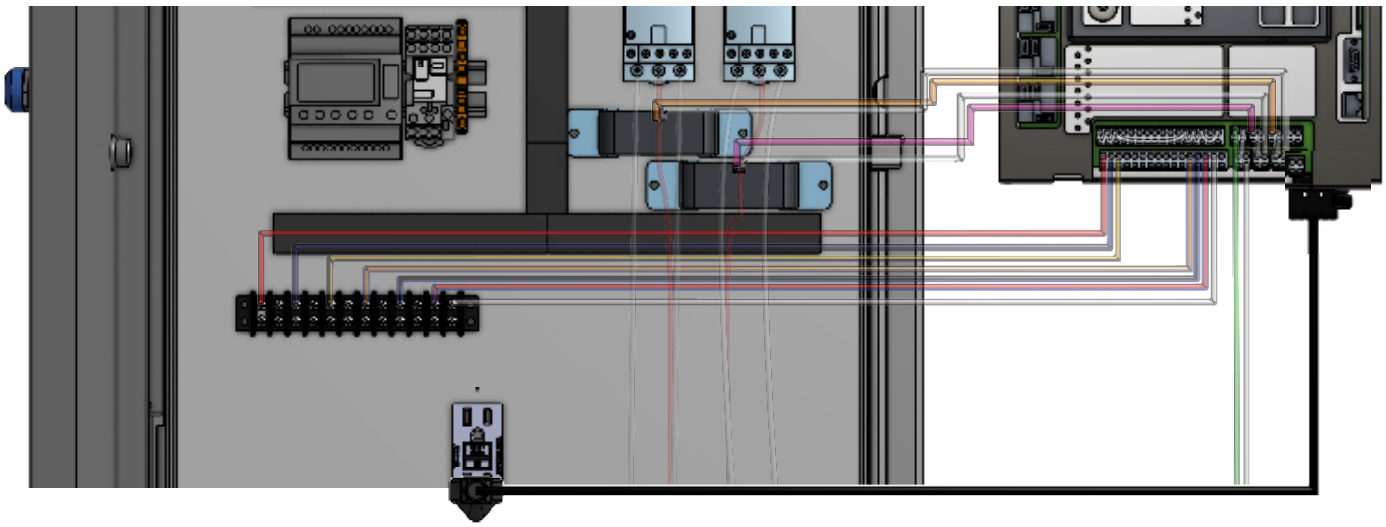
Wire Analog 2 to Amp Probe 1 for Pump 1 as indicated by red and black wire.

Fig. 12 Amp Probe 2 & Wiring



Wire Analog 3 to Amp Probe 2 for Pump 2 as indicated by red and black wire.

Fig. 13 Power



Connect the power supply to the bottom of the Crystal Ball to the outlet in the electrical panel. You can also “hard wire” your H,N,G conductors as desired.

NOTE: This diagram shows how to wire up the basic functions. If you want to add the other eight options, use the wiring diagram shown on previous pages.

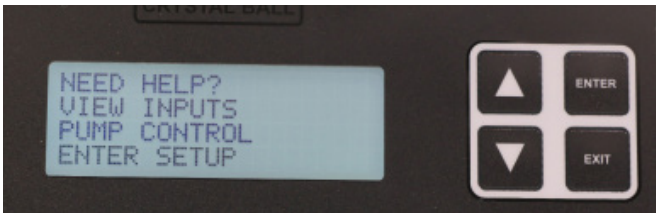
CONFIGURE INTERNAL SETTINGS MANDATORY STEP #4

4.0 PROGRAMMING THE CRYSTAL BALL MENU TREE- MANDATORY

Programming Alarm Delays

4.1 Main Menu - hit ENTER

4.2 Enter Setup - Scroll down using the arrow keys until ENTER SETUP is blinking. Press ENTER.

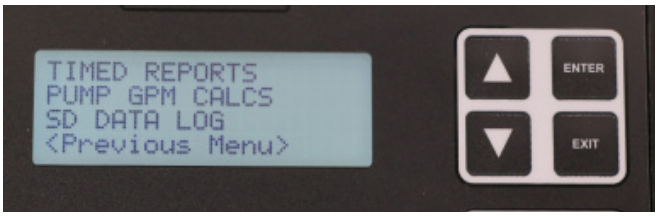


4.3 IMPORTANT STEP- Scroll down using the arrow keys until SETUP DIGITAL INPUTS is blinking. Press ENTER.

At this step you can set the alarm time delay desired for each of your digital inputs. Factory default is 5 seconds on all digital inputs, and 60 seconds for system power failure. Be sure to set delays that don't cause false momentary alarms. To change a time delay, scroll to the input desired using arrow keys. It will start blinking. Press ENTER to change delay. Delay number will start blinking. The number shown is in seconds. Use UP/ DOWN arrow keys to adjust any time delays. When set, press ENTER to save. Repeat for any other digital inputs.

Programming Pump GPM Calculations- Mandatory Step

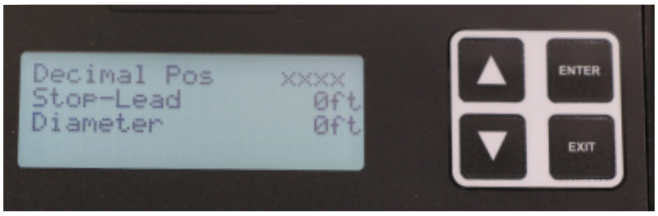
4.4 Scroll down using the arrow keys until PUMP GPM CALCS is blinking. Press ENTER.



4.4.1 Set Max GPM for each pump monitored. Press ENTER and adjust with arrow keys.
NOTE: This value should be greater than what the pump is rated for, usually between 1.5 and 2 times the rating.

4.4.2 Select the shape of your wet well
OPTIONS: Cylinder, Rectangle

4.4.3 Select a decimal position that makes sense for your application.
OPTIONS: XXXX, XXX.X, XX.XX, X.XXX



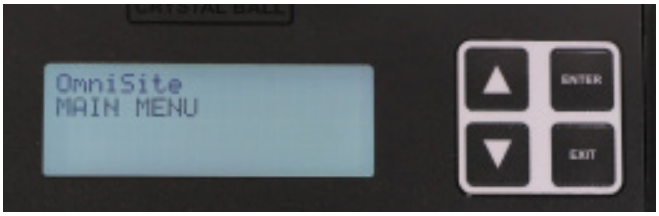
4.4.4 Set Stop-Lead to the distance between start and stop points for your pumps.

4.4.5 Set the diameter (if Cylinder) or width and length (if Rectangle) of your wet well.

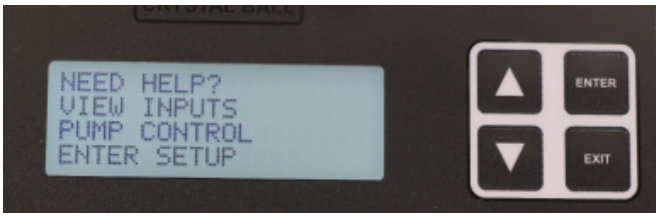
NOTE: Both values are in feet for Cylindrical and Rectangular wet wells.

Programming Analog Inputs- Mandatory Step

4.5 Main Menu - Press ENTER



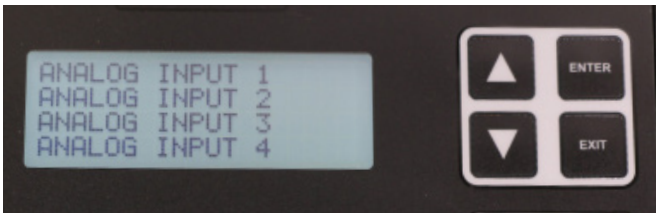
4.6 Enter Setup - Scroll down using the arrow keys until ENTER SETUP is blinking. Press ENTER.



4.7 Scroll down using the arrow keys until SETUP ANALOG INPUTS is blinking. Press ENTER.

4.8 Setup Analog Input 1 -

ANALOG INPUT 1 should be blinking. Press ENTER.



4.9 Using the arrow keys and ENTER button, make the following changes:

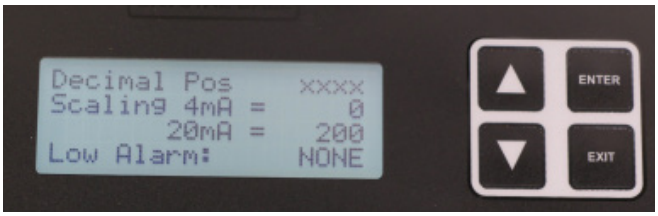
Decimal Position: XX.XX

4mA Setting: 0.00*

20mA Setting: 20.00*

Low Alarm: NONE

**These values should be configured based on the scaling of your device. Since the I-Level transducer we are using is designed for a range of 0-20 feet, we set the scaling accordingly*



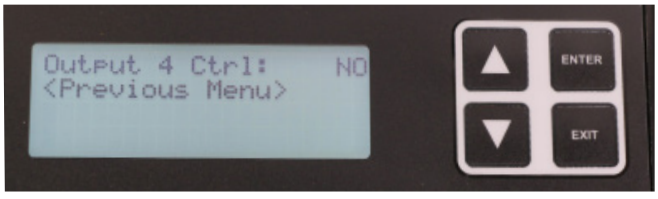
High Alarm: Set in feet (0-20ft) where high alarm should trip.

Deadband: This is how much water level must lower to return to normal (in feet).

Alarm Delay: Set where you won't get false alarms. *Default is 5 seconds, meaning high level must be exceeded for 5 seconds before the Crystal Ball will send a notification.*

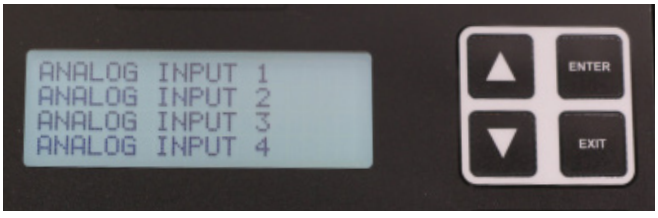
Output 4 Ctrl: NO

Press EXIT when finished.

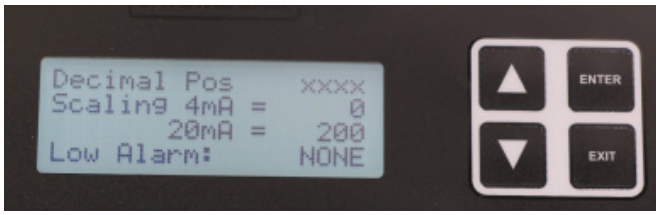


4.10 Setup Analog Inputs 2 -

ANALOG INPUT 2 should be blinking. Press ENTER.



4.11 Using the arrow keys and ENTER button, make the following changes for Input 2:



Decimal Position: XX.XX

4mA Setting: 0.00*

20mA Setting: 50 or 100 amps*

Low Alarm: NONE

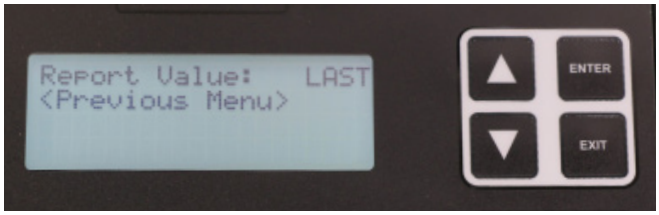
**Since the amp probe we are using is adjustable, you should set the scaling to match the setting on the amp probe.*

High Alarm: NONE

Deadband: 0.0

Alarm Delay: 5 s

4.12 After Alarm Delay has been set, use the arrow keys to scroll down to REPORT VALUE. Verify it is set to LAST.



4.13 Repeat for Analog 3 and 4 (if present)

4.14 Verify the steps in the checklist below have been completed.

IMPORTANT!

FINAL CHECKLIST: ☐ Unit enabled? ☐ Entered GPM info? ☐ Entered time delays? ☐ Signal strength good/green? ☐ Test inputs? ☐ Verify unit transmitted? ☐ Battery plugged in?

MANDATORY WEBSITE SET-UP STEP #5

STEP#5

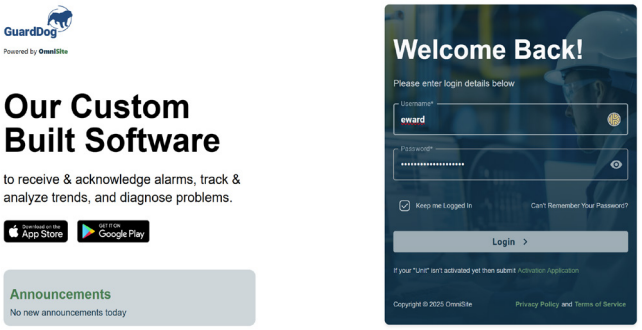
5.0 GUARDDOG WEBSITE SETUP

GuardDog is used to view device status, see current alarms, configure devices, and setup notifications. GuardDog must be configured to send notifications and alarms regarding your OmniSite devices. There are three main steps required to configure GuardDog:

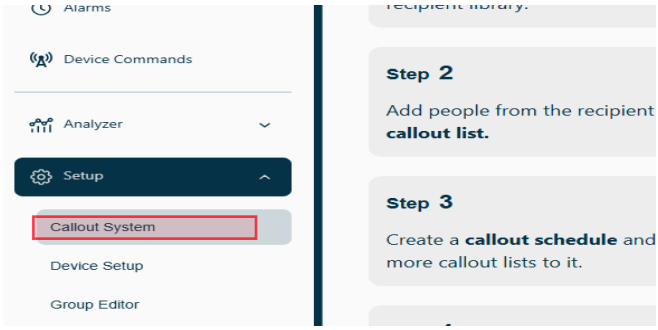
(1) Create Callout List
(2) Create Callout Plan
(3) Configure Alarms

5.1 Create Callout List

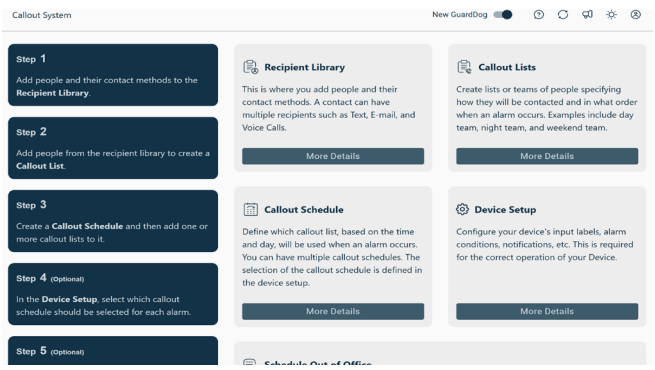
5.1.1. Navigate to *https://guarddog.OmniSite.com/login* and enter your username and password to log in. If you are a new customer, your username and password will be provided when activation of your device is complete.
If you are unsure how to proceed on this step, contact Tech Support at (317) 885-6330 X 3.



5.1.2. Using the navigation icons on the left side of the screen, hover over the gear icon and select "Callout System".

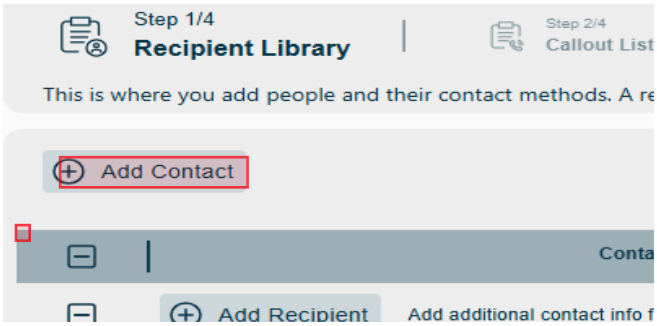


5.1.3. This is the main page for your callout system. Follow these steps to create your cohesive callout system. Click on the recipient library "more details" button to begin the steps.

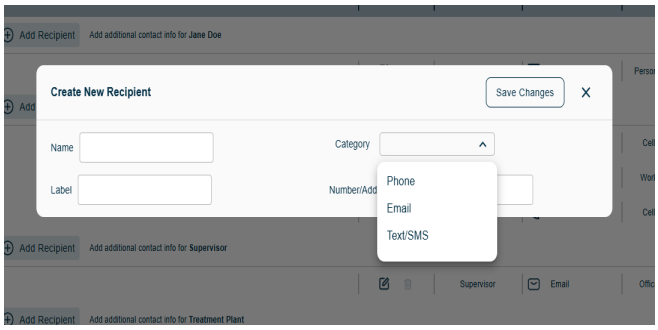


5.1.4. Add new recipients with the ADD CONTACT button at the top. Your list must have at least two of the three required methods of notification; Phone call, Text, or Email. You may have multiple entries for a single individual.

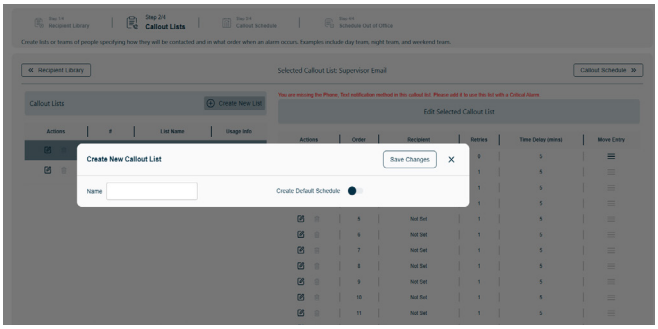
Or add new details to existing recipients by clicking the Add recipient to the left of their existing info.



5.1.5. Set a phone number, email address, text/SMS for each contact. If the person is going to receive multiple methods of contact such as email and text, you will need to set up each method.

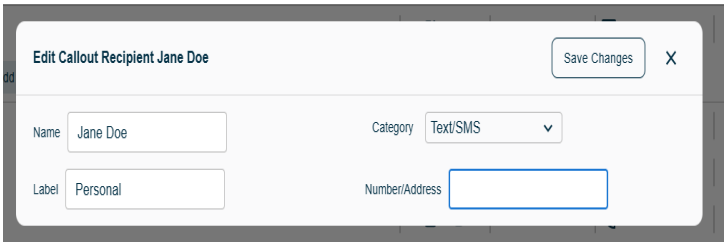


5.1.6. Next, use the arrows to navigate to the callout list. select a Callout List or create a new one by clicking the "create new list" at the top of the left column. When the dialogue box opens, type in the name of the call out list that you wish to create. At this point you choose a "default" schedule to shorten the time that it takes to complete a callout schedule. If you want a customized schedule, just click "save changes".



5.1.8. Once the List is added three methods of contact will be automatically added. Once created you can add and change recipients by clicking the pencil icon on each entry and adding recipients from the Recipient Library. Users may also specify the number of retries and the time delay (in minutes) after each entry. **NOTE:** The entire list will be called once before the retry sequence begins. Recipients are contacted in the order shown with #1 contacted first.

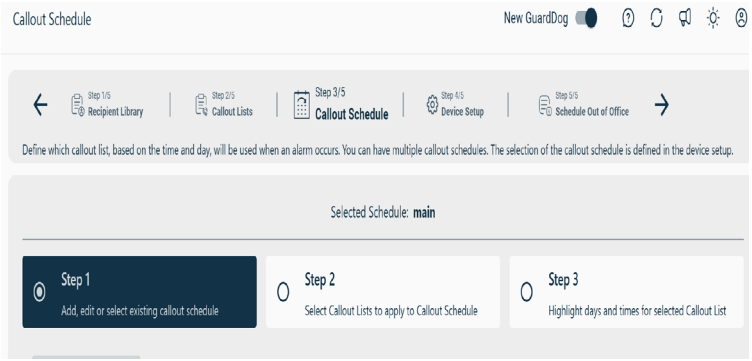
5.1.9 Once users have finished editing an entry, make sure to click "save changes".



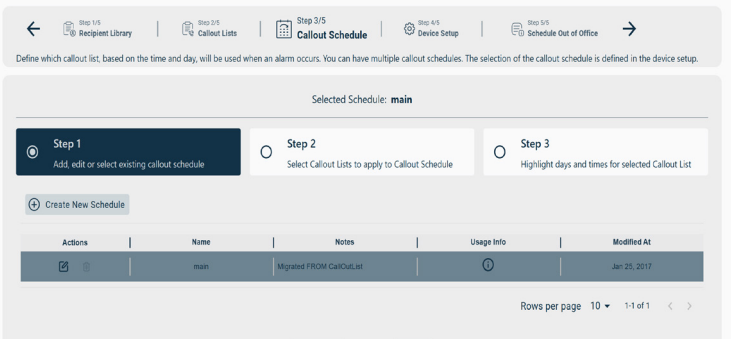
Tip: You can use the same recipients in a variety of lists. Try creating a list with the same recipients in a different order. This can make changing between callout orders very easy when adjusting your on-call schedule.

5.2 Create Callout Schedule

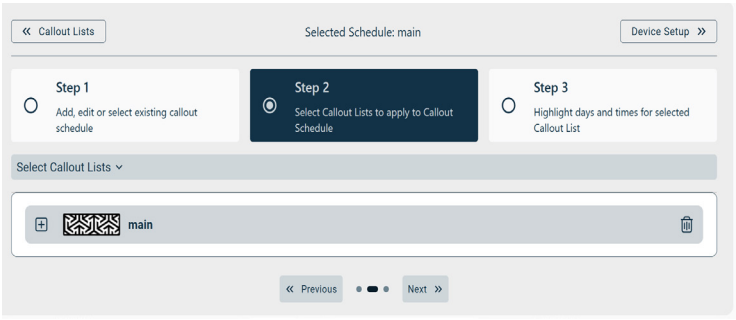
5.2.1. Using the navigation arrow go to "Callout Schedule"



5.2.3. Before moving on, click on the call out schedule that you wish to add call out lists to.



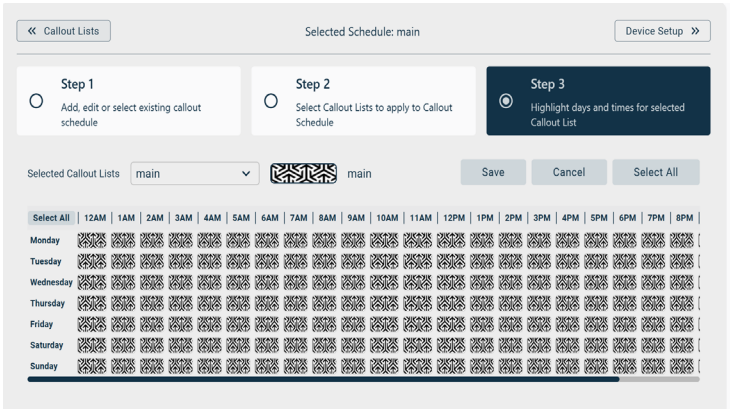
Then, click on the "Step 2" box to apply a "callout list" to "call out schedule". Click on long horizontal bar that "select callout lists" to add a call out list from the drop-down. You can then check the check boxes of the lists that you want to add to the call out schedule. When you are done click the "close button in bottom right of dialogue box.



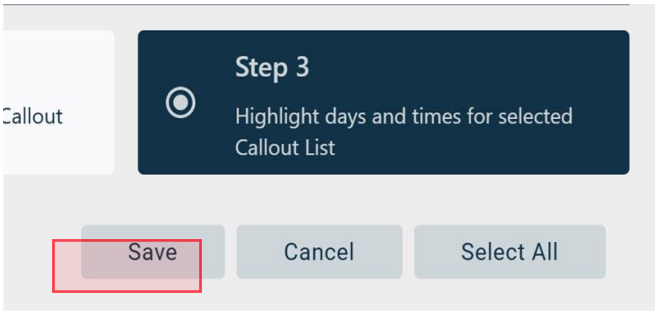
5.2.4. Now click the "Step 3" box and you should see a screen with 168 boxes in which you select when you want call out list to call out during times of the day, and days of the week.

Each call out list will have its own color and scheme. Select which callout list to start populating in the hours and days boxes next to where it says "Selected Call Out Lists".

Then you can select boxes one at a time, click and drag, or select the "select all" button to the far right of the page.

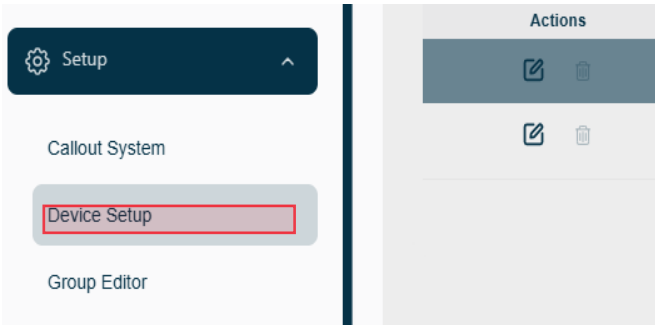


5.2.5. After selecting a color for all 168 boxes, a "save" button will appear. Click on the button to save your work.

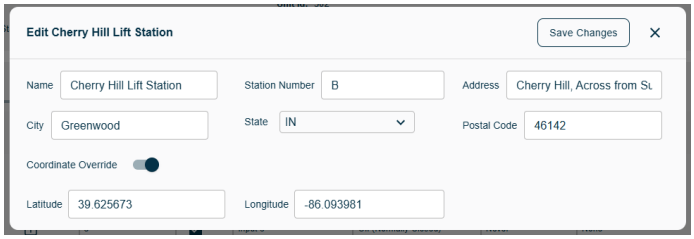


5.3 Device Setup- Mandatory Step

5.3.1. Using the navigation buttons at the top of the screen, click "Setup" and then mouse-over "Device Setup."



5.3.2. Locate the Station Information box. Click the pencil button to edit the information in the box.



Example:
NAME: Station Name
Station Number: Customer Discretion
Address: You can enter the complete address or if you have the GPS Coordinates you can check the Coordinate Override box and enter the Latitude and Longitude.

5.3.1. DIGITAL INPUTS

Use the provided example to configure your digital inputs.

Example: Input 1 should always be a High Wet Well Level Alarm and Input 2 will always be Pump 1 Overload and so on. This is the way the inputs are wired on your terminal blocks in your Crystal Ball unit.

DIGITAL INPUTS | RUNTIME INPUTS | GENERAL ALARMS

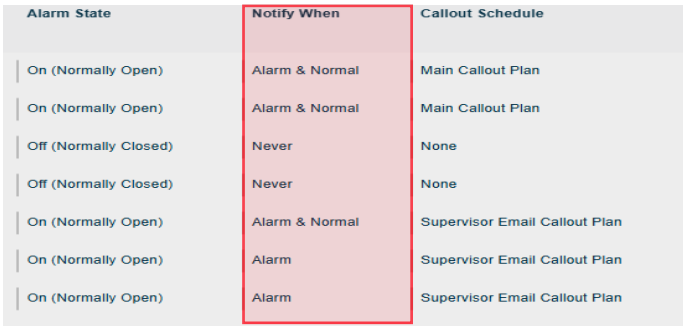
Actions	Input Number	Show	Description	Alarm State	Notify When	Callout Schedule	Style	Pwr Suppress	Simulate Notification
	1	☑	High Wet Well Level	On (Normally Open)	Alarm & Normal	Main Callout Plan	Alarm	☐	
	2	☑	Low Wet Well Level	On (Normally Open)	Alarm & Normal	Main Callout Plan	Alarm	☐	
	3	☑	Input 3	Off (Normally Closed)	Never	None	Alarm	☐	
	4	☑	Input 4	Off (Normally Closed)	Never	None	Alarm	☐	
	5	☑	Phase Failure	On (Normally Open)	Alarm & Normal	Supervisor Email Callout Plan	Alarm	☐	
	6	☑	High Panel Temp	On (Normally Open)	Alarm	Supervisor Email Callout Plan	Alarm	☐	
	7	☑	Low Panel Temp	On (Normally Open)	Alarm	Supervisor Email Callout Plan	Alarm	☐	

5.2.3. If the panel you are wiring into doesn't have the capability to wire one or more of these alarms such as a Pump 1 Seal Failure Alarm or a Low Wet Well Level Alarm, etc., leave that input blank.

NOTE: If your panel does have all the capabilities listed under the wiring section inputs, then make sure you use the correct label for each input.

Actions	Input Number	Show	Description	Alarm State	Notify When	Callout Schedule	Style	Pwr Suppress	Simulate Notification
	1	☑	High Wet Well Level	On (Normally Open)	Alarm & Normal	Main Callout Plan	Alarm	☐	
	2	☑	Low Wet Well Level	On (Normally Open)	Alarm & Normal	Main Callout Plan	Alarm	☐	
	3	☑	Input 3	Off (Normally Closed)	Never	None	Alarm	☐	
	4	☑	Input 4	Off (Normally Closed)	Never	None	Alarm	☐	
	5	☑	Phase Failure	On (Normally Open)	Alarm & Normal	Supervisor Email Callout Plan	Alarm	☐	
	6	☑	High Panel Temp	On (Normally Open)	Alarm	Supervisor Email Callout Plan	Alarm	☐	
	7	☑	Low Panel Temp	On (Normally Open)	Alarm	Supervisor Email Callout Plan	Alarm	☐	

Notify When - Set all to Alarm and Normal condition.



Alarm State	Notify When	Callout Schedule
On (Normally Open)	Alarm & Normal	Main Callout Plan
On (Normally Open)	Alarm & Normal	Main Callout Plan
Off (Normally Closed)	Never	None
Off (Normally Closed)	Never	None
On (Normally Open)	Alarm & Normal	Supervisor Email Callout Plan
On (Normally Open)	Alarm	Supervisor Email Callout Plan
On (Normally Open)	Alarm	Supervisor Email Callout Plan

Power Suppress - The "Pwr Suppress" can be checked for the following alarms:
Pump 1 Overload,
Pump 2 Overload,
Phase Failure,
Pump 1 Seal Failure
Pump 2 Seal Failure.

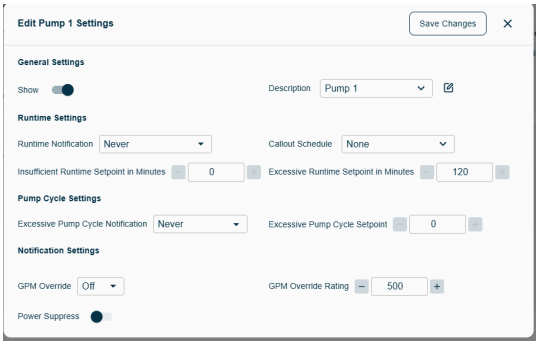
This will stop you from getting multiple notifications when power is lost.

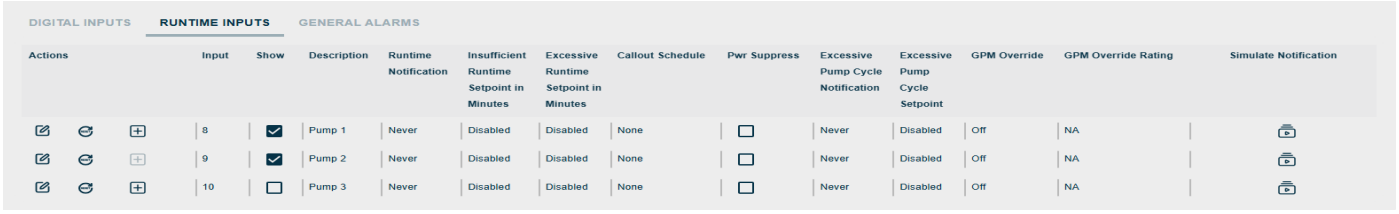
Style	Pwr Suppress	Simulate Notification
Alarm	☐	
Alarm	☐	
Alarm	☐	
Alarm	☐	
Alarm	☐	
Alarm	☐	
Alarm	☐	

TIP: The Power Suppress feature disables notifications from that input during a power failure. While the input still goes into alarm, it will not send out notifications. For this feature to work as designed, the input's time delay must be longer than the power failure alarm delay (both configured in the device).

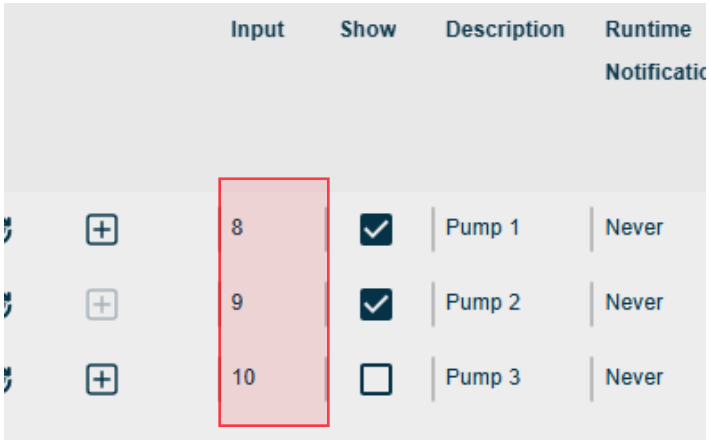
5.3.4. RUNTIME INPUTS

Runtime Inputs provide you with data on Pump Calculations page. They can also provide you with an excess runtime notification (or pump failure notifications when using a device with pump control enabled).

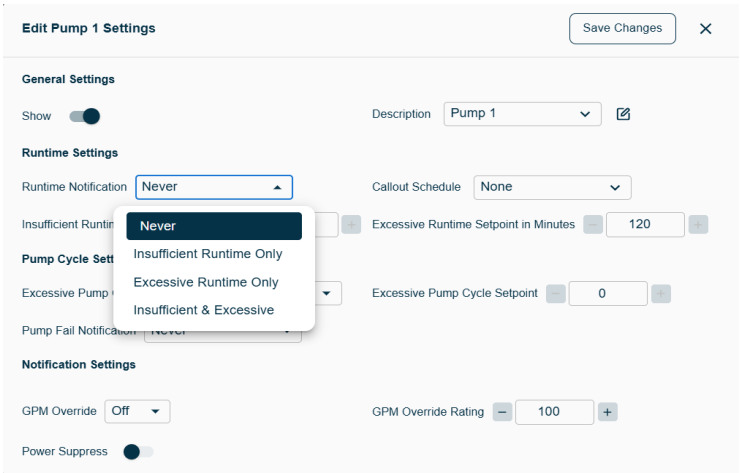




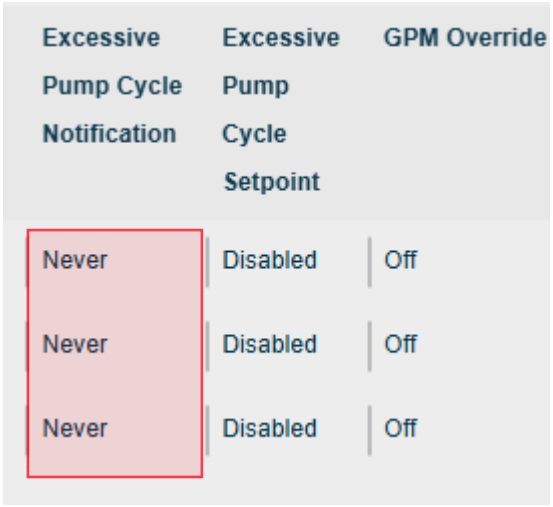
Input -
This is a read only field that indicates the physical number of the input on the device and is provided for your reference.



Insufficient & Excessive Runtime -
Excess Runtime allows you to set up a Maximum amount of runtime for a given input for a 24-hour period. This field is entered in minutes and will cause any runtime reading over this amount to be flagged in red on the Pump Calculations page. You can also receive notifications when this maximum is exceeded by using the Excess Notification column.

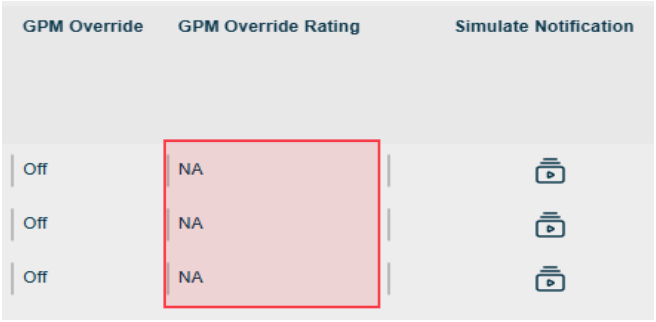


GPM Override -
This column allows you to turn GPM Override on or off. GPM override allows you to replace any value from the device with the value provided in the GPM Rating column. This is very helpful for stations with non-standard wet well dimensions that couldn't be or weren't entered in the device, or for pumps whose GPM rating is above our maximum reading (see your user manual for more information).



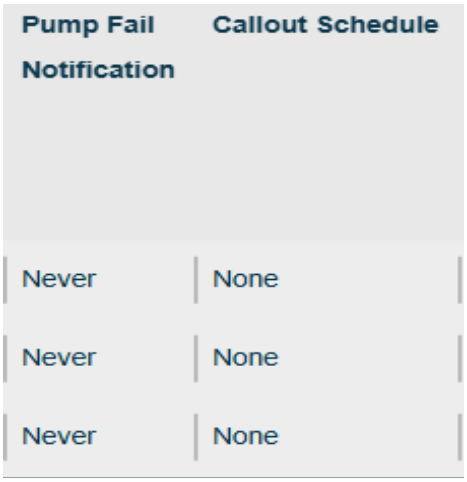
Excessive Pump Cycle Notification	Excessive Pump Cycle Setpoint	GPM Override
Never	Disabled	Off
Never	Disabled	Off
Never	Disabled	Off

GPM Rating -
This is the value that is used for all pump calculations when the GPM Override feature is turned On.



GPM Override	GPM Override Rating	Simulate Notification
Off	NA	
Off	NA	
Off	NA	

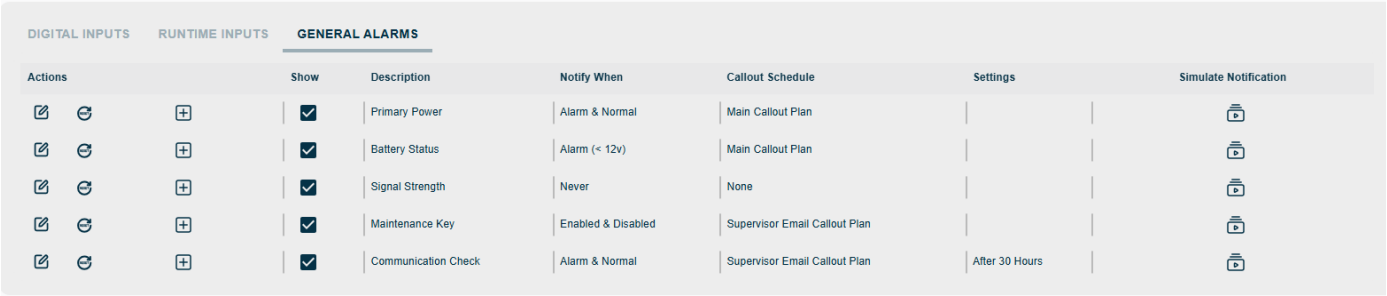
Notify When -
This column is only visible for devices with Pump Control and will be used to notify you of Pump Start Failures when Pump Control is turned on.



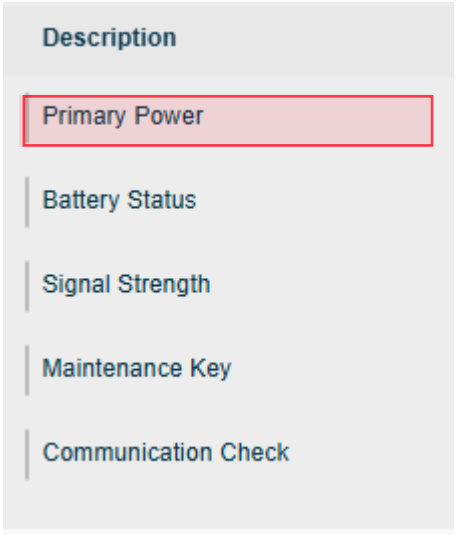
Pump Fail Notification	Callout Schedule
Never	None
Never	None
Never	None

5.3.5. GENERAL ALARMS

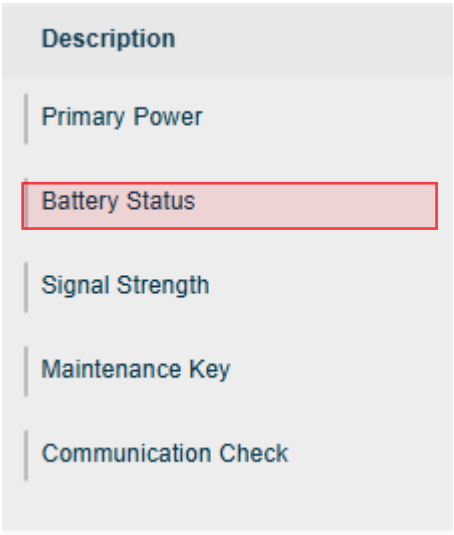
General Alarms are alarms for the following situations:



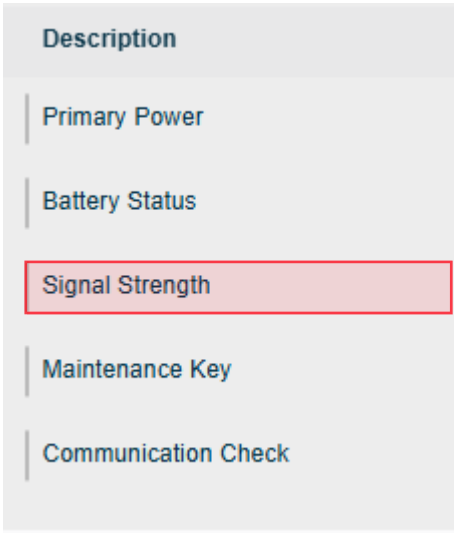
Power Failure -
This will notify you if the main power for the device has been lost. This should always be set as alarm and normal condition and should be set to notify your Critical Call Plan.



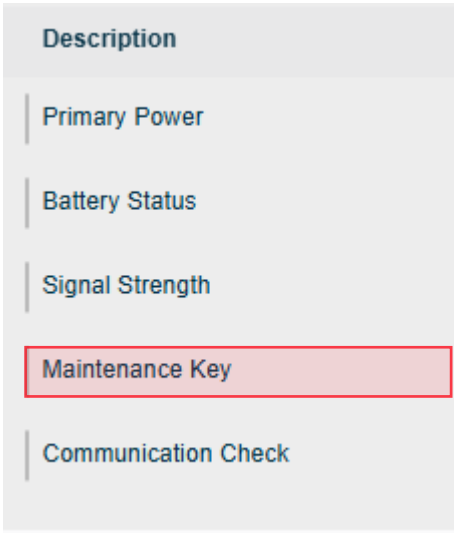
Battery Status -
This alarm allows you to be notified if and when your device's battery voltage falls below an acceptable level. This should be set to Alarm and Normal and set to notify your Non-Critical Call Plan.



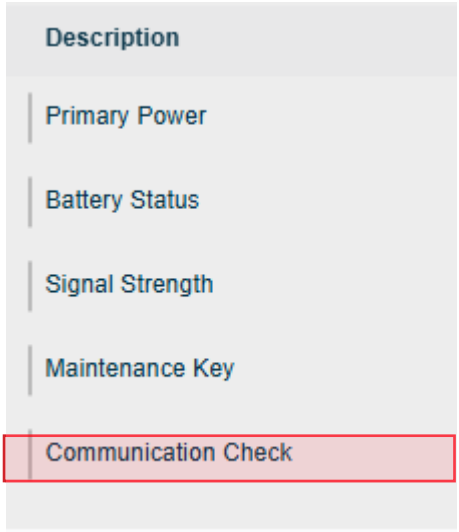
Signal Strength -
This alarm allows you to be notified if and when your device's cellular signal strength falls below an acceptable level. If your device has an unacceptable signal strength, device communications are not guaranteed, and alarm notifications may not be processed. This should always be set as Alarm and Normal, and should be set to notify your Critical Call Plan.



Maintenance Key -
This alarm allows you to be notified when a device is enabled/disabled using a maintenance key at the station. When a device is disabled, no alarm notifications will be processed. This should be set to Disable and set to notify your Non-Critical Call Plan.



Communication Check -
This notification allows you to be notified if a device fails to communicate within a certain time frame. You may choose a setting of either Off, 1 Hour, 30 Hours, or 60 Hours. The hour amount is the amount of time since the device last called in. This means that if you select 30 hours, this alarm will occur after a device has failed to communicate for 30 hours. 1 Hour should only be selected for units that are using the 5- or 15-minute reporting Wireless Plan. This should be set as alarm and should be set to notify your Critical Call Plan.



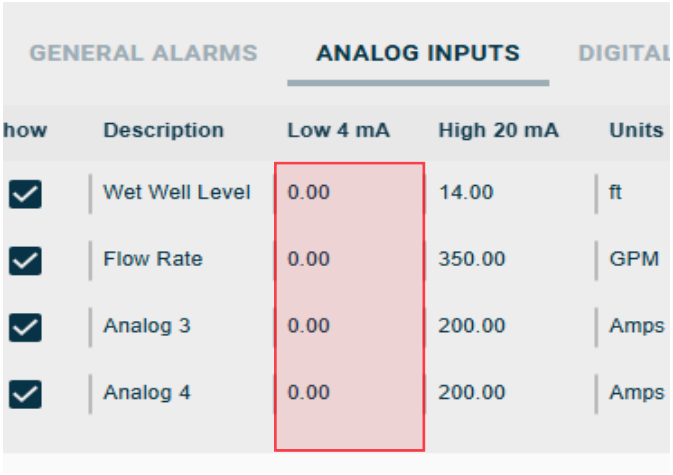
5.3.6. ANALOG INPUTS

Use the sample below to configure your analog inputs. ALL CRYSTAL BALL UNITS SHOULD BE CONFIGURED THIS WAY.

Example: Input 1 will always be I-Level, Input 2 will always be Pump 1 Amps and Input 3 will be Pump 2 Amps. This is the way the inputs are wired on your terminal blocks on your Crystal Ball unit. See page #12

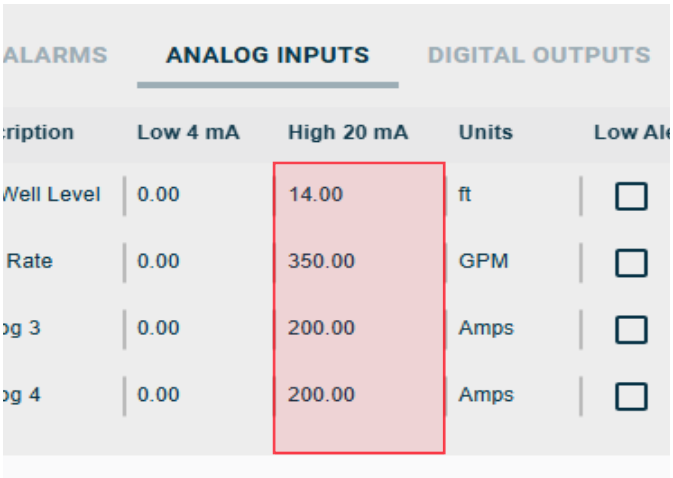
Low 4 mA -

This is the scaling low end equivalent to a reading of 4 milliamps. Our level transducer is 0 to 20', so 4mA should be set to 0.00.



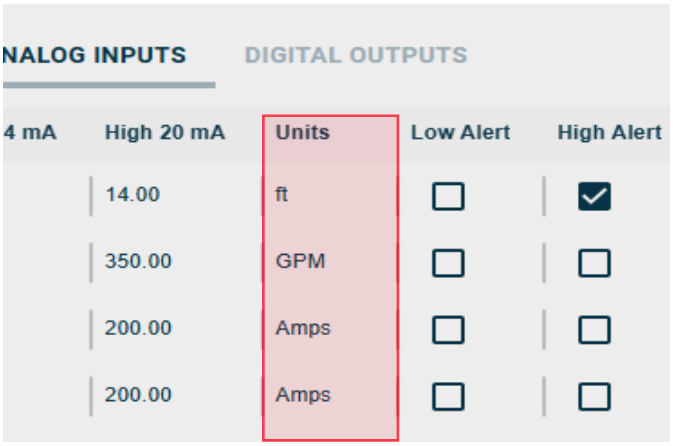
High 20 mA -

This is the scaling high end equivalent to a reading of 20 milliamps. Our level transducer is 0 to 20', so 20mA should be set to 20.00.



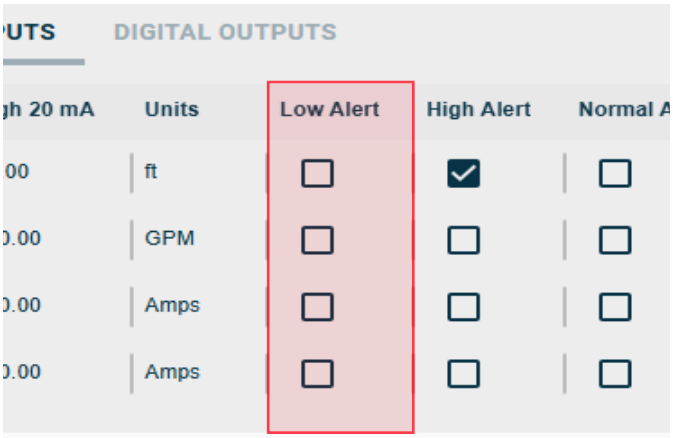
Units -

This is the unit of measurement for your analog input For analog input #1 set this to feet, and analog inputs 2,3,4 set to amps.



Low Alert -

This indicates if you would like to be notified when your input's reading falls below the low alarm set point configured within the device.

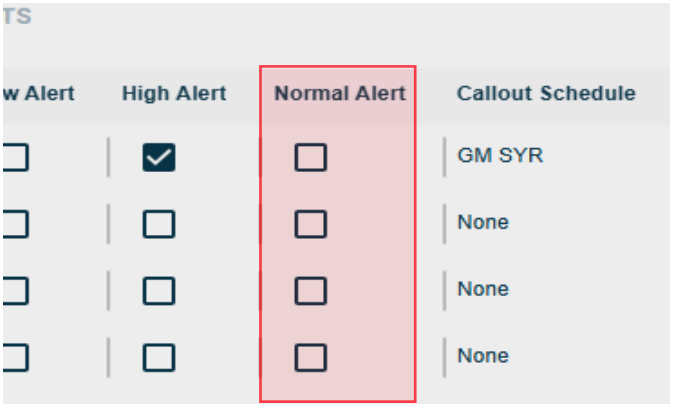


High Alert-

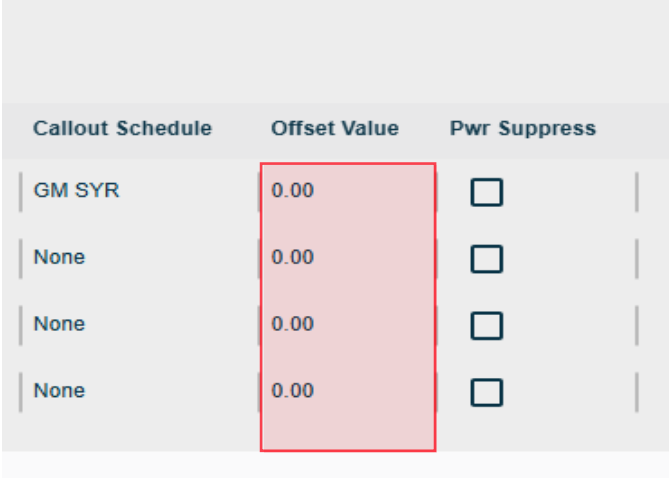
This indicates if you would like to be notified when your input's reading rises above the high alarm set point configured within the device.

Normal Alert -

This indicates if you would like to be notified when your input's reading returns from either high or low alarm.



Offset Value -
The amount to offset the readings for the input. The analog offset is entered positively but is subtracted from the final value.



NOTE: This is rarely used, but a good example would be for a water tower. You may want to know the level of the water - but only at the top (not the stem). The level probe would return a value between 0 and 200 ft (which would include the stem). If the stem is 80 feet you would enter that as an offset and the reading would always be between 0 and 120 ft (0 would be given for an actual reading of 80).
In this case, you should have entered your scaling as 0 to 200 feet and their offset as 80.

Congratulations! This completes your Crystal Ball basic monitoring setup. If you desire to use the below advanced features, simply scan the QR code for the full online manual, which will also include instructional videos.

Advanced Features

- Pump On/Off level control
- Peer-to-Peer wireless control
- Optional wiring diagrams
- Monitoring pulse
- Troubleshooting table
- OmniSite training
- And more!

Scan here for
Virtual Manual

ADVANCED FEATURES

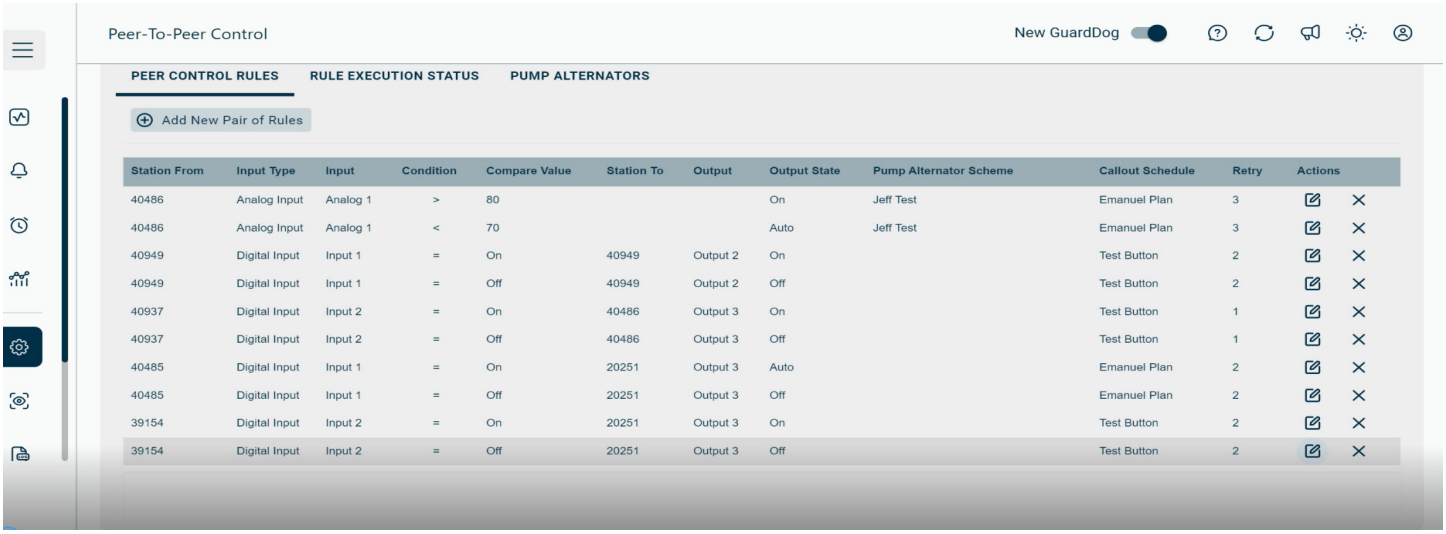
Using Cellular for Peer-to-Peer Control in Real Time

Did you know that OmniSite's Crystal Ball uses the power of the internet and cellular networks to control complex interactions between pump stations and water towers for municipal water or wastewater facilities?

NEW FEATURES

- **Peer-to-Peer Control:** Devices like the Crystal Ball can now communicate directly to take immediate action, such as stopping pumps when high-level alarms are triggered.
- **Real-Time Reporting:** Monitor and manage your systems with live updates accessible from any devices- tablet, PC, or phone-through the OmniSite GuardDog interface.
- **Enhanced Responsiveness:** Experience improved system efficiency with real-time communication, helping you prevent issues before they arise.

New Peer-To-Peer Control- Easy to use Control table- No programming required!



Station From	Input Type	Input	Condition	Compare Value	Station To	Output	Output State	Pump Alternator Scheme	Callout Schedule	Retry	Actions
40486	Analog Input	Analog 1	>	80			On	Jeff Test	Emanuel Plan	3	
40486	Analog Input	Analog 1	<	70			Auto	Jeff Test	Emanuel Plan	3	
40949	Digital Input	Input 1	=	On	40949	Output 2	On		Test Button	2	
40949	Digital Input	Input 1	=	Off	40949	Output 2	Off		Test Button	2	
40937	Digital Input	Input 2	=	On	40486	Output 3	On		Test Button	1	
40937	Digital Input	Input 2	=	Off	40486	Output 3	Off		Test Button	1	
40485	Digital Input	Input 1	=	On	20251	Output 3	Auto		Emanuel Plan	2	
40485	Digital Input	Input 1	=	Off	20251	Output 3	Off		Emanuel Plan	2	
39154	Digital Input	Input 2	=	On	20251	Output 3	On		Test Button	2	
39154	Digital Input	Input 2	=	Off	20251	Output 3	Off		Test Button	2	

OmniSite's sample Peer-To-Peer control table is powerful and completely eliminates complex programming- Let the Pro's at OmniSite Peer-to-Peer for you for a low cost fee- saves time nd confusion

OmniSite's Peer-To-Peer control provides Real-Time Reporting on your pumps, so you can easily see when each pump runs in a graphical format

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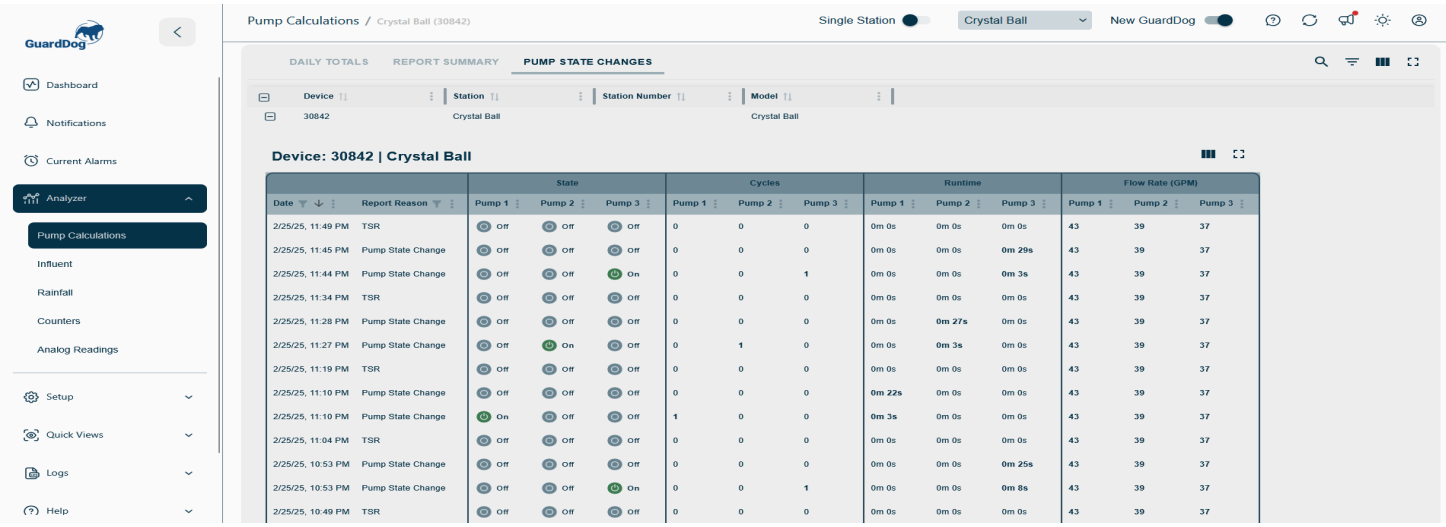
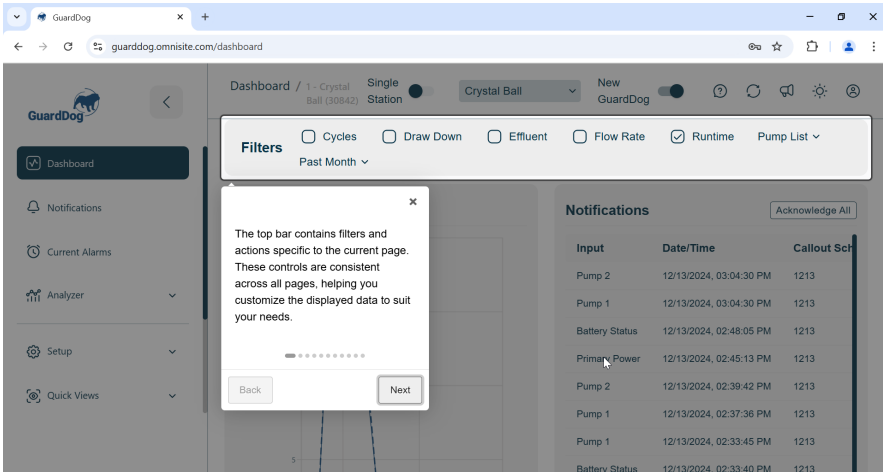
Additional Peer-to-Peer features show status, cycles, runtime, and total station flow using timed drawdowns, eliminating the need for physical flow meters using volumetric calculations

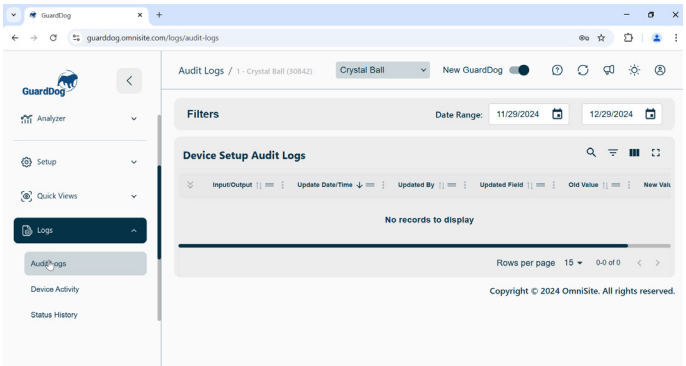


NEW

Real-time Reporting & Audit Logs

- **Digital and Pump status report instantly**
- **Analogs report at 5 minutes unless cross user defined filter value, then instant**





See your OmniSite sales representative for our Real-time reporting package

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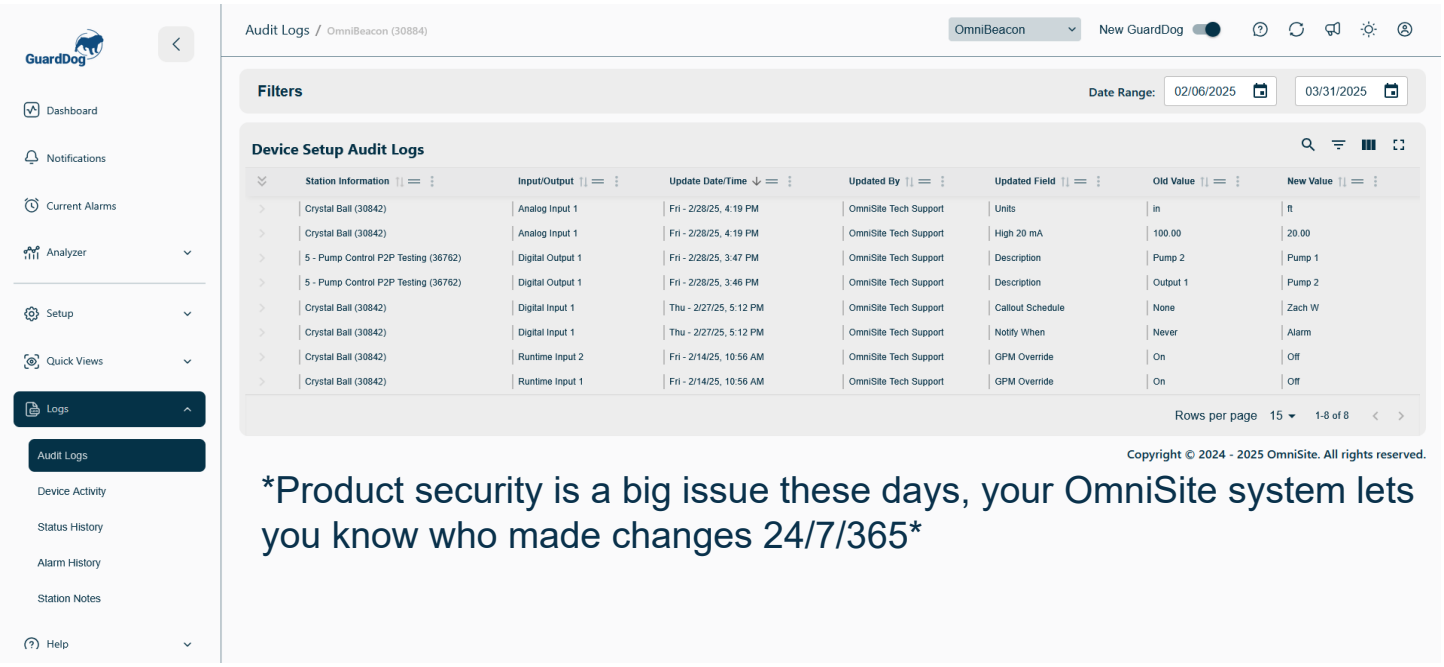
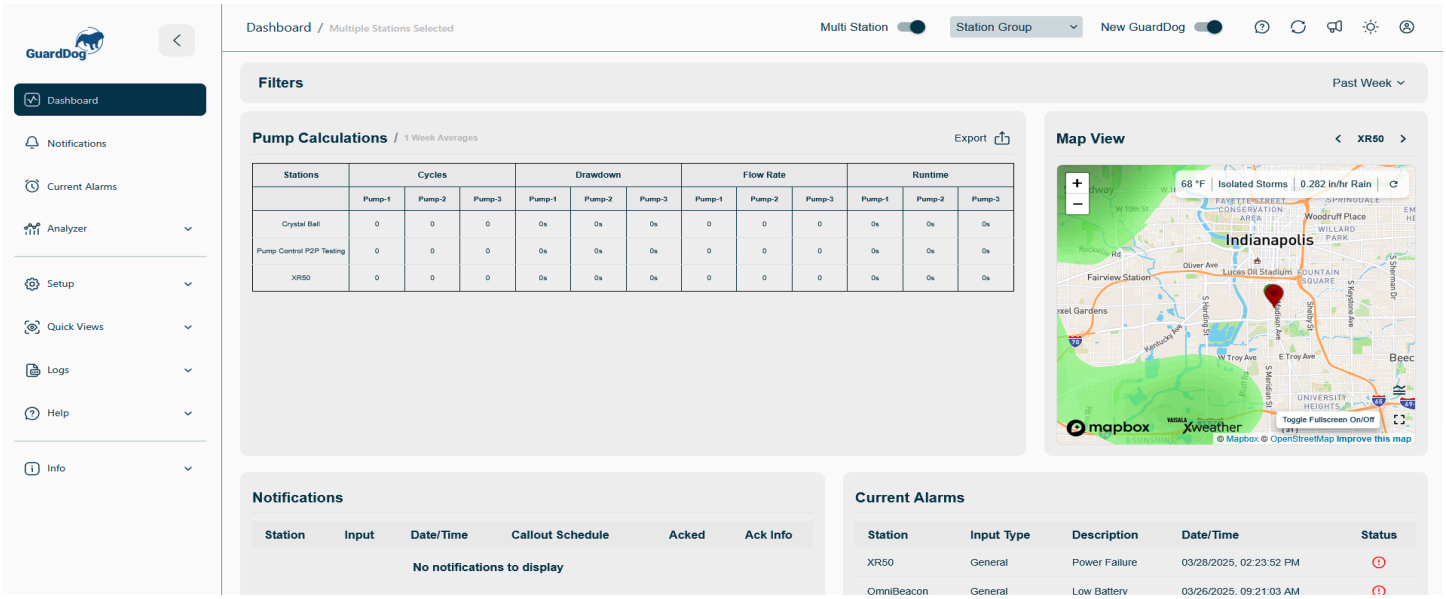
OmniSite Audit Trail For System Security



Product security is a big issue these days, your OmniSite system lets you know who made changes 24/7/365

OmniSite's "Poor Man's" I & I Monitor-No Rain Gauge Needed! Radar Weather Overlay



OmniSite's GuardDog web interface connects with weather service to show you when the next big storm is coming- the amount of rainfall at EACH pump station, the effect on each station's inflow rate, and pump operation!

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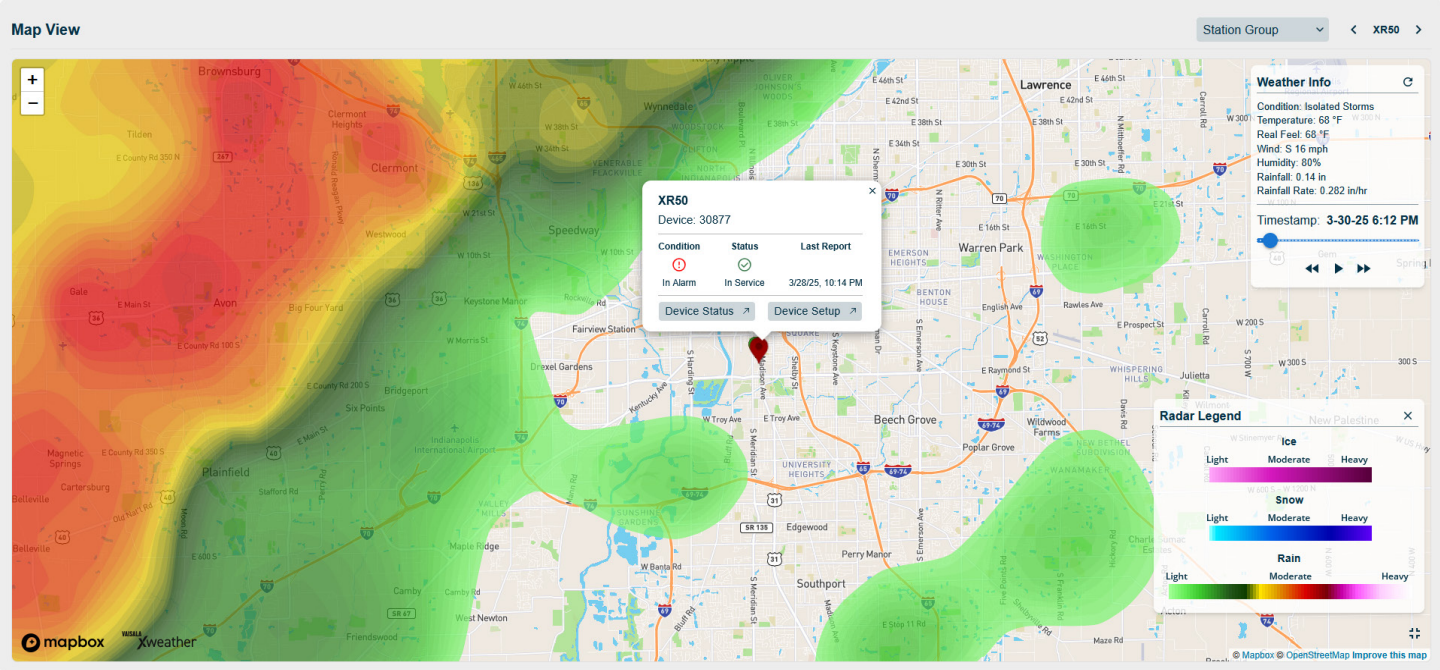
The new Radar Weather overlay will show rainfall amounts at each individual pump station – combined with OmniSite's "Poor Man's" inflow reports, also provides the "Poor Man's" I & I monitor! For all your stations!



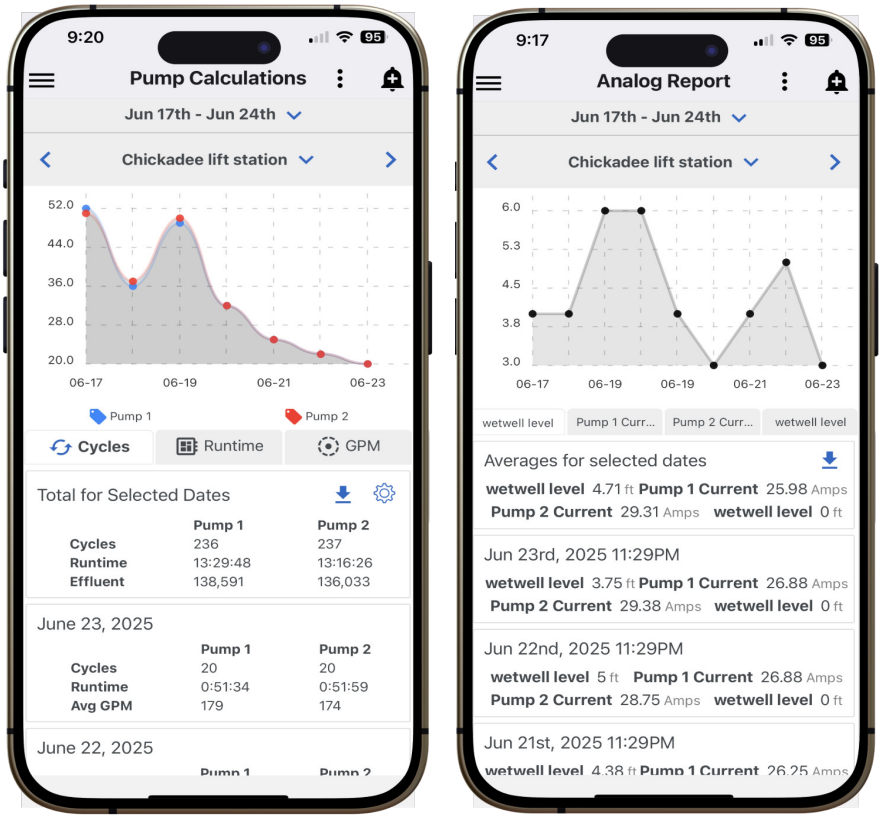
Pump Station Monitoring From Anywhere 24/7/365

All of OmniSite's products can be mixed/matched within your system for a cost-effective solution

OmniBeacon- For small Stations

XR50- For Mid Size stations

Crystal Ball- For our Complete Pump Station Solution



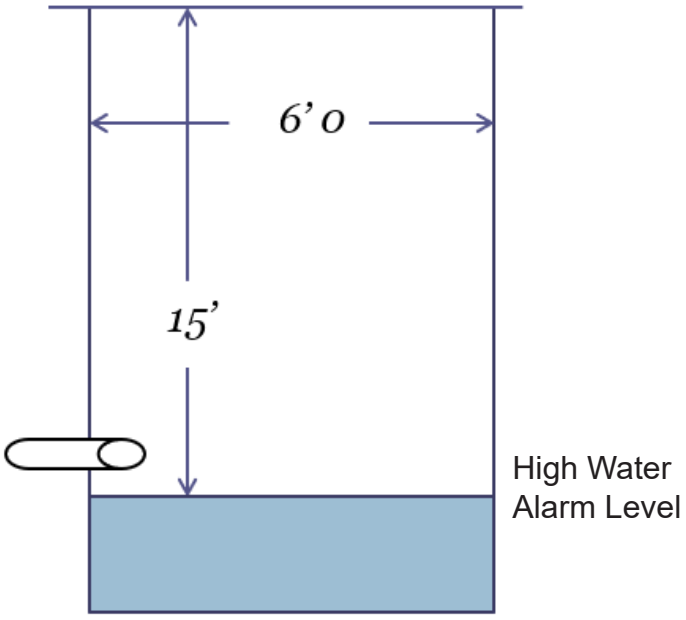
Included IPhone and Android phone apps allow you to keep track of operations anywhere and anytime

Pump Station Monitoring

After You Receive a High-Level Alarm- How Much Time Do You Really Have?

Assume:
6' Diameter Wet Well
Surface to HWA = 15'
Inflow Rate = 250 GPM

All Pumps Inoperable



Wet Well Volume above HWA	=	3,170 Gallons
Volume in Upstream Sewer	=	1,000 Gallons
Total Available Volume	=	4,170 Gallons
Inflow Rate	=	250 GPM

$$\frac{4170\ \text{Gal}}{250\ \text{GPM}} = \textbf{\textit{16.7 Minutes}}$$

*Ask yourself- Can your facility afford to sit a person in a lawn chair 24/7/365 to watch a pump station? Your OmniSite monitors every second of the day to give you the best chance to respond to this situation, as you don't have much time to respond

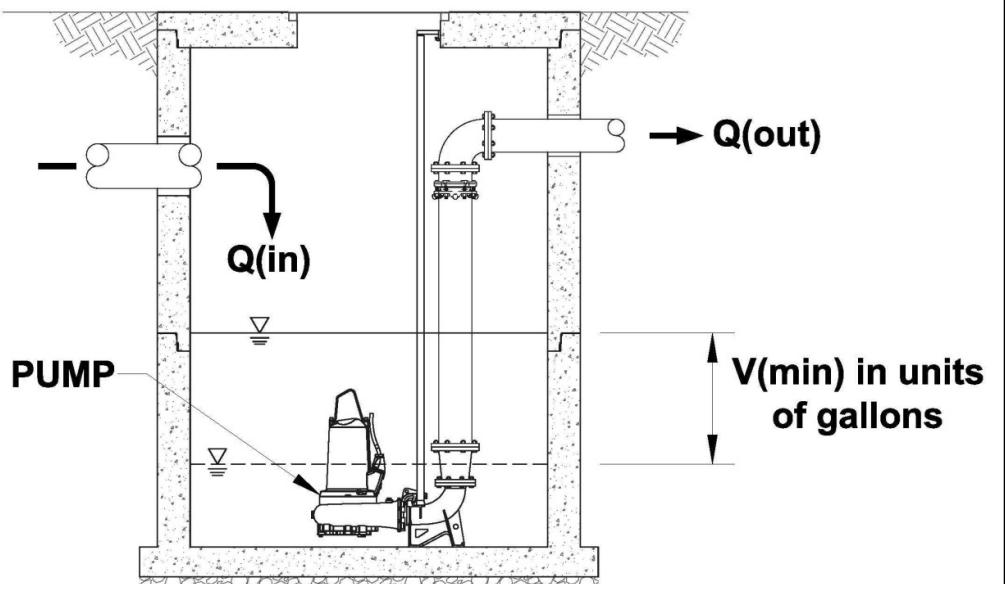
Pump Station Monitoring

Volumetric Flow Measurement/Drawdown Test Used by OmniSite Monitors- How It works

Pumping Rate = Drawdown Rate + Fill Rate

$$\text{Flow} = \frac{\text{Volume}}{\text{Time}} + \frac{\text{Gallons}}{\text{Minute}}$$

Change of level in a wet well of known volume measured against time



Advantages Of Volumetric Flow Measurement

- Inexpensive
- Accurate Under Most Conditions
- No Space Requirement
- Easy to Install

Limitations of Volumetric Flow Measurement

- Wet Well Volume Must be Accurate
- Inflow Cannot Exceed pumping rate of one pump
- Constant speed pumps only (no VFD’s)
- Should not be used for billing purposes
- Soft starts are less accurate as ramp up and ramp down times are increased

REPORTS

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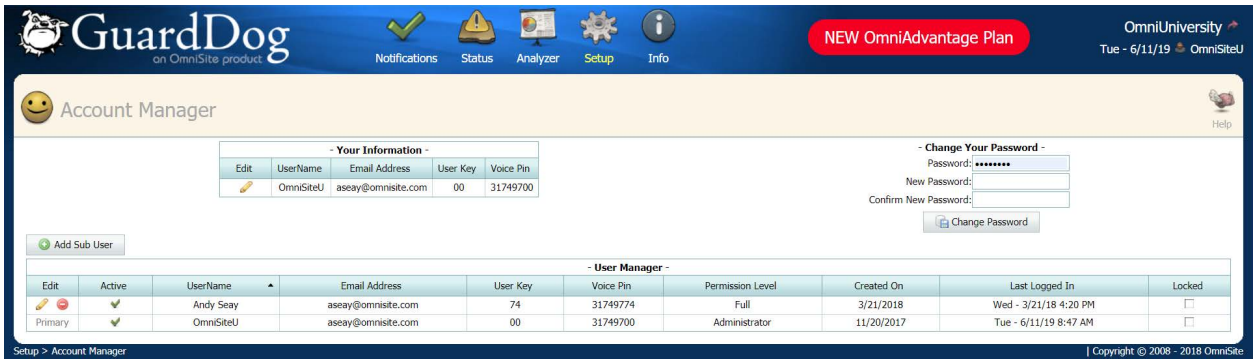
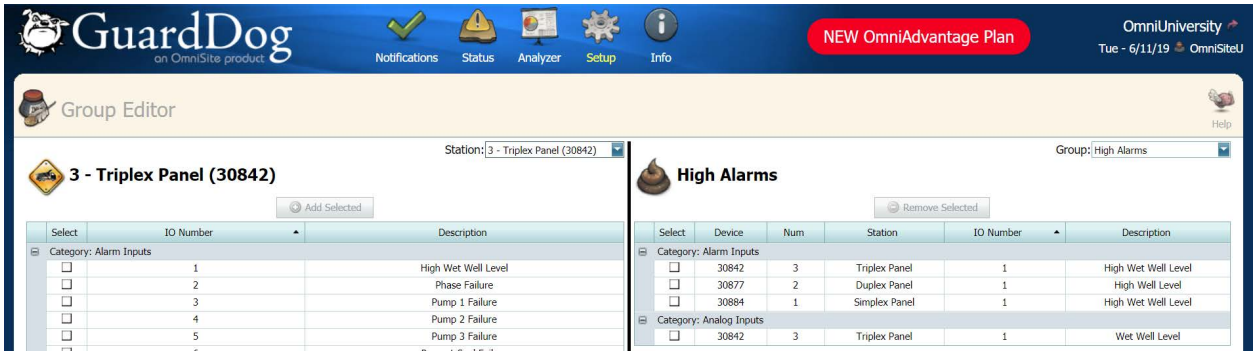
Account Manager



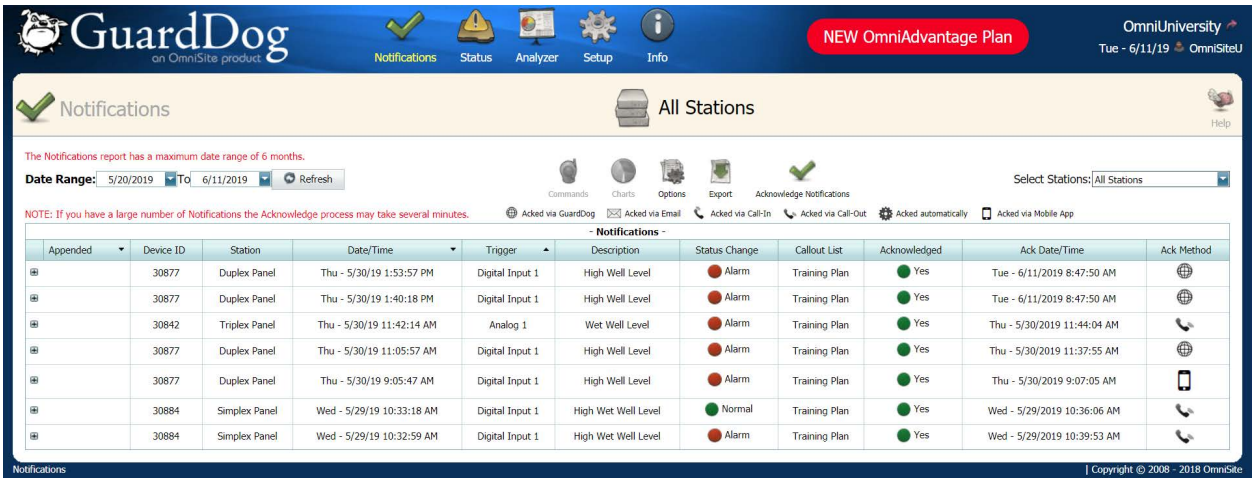
- Displays current user information
- Lists all users on the account with information about each entry
- Allows the user to change their password
- Allows Administrators to add new users and select permission levels
    - Administrator has full access to all features and settings
    - Full can edit settings and view all screens
    - ReadOnly can view all screens in GuardDog, but cannot edit any settings

Group Editor



- Used to create and configure groups of inputs, which allows for customized views in the **Group Status** page, under the Status tab
- Inputs from multiple devices can be grouped together for easy viewing
- Default groups for Battery Status, Main Power, and Signal Strength already exist

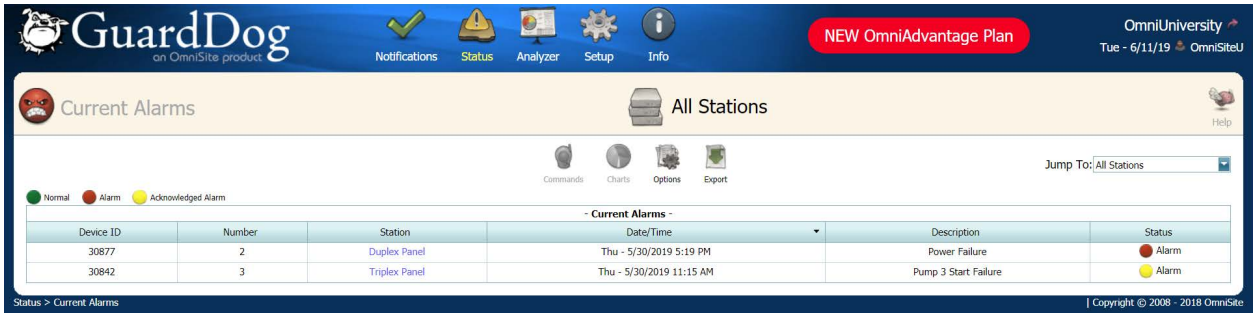
Notifications



- Displays all notifications from a selected station or all stations during a selected date range (set on the top, left-hand side of the page)
- Allows user to acknowledge any displayed notifications
- Allows the currently displayed data to be exported in a variety of formats

Status

Current Alarms



- Displays all current alarms for a station or all stations
- **Commands** button allows the user to request reports from the selected device

Quick Views

- Most pages here display similar information, arranged in different, easy-to-read formats

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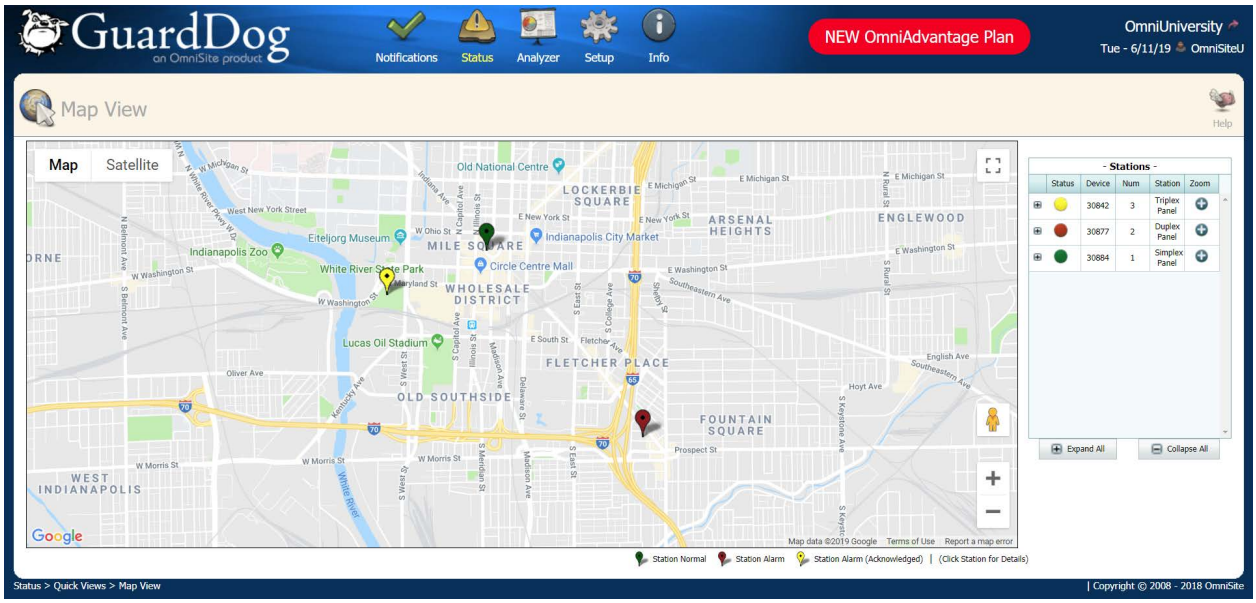
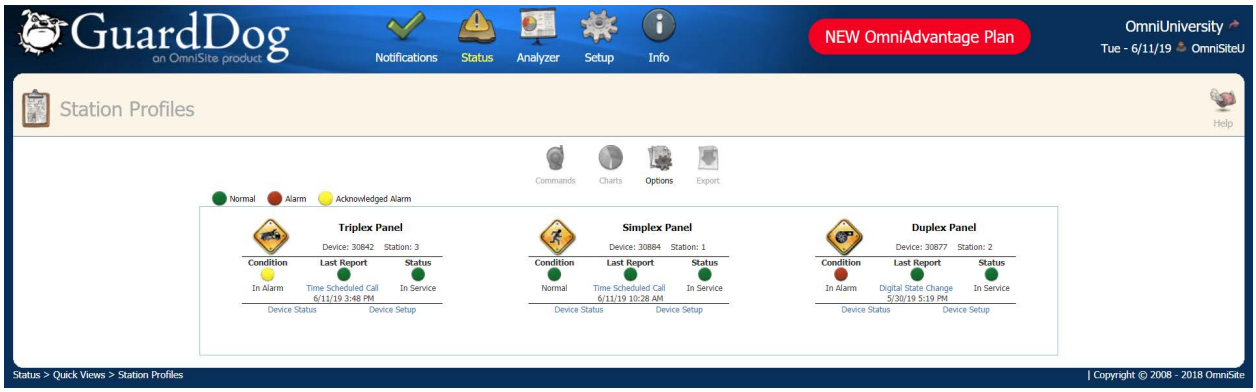
Map View



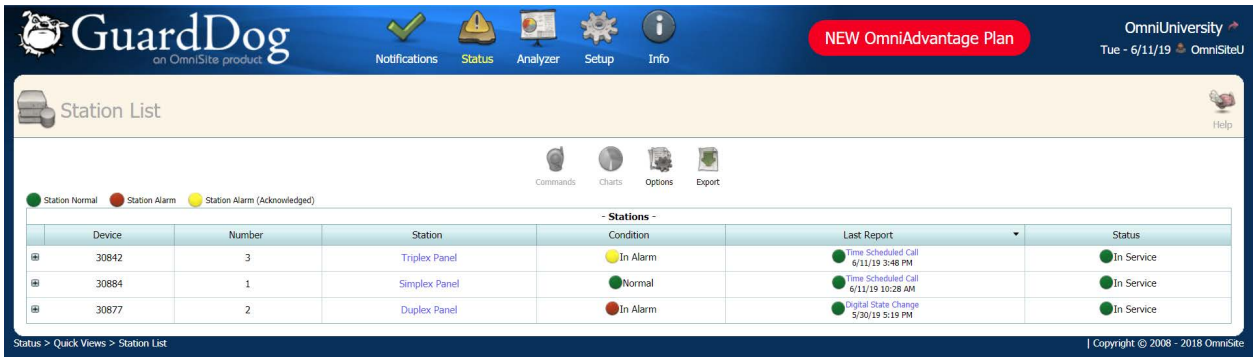
- Displays all stations (with a valid address) on an interactive map as pins
- Each pin is color coded in respect to the alarm status of that station
- Stations are also listed along the right side of the page
- Clicking on a pin will display additional information about that station

Station Profiles



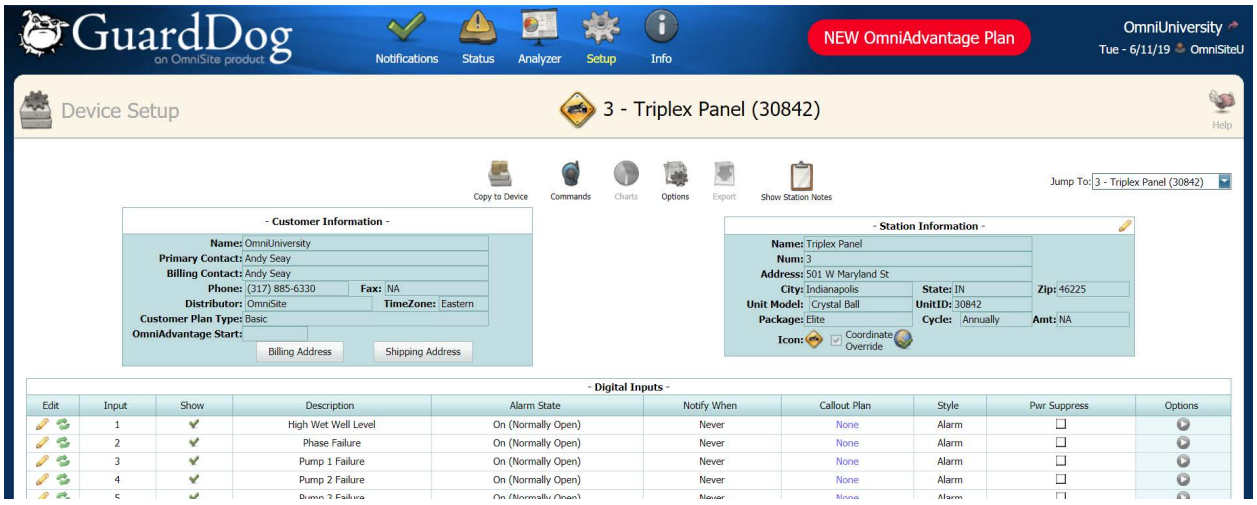
- Displays all stations graphically, with simple details about each station
- Stations can be rearranged using the **Options** button
- Each station has a link directly to its Device Status and Device Setup pages

Station List



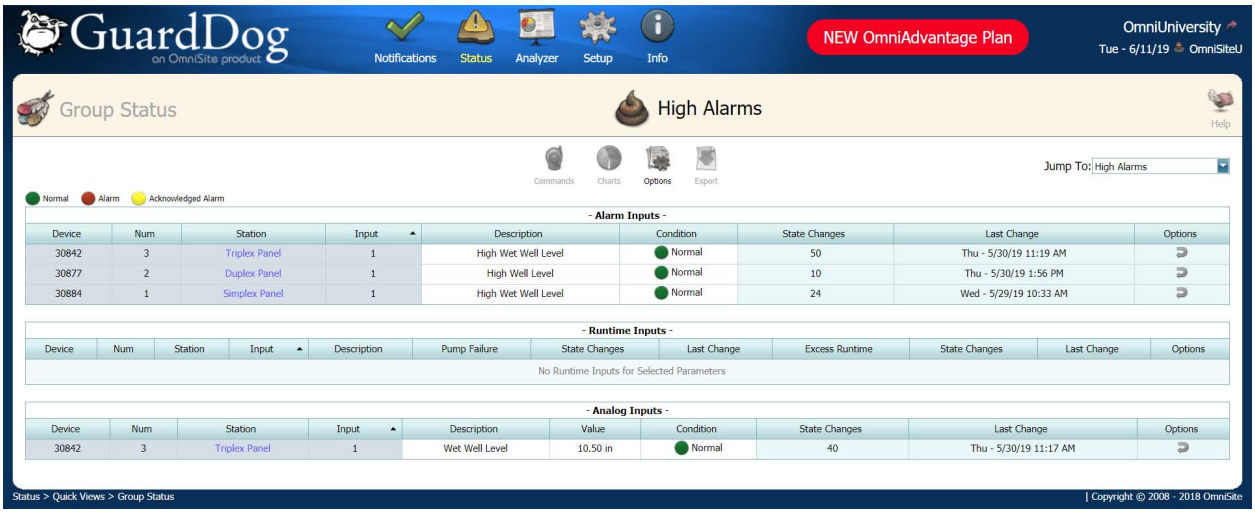
- Displays all stations in a list format with simple details about each station
- Each entry can be expanded with the plus button on the left side to display additional information
- Clicking the Station Name will take the user directly to the Device Status page for that station
- List can be exported in a variety of formats

Device Status



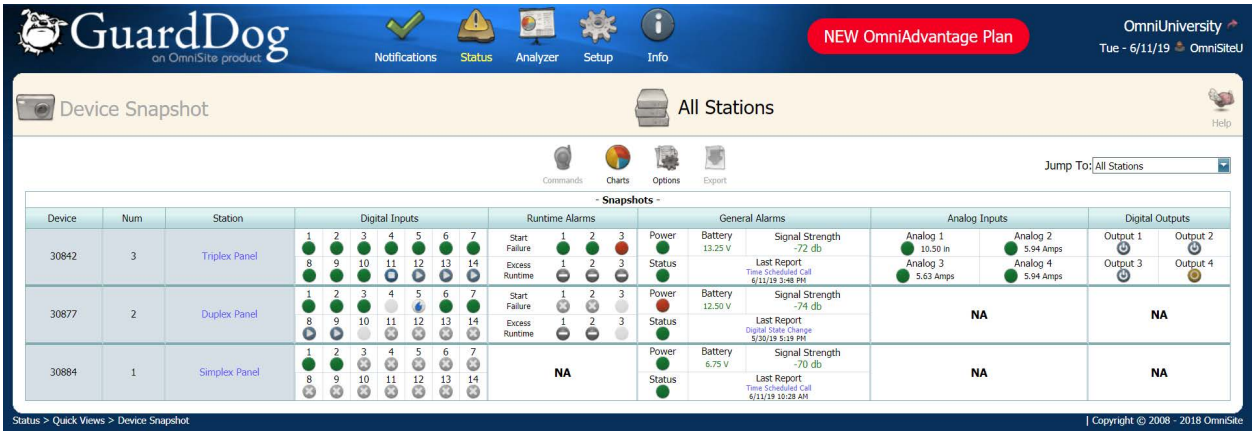
- Displays an in-depth summary of all inputs on a selected station
- Includes data about number of state changes and most recent state change for each input
- **Commands** button allows user to request reports or control the output relays on a Crystal Ball device through forward commands

Group Status



- Displays grouped inputs from multiple stations on a single screen
- Clicking a Station Name will take the user directly to the Device Status page

Device Snapshot

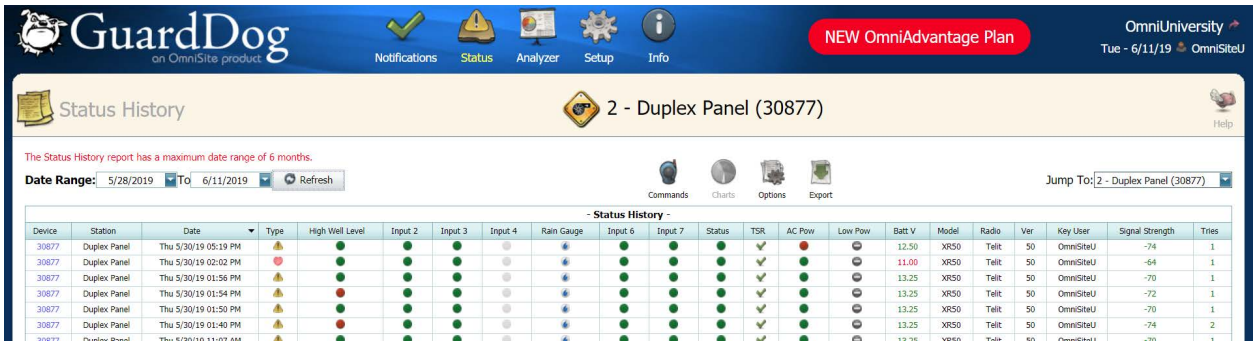


- Displays a quick overview of one or all stations, including data from all inputs
- **Charts** button allows user to view a graph of signal strength readings

Logs

- Device Activity, Status History, and Alarm History all display data from a selectable date range
    - **Device activity**: displays a list of all events (pump calculations, time scheduled reports, input state changes) and where they were posted

- **Status History**: displays a graphical log of input changes, hardware configurations, and responses to forward commands
- **Alarm History**: displays the history of alarms for each input on a station, including start and stop times, with duration and totalization

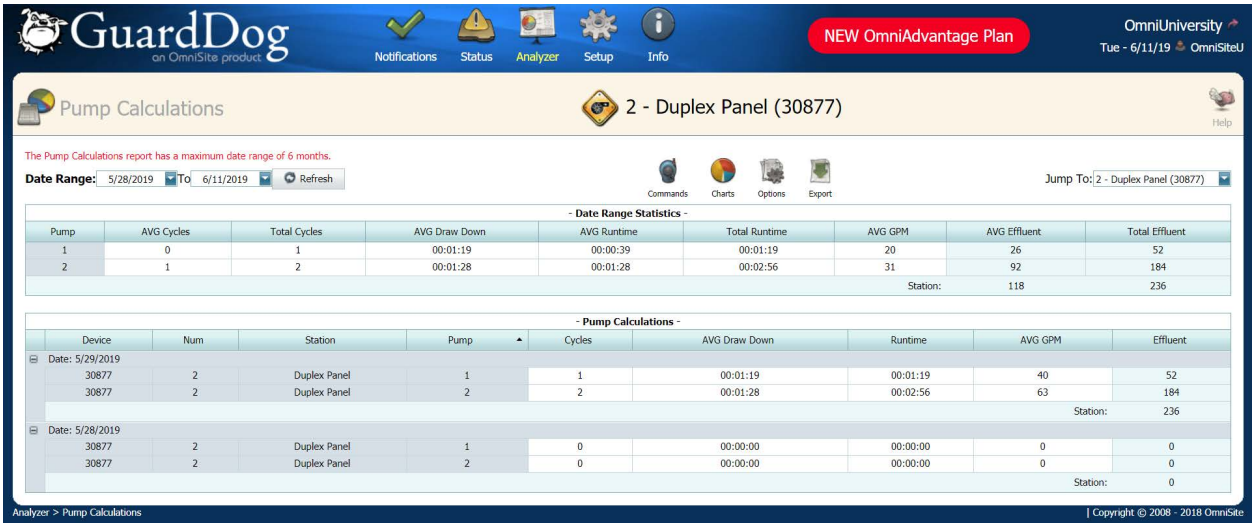


- **Station Notes** displays notes for one or all stations and allows editing and exporting of notes

Analyzer

- These sections display data collected by devices and allow data to be displayed in graphs

Pump Calculations



- Displays ON/OFF cycles, runtime hours, GPM, drawdown, and station effluent
- Data is displayed for a selectable date range, with totalized figures at the top and day-by-day breakdowns listed below

Influent

- Displays influent for each station over a selectable date range, broken down into two-hour increments for each day
- Allows a comparison between influent and rainfall data, if both are collected

Tip: Comparing influent to rainfall is a good way to help analyze sources of infiltration into a wastewater system.

Rainfall

- Displays rainfall data for each station over a selectable date range, broken down into two-hour increments for each day
- Allows daily totals to be viewed

Counters

- Displays data for up to two counters per station, including totalization

Analog Readings

- Displays 4-20mA readings for up to 4 analog inputs on a selectable device
- Input readings are scaled based on the values set on Device Setup page

Info

Help

- **Guides**: Provide a full walkthrough of all features of GuardDog, including details about all functions and how to properly utilize them
- **Frequently Asked Questions**: List of FAQs with answers
- **Video Library**: Introduction and Installation videos

Contact Us

- Contact details for OmniSite or the user's sales representative

Warranty

- Displays warranty information for all devices on current account
- Provides access to downloads for service contract and warranty documents

Service Agreement

- Displays the service agreement for using GuardDog

TROUBLESHOOTING

6.0 TROUBLESHOOTING

6.1 Troublshooting guide

PROBLEM	PROBABLE CAUSE	RECOMMENDED ACTION
Unit does not transmit alarms, and no control panel lights are illuminated	**No Power**	• Check 120 VAC or 12 VDC power source
Unit does not transmit alarms, and the power source is present	**Cellular Signal reception is not suitable**	• Inspect the cellular signal strength LED on the face of the unit. If it is NOT GREEN, you MAY have a weak signal • Call OmniSite at 317-885-6330 • We will observe the transmitted signal strength and suggest options for you - which many include replacing or relocating the antenna
My field alarm contacts open and close, but the OmniSite unit does not appear to be doing anything	**Wiring problems or contacts have not remained open or closed for at least 5**	• The OmniSite RTU will transmit an alarm signal if it changes “state: and remains in that “state” for at least 5 seconds • NOTE: This is a user adjustable time delay. It may be longer for your application. • Disconnect the field wires from the RTU for the alarm input in question. • Using a volt-ohm meter determine that your contacts are actually opening and closing. If not, make a field repair. • If they are, check on the Crystal Ball front panel to see that the associated LED goes on/off as your field signal changes. • Lastly, visit Guarddog.OmniSite.com to confirm that you have an associated alarm trigger and callout list specified for the event.
My pump runtime readings are not automatically updating in GuardDog	**Time Scheduled reports are not enabled**	• The OmniSite RTU reports pump runtimes and other values on time scheduled intervals (typically once/day). • Manually “enable” this feature on GuardDog.

PROBLEM	PROBABLE CAUSE	RECOMMENDED ACTION
cont.	**cont.**	• You can additionally manually request the pump runtime values by issuing the appropriate command in GuardDog.
The OmniSite unit keeps calling me with alarms; when I visit the site, I cannot find any problems	**OmniSite RTU is receiving "false" alarms**	• Your OmniSite RTU is a sophisticated piece of electronic monitoring equipment. It is only as good as the equipment it is monitoring. If your control panel is issuing false alarms, the OmniSite RTU WILL REPORT THEM. • Contact your local OmniSite distributor to locate causes for false alarms from your equipment. • Increase alarms time delays to eliminate false alarms
Analog Inputs not working	**Wiring Error**	• First check to see that your analog device is wired EXACTLY as shown in this manual. Correct faulty wiring, or if okay, see below.
	Incorrect Software Scaling	• Connect a milliamp meter to the 4-20mA loop in question and confirm correct 4-20mA signal. • If okay, use the local display/keypad to see that the 4-20mA input is correctly "scaled" and alarm set point applied
Relay Outputs not working	**Wiring Error**	• First check to see that your analog device is wired EXACTLY as shown in this manual. Wiring a relay contact into a field hand-off switch takes experience. If you are not sure, seek a qualified electrician. If okay, see below.
	Incorrect Software Setpoint	• Check your relay (pump) on/off set points have been correctly entered using the local display/keypad.

PROBLEM	PROBABLE CAUSE	RECOMMENDED ACTION
cont.	**Incorrect Software Setpoint cont.**	• Next, check that the pumps(s) are not removed from the software rotation. • Verify that the correct sensor is being used (floats or analog) in set up
	Relay in Manual Control	• Lastly, verify that the software control is in automatic and NOT manual control

Have questions? Contact OmniSite Technical Support at

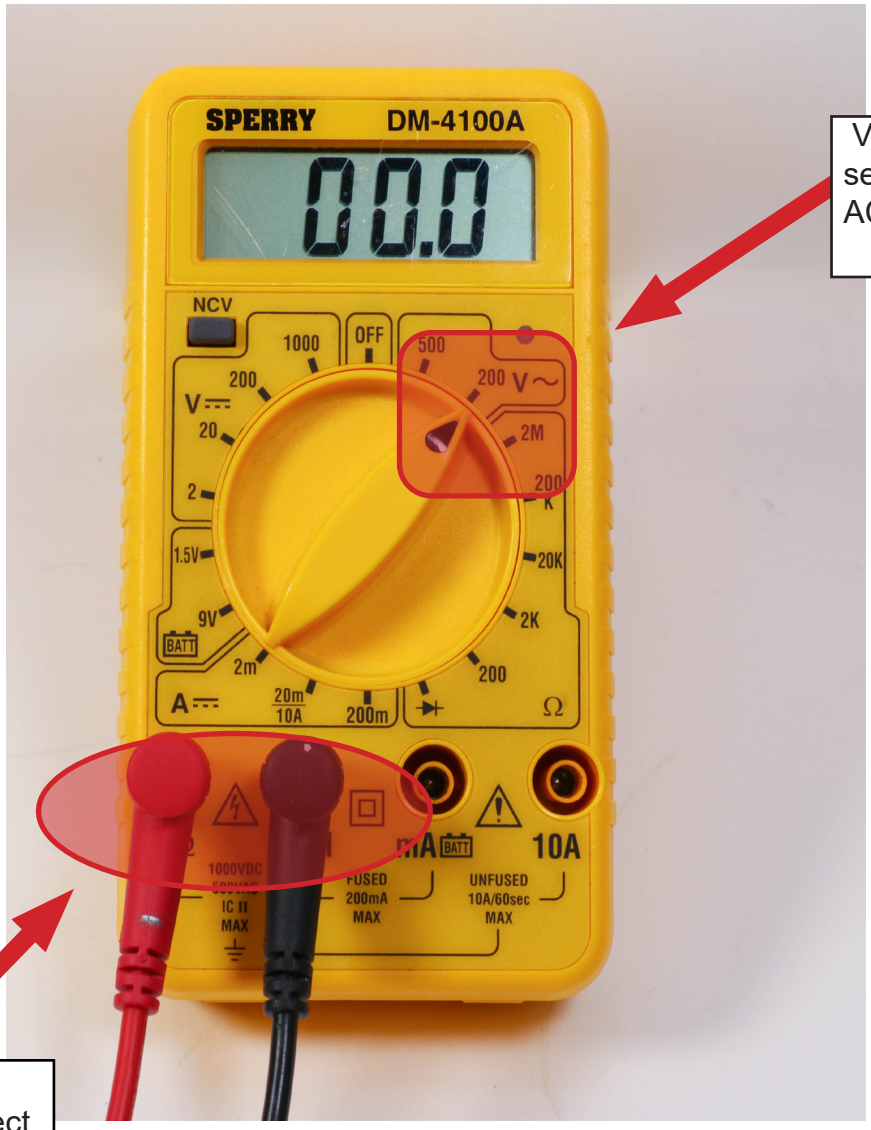
317-885-6330 x3

or online at

www.omnisite.com

6.2 **Setting up the Voltmeter** - To Check Signals you'll need a Volt-Ohm Meter!

The first step is to properly adjust your voltmeter (Figure 1). A voltmeter is shown below. Things to verify is that the voltmeter is set to measure AC voltages and that the terminal leads are in the correct position. The voltmeter will outline where the terminal leads need to be on the device.



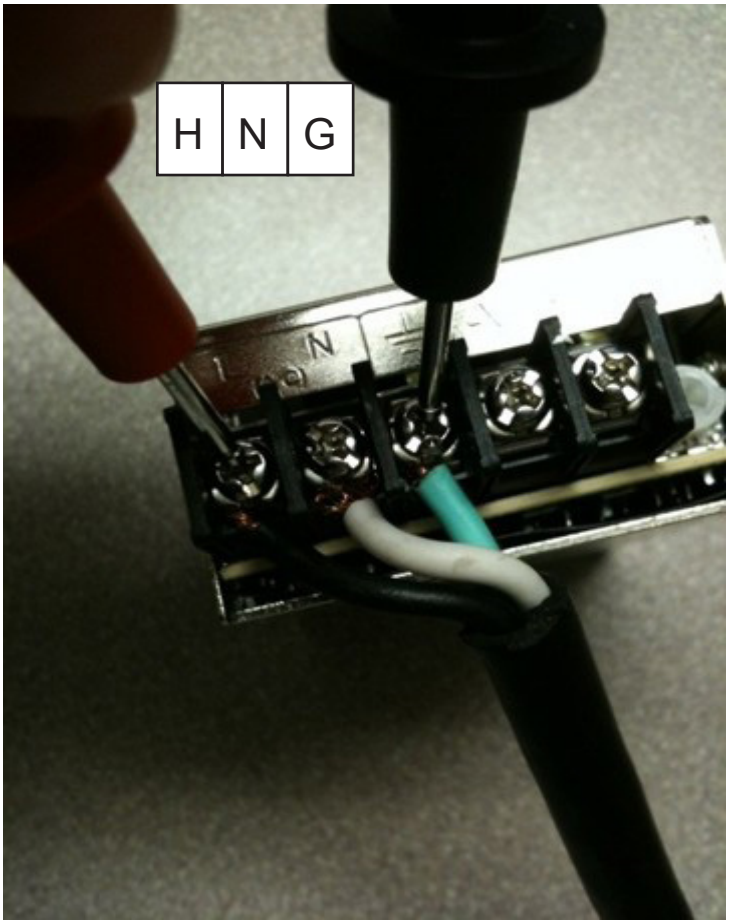
Verify meter is setup to measure AC voltage

Verify Terminal leads are in correct position.

Measuring AC Voltages

You can now use the two terminal leads to measure AC voltages powering your OmniSite Crystal Ball (Figure 2). Use the chart below and verify you are measuring these voltages. If you are not reading these voltages from an AC circuit, there may be an electrical issue inside the panel that should be addressed immediately.

Terminal Positions	Voltage measured
Hot & Neutral	120 VAC
Hot & ground	120 VAC
Neutral & Ground	0 VAC



Black Terminal Lead

Red Terminal Lead

DC Voltages

VDC stands for Volts Direct Current and is different than measuring AC voltage, as there is a (+) VDC and a (-) VDC. Later in this manual, we will cover how to wire Non-Powered contacts. Most Non-Powered contacts utilize Crystal ball onboard power supply. This power supply outputs around 13 volts DC (VDC) to the contact. Understanding DC voltages is important in understanding how to wire Non-Powered contacts using the onboard power supply.

Setting up the Voltmeter

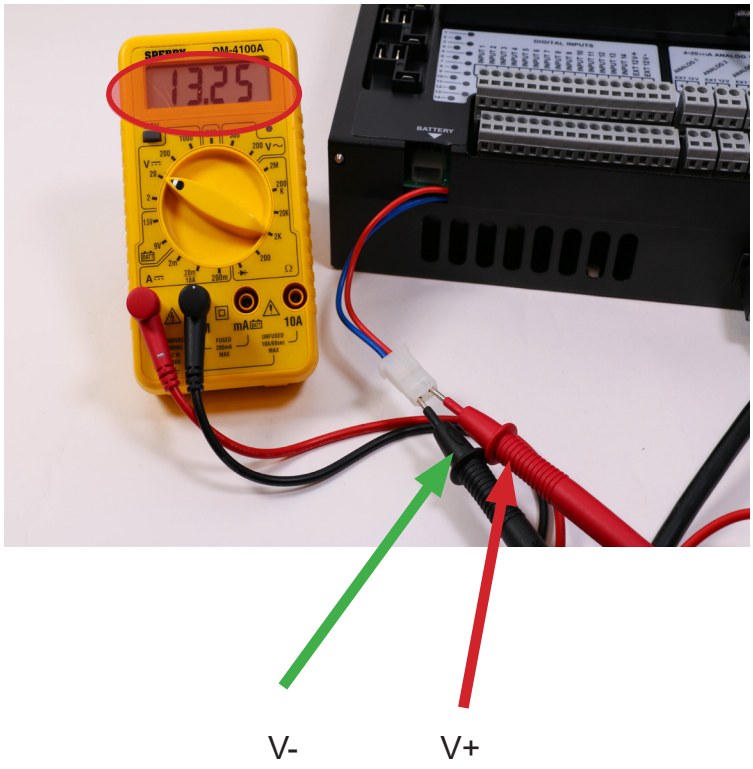
The first step is to properly adjust your voltmeter (Figure 3). A voltmeter is shown below. Things to verify is that the voltmeter is set to measure DC voltages and that the terminal leads are in the correct position. The voltmeter will outline where the terminal leads need to be on the device.

Measuring DC Voltages

You can now use the two terminal leads to measure DC voltages (Figure 4 & 5). Anytime you measure a DC voltage, you should get a positive (+) reading from the meter, when using the red lead for the (+) terminal, and black lead for the (-) terminal. If these terminals are reversed, the meter will read a negative (-) DC voltage.

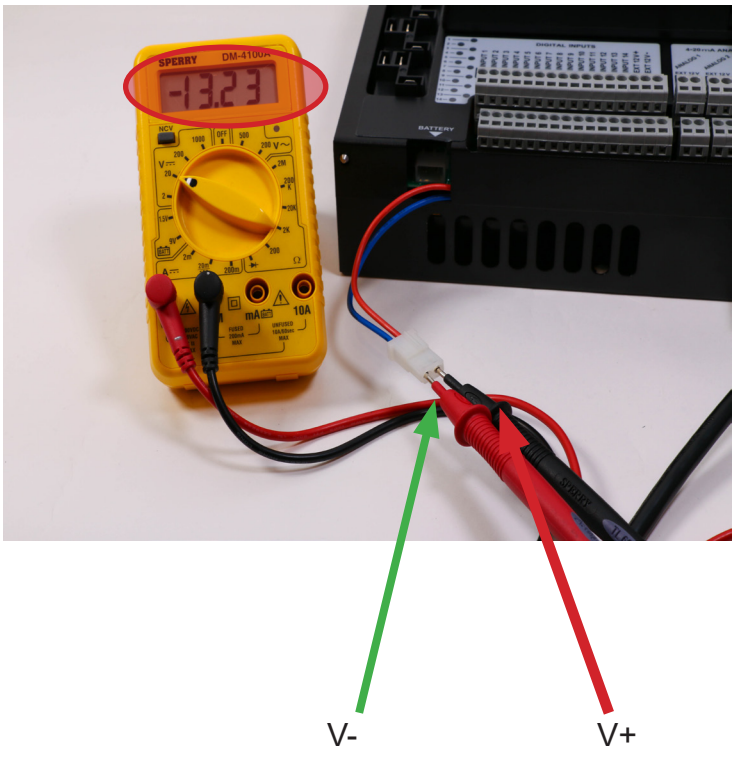
POSTIVE DC READING

Example shown- Testing the Crystal Ball back-up battery voltage. Your battery should read more than 12 volts DC



Red-Red, Black-Black terminal leads. Will receive a (+) VDC reading.

NEGATIVE DC READING

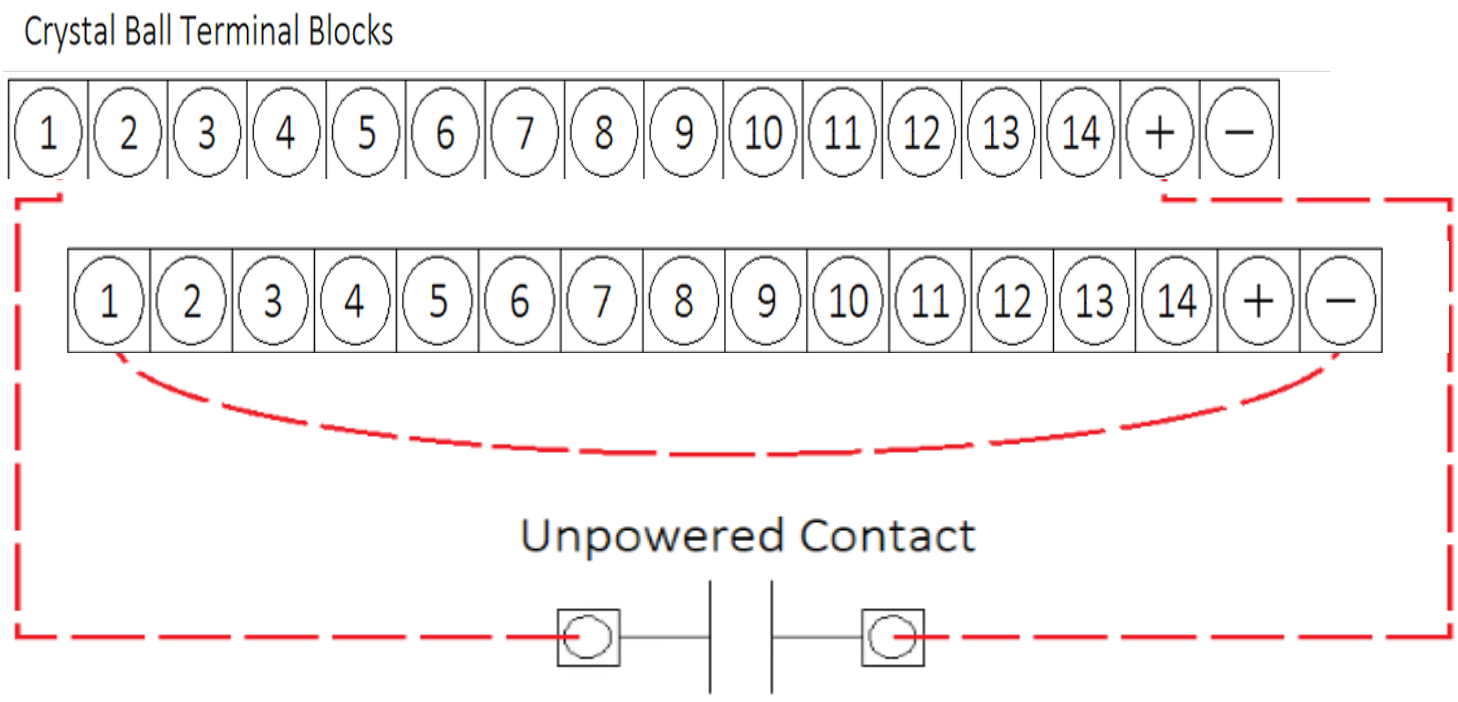


Terminal Leads, polarities reversed. Will receive a (-) VDC reading.

DIGITAL INPUTS- REFRENCE SECTION

UNPOWERED, DRY CONTACTS

Wiring to any NON-POWERED CONTACT- in this example, input 1 is used. The Crystal Ball CANNOT monitor a dry, unpowered contact unless it is wired as shown below.



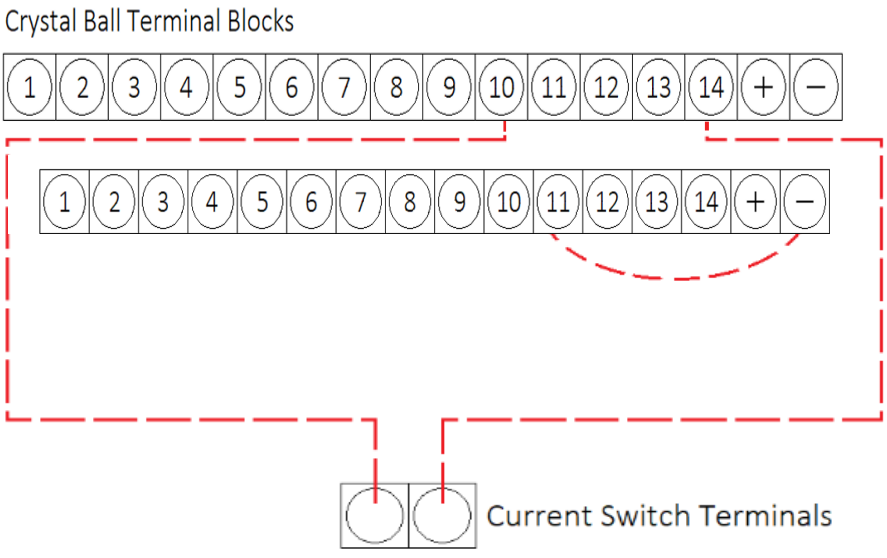
OMNISITE CURRENT SWITCH WIRING

The OmniSite Current Switch can be used to accurately monitor the ON/OFF cycles of a pump. The current switch is a simple solution for accumulating Pump Calculations. Note the current switch is NOT our 4-20mA amp probe

The wiring diagram for the device is shown below. Please keep in mind this is using an XR50 terminal block. For the XR50, inputs 8, 9, and 10 are used for pump runtimes, while with the Crystal Ball, inputs 12, 13, and 14 are used.

*Simply pass any HOT leg of your pump through the current switch.

*Then, wire as shown below:

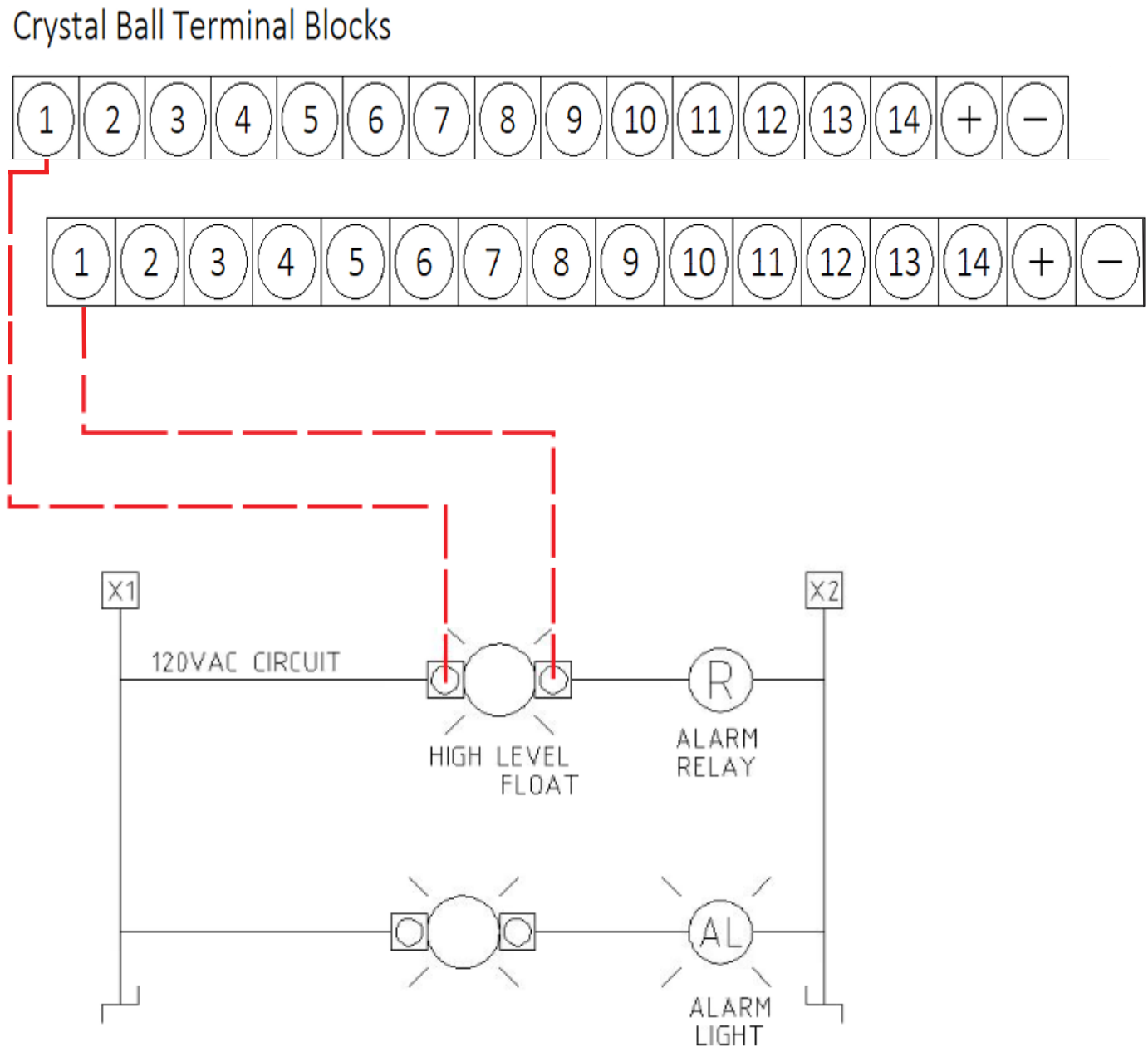


POWERED CONTACTS

Wiring to any POWERED DEVICES – in this example, input 1 is used.

For the control circuit, the following notation is used:

X1 = HOT, 120 VAC
X2= NEUTRAL, 120 VAC

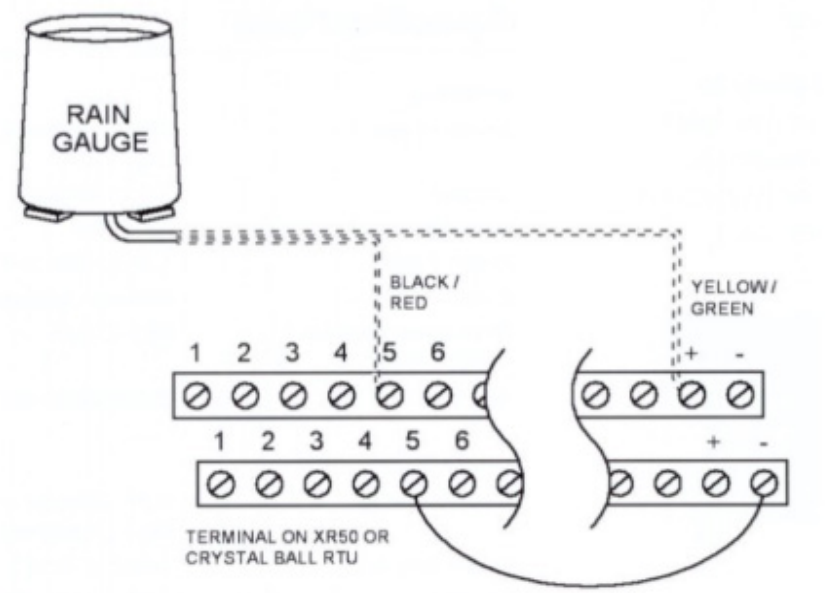


RAIN COLLECTOR

Below explains the steps for setting up a Rain Collector (Part Number: S-MI-RGAUGE).

Setup

1. Before using the rain collector, cut and remove cable tie from tipping bucket located inside rain cone.
2. Cut off the end of the 4-pin modular connector on the modular “phone” cable.
3. Strip the black modular cable back about 4-5 inches and then strip the black, red, green, and yellow cables back about 1 inch.
4. Land the black and red wires into input #5 on the top digital input terminal block.
5. Land the yellow and green wires into the “+” on the top digital input terminal block.
6. Land a jumper wire from input #5 to the “-“on the bottom digital input block.



DO NOT FORGET TO SETUP THE SETTINGS IN THE UNIT:

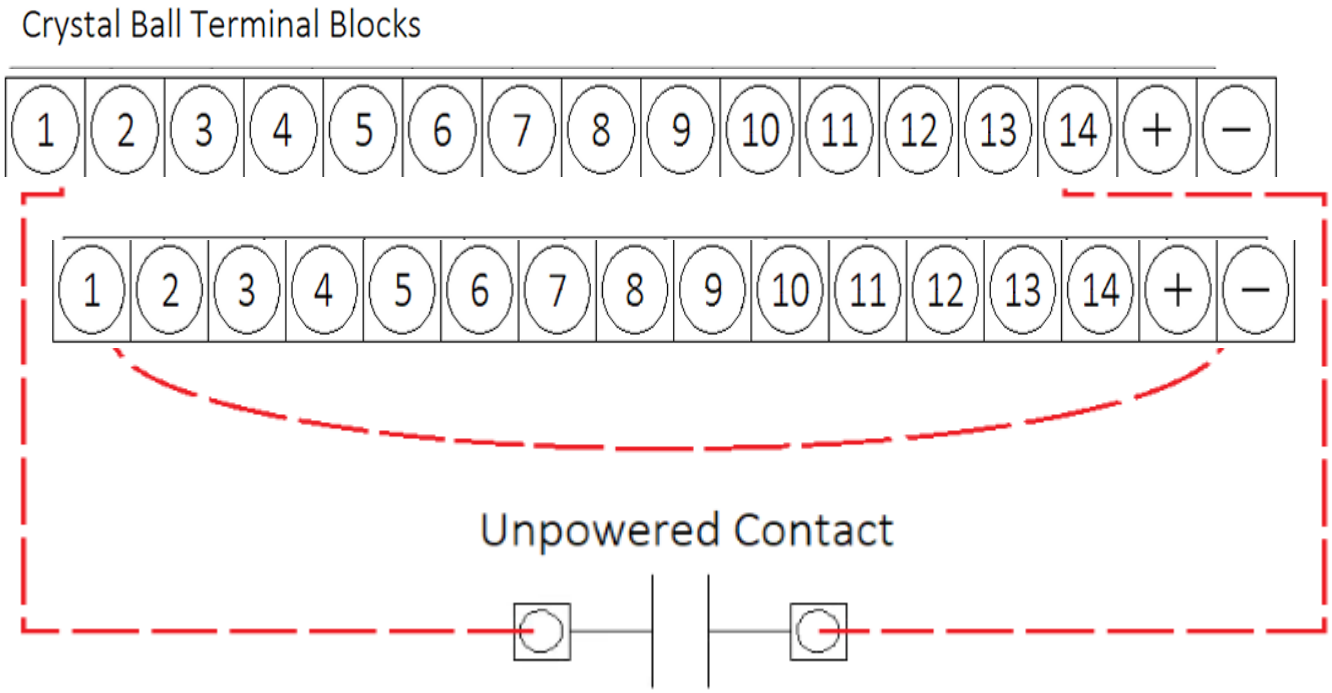
7. You will need to select ENTER SETUP>SETUP DIG INPUTS and then go to INP 5. Next, press ENTER and change the selection to RAIN.

8. To check to see if you have properly hooked up the rain collector, simply flip the teeter totter collector to see if Input #5 LED toggles on & off. You will also want to enable the OmniSite RTU and then go to VIEW INPUTS, scroll down to RAIN PULSES, and verify the totalized rain value is counting up. The Crystal Ball will only accumulate pulses from rain gauges where each pulse = 0.01” of rain

COUNTER SETUP

Below explains the steps for setting up a Counter with an OmniSite RTU. Counters can be configured on inputs 6 and/or 7 of the XR50 or Crystal Ball. Counters require wiring and settings.

First, the counting device must be wired as detailed below:



Unit Settings Configuration:

1. You will need to select ENTER SETUP>SETUP DIG INPUTS and then go to INP 6/7. Next, press ENTER and change the selection to COUNT.

2. To check to see if you have properly hooked up the counter, force the counting device to show a change and see if Input #6/7 LED toggles on & off. You will also want to enable the OmniSite RTU and then go to VIEW INPUTS, scroll down to COUNTER1/COUNTER2, and verify the totalized pulse count value is incrementing.

REFERENCE

Crystal Ball Kit

Comprehensive User Guide

Little Known Fact about Solar Power: If you are planning on using a solar array to power the Crystal Ball, this will obviously have an impact on your installation location. A solar array must have unobstructed sunlight during the day, which means it cannot be partially covered by a leaf shadow, or shadow of any kind. Solar arrays are wired in series, and if any part of it is in a shadow, then the entire array is dead (i.e. not putting out much, if any, power). Therefore, pick your solar panel location wisely, and face it to the south at a 45 degree angle. Also, if you are using solar power you will need to configure the Crystal Ball unit to use its low power mode.The default mode is for the cellular radio to remain powered on at all times when power is applied to the Crystal Ball to allow remote control from the web site. In low power mode, the radio is powered off after 1 minute of inactivity (see how to set low-power-mode in “Appendix A”)

STEP (1) Connect the OmniSite Crystal Ball to the equipment to be monitored using the wiring diagrams in this manual and turn it on.
The monitor will automatically establish 2-way communications over the public cellular network to the www.OmniSite.com web site.

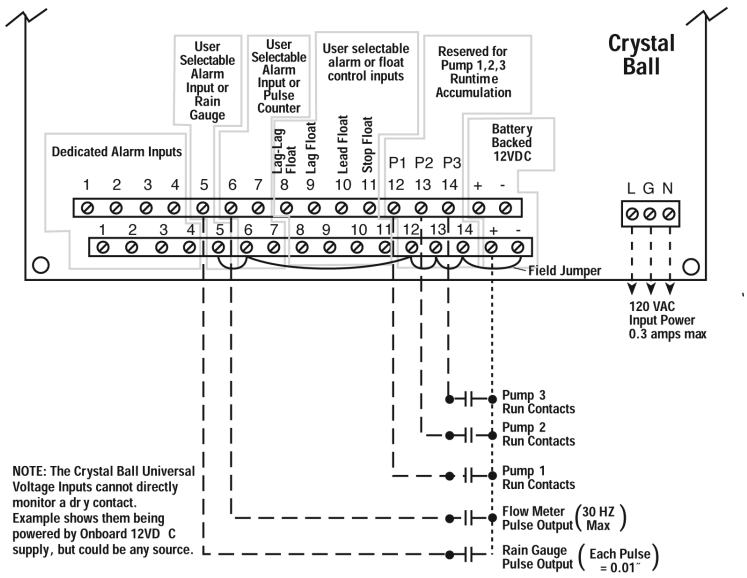
STEP (2) Using the Local Display and Keypad
We have good news for you. If you have physically connected your field wires according to the wiring diagrams in this manual, and you are using the Crystal Ball to merely monitor alarms, and provide pump runtime and on/off cycle information, then there are not any parameters that you have to set with the local display and keypad. The Crystal Ball default settings have been optimized for a typical sewage lift station at our factory, and it is going to work as such.

However, if you are using the Crystal Ball for automatic pump control on a sewage lift station measuring pump amps or using it in a drinking water system. THEN YOU MUST enter set point and control parameters as shown in APPENDIX A -LOCAL PROGRAMMING.

STEP (3) Configuring Your Equipment on the OmniSite Website
Once your installation is complete, configuring your equipment on the OmniSite website is easy:

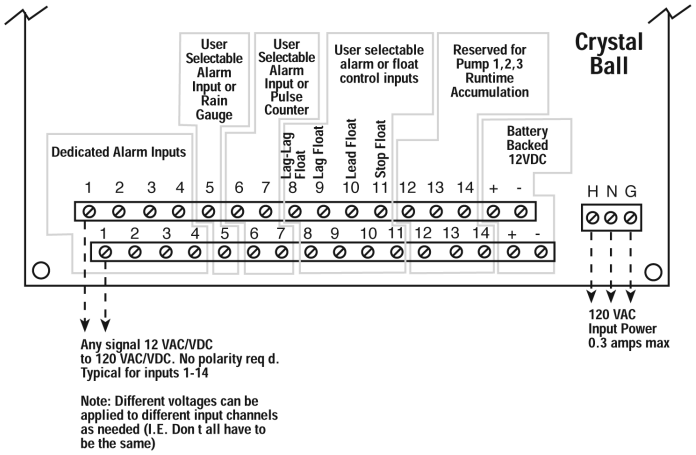
- This is a cellular device like a telephone and has an associated annual cellular service fee. **YOU MUST** contact OmniSite at 317-885-6330 with your billing information or this unit will not transmit alarms. We will activate the cellular service and provide the User ID and Password you will use to sign-on to your secure web pages.
- Sign-on to the OmniSite website at https://guarddog.omnisite.com/login using your newly selected User ID and Password.
- Once signed-on select “Setup” and then “Callout list” and also “Device Setup”.
- Follow the steps on the screen to complete the alarm message delivery.
- OmniSite devices can automatically send emails, text messages and voice calls in any sequence in response to an alarm event. These features are configured using the website interface.
- Helpful hint - If you get stumped use the “Help” link that is at the top of each page. It has very specific information as to how to fill out the form you are currently working-on.
- **Don’t like computers? No problem. OmniSite will set up your alarm for a small fee. Simply call us at 317-885-6330. We will do the setup for you.**

Example - Monitoring Dry, Unpowered Contacts



Wiring Diagrams

The Crystal Ball Field Terminal Strip

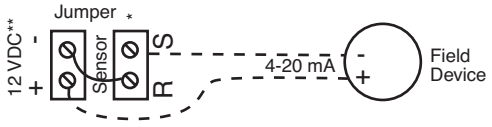


Wiring Diagrams - Cont'd

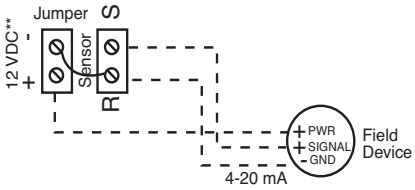
Example Wiring 4-20mA Analog Inputs

* Crystal Ball Analog Input
Impedance = 250 ohms
** 12VDC @ 80mA max, each input

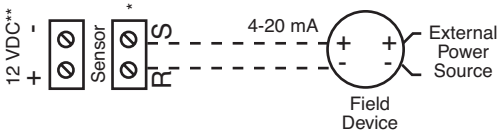
2-Wire Loop Powered



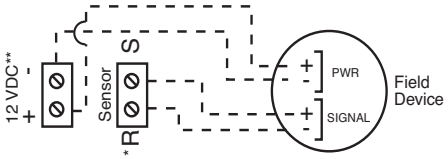
3-Wire Device



2-Wire Self Powered

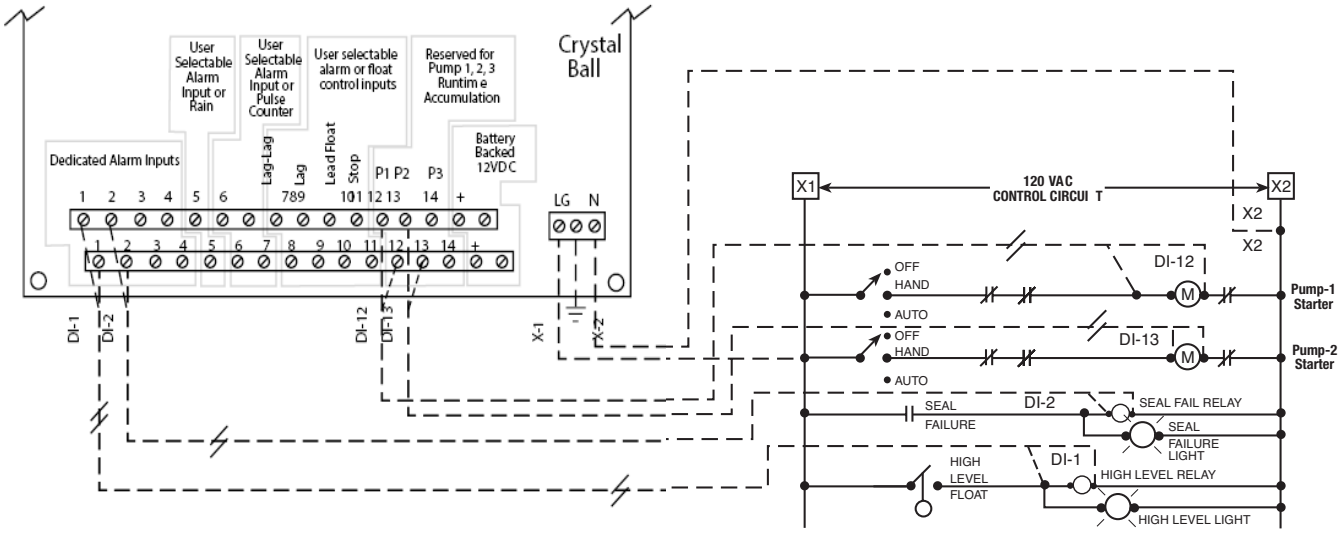


4-Wire Device



Wiring Diagrams - Cont'd

Monitoring a Typical Pump Control Panel



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Crystal Ball Kit
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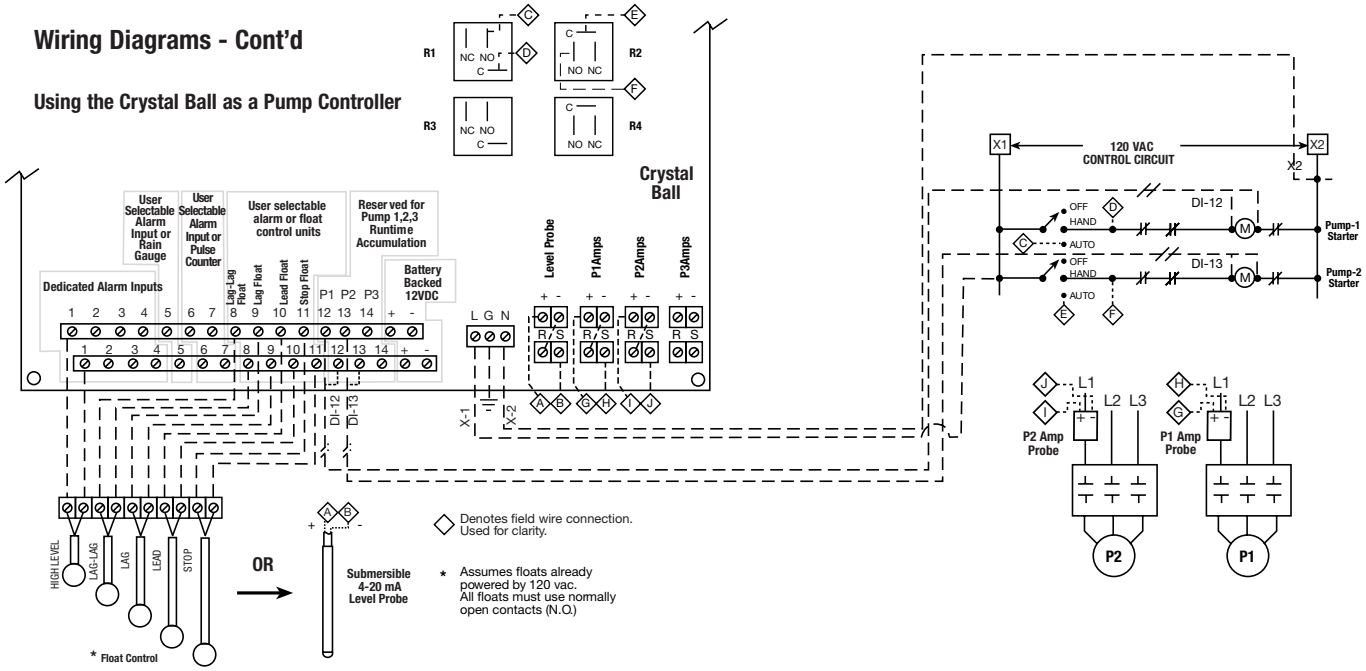
Wiring Diagrams - Cont'd

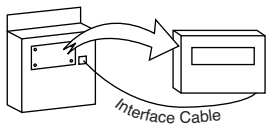
Using the Crystal Ball as a Pump Controller



Quickstart Guide for Using the Crystal Ball as Your Primary Pump Controller

1. The Crystal Ball can be mounted outside of your pump control panel using the optional OmniSite NEMA 4x enclosure.

2. Alternately, the Crystal Ball can be mounted inside of a new pump control panel (as room allows), and the removable display of the Crystal Ball can be mounted on the face of your inner swing-out door as follows:



Note: Display is not waterproof and should not be mounted directly outdoors

3. The Crystal Ball has (3) options for pump control:
   - Float-only control
   - 4-20 mA Analog level control
   - 4-20 mA w/ float backup control

4. If using "float only" control, then wire as shown in diagrams. on pages 15,16 of this manual. Note: the diagram in this manual on P15 assumes your floats are powered by an external 120 VAC source. If not, and the Crystal Ball will be supplying the power to floats, then wire your floats as show on page 10 of this manual titled " Example - Monitoring Dry, Unpowered Contacts"

If using float-only control they should be wired as follows:

Pump-3	LAG-LAG Float	Input 8
Pump-2	LAG Float	Input 9
Pump-1	Lead Float	Input 10
All Stop	Stop Float	Input 11

5. If using analog-only control, then connect your 4-20 mA device to Analog input #1 (only!) according to the diagrams on pages 11 & 12 of this manual.

6. If using Analog plus float backup control then wire your analog device as detailed in step 5 above, then wire your high level float to input #1, and your stop float to input #11. The analog float backup uses only (2) floats and works as follows:
   - If your analog signal drops below 3 mA or above 22 mA, it is assumed the signal has "failed".
   - If the analog has failed, and the high float is energized, then the lead pump is started. If 15 seconds elapses and the high float is still energized, then the lag pump is started. If 15 additional seconds elapses, with both pumps running, and high float is still energized then the final pump is started.
   - All pumps will run (i.e. however many were started) until the stop float is de-energized.
   - This process will repeat until the analog signal is repaired.

7. Relay Outputs - Note that the Crystal Ball relay outputs are "pre-assigned: as follows:
   - Relay-1 Pump-1
   - Relay-2 Pump-2

- Relay-3 Pump-3
- Relay-4 Spare-for custom use

8. Once your wiring connections are made, you HAVE TO enter the following setup parameters using the Crystal Ball local keypad:
   - Number of Pumps being controlled
   - Your pump start/stop setpoints (if using analog sensor)
   - Type of tank level measuring device you are using (i.e. floats, or analog, or analog w/ float backup)
   - Pump GPM rating
   - Tank Dimensions

   Refer to Appendix A for Crystal Ball Menu Tree and how to navigate to the settings above.

9. When finished, test your setup using the Crystal Ball dedicated "Level Test" button. This button only works if you are using analog-only or analog with float backup control. If you are using Floats-only, then the best way to test your setup is just manually "tip-up" each float as needed.

10. Note that if you are measuring pump amps with the Crystal Ball, then the amp probes must be connected as follows:

Analog-2	Pump-1 amp probe
Analog-3	Pump-2 amp probe
Analog-4	Pump-3 amp probe

Crystal Ball Field Input/Output Circuit Functionality

INPUT	DESCRIPTION
(Inputs 1 thru 4)	Connection of any "ON/OFF style" voltage signal in the range of 12VDC or 12 VAC thru 120 VAC or 120 VDC can be connected directly to these input circuits to monitor alarm signals (pilot lights, relays, coils, etc). No polarity has to be observed on these inputs, and different inputs can have different polarities/voltages. All alarm inputs have user adjustable alarm time delays adjustable thru the local display/keypad.
(Input 5)	Connection of any "ON/OFF style" voltage signal in the range of 12VDC or 12 VAC thru 120 VAC or 120 VDC can be connected directly to this input circuit to monitor alarms (pilot lights, relays, coils, etc). No polarity has to be observed on this input. All alarm inputs have user adjustable alarm time delays adjustable thru the local display/keypad. Alternatively, this input can monitor and totalize pulses from a rain gauge (used to plot rainfall vs. well inflow rate)
(Inputs 6 and 7)	Connection of any "ON/OFF style" voltage signal in the range of 12VDC or 12 VAC thru 120 VAC or 120 VDC can be connected directly to these input circuits to monitor alarms (pilot lights, relays, coils, etc). No polarity has to be observed on these inputs. All alarm inputs have user adjustable alarm time delays adjustable thru the local display/keypad. Alternatively, these inputs can monitor and totalize pulses from a pulse output device at a max. rate of 30Hz (used to read flow and electric meters)
(Inputs 8 thru 11)	Connection of any "ON/OFF" style voltage signal in the range or 12 VDC or 12 VAC thru 120 VAC or circuits to monitor alarms (pilot lights, relays, coils, etc.) No polarity has to be observed on these inputs and different inputs can have different voltage/polarities. All alarms have user adjustable alarm time delays thru the local display/keypad. Alternatively, these inputs can be user selectable to monitor float switches and provide pump control using the relay outputs on the controller. If float control is desired – must be configured as shown in APPENDIX A – local programming.
(Inputs 12 thru 14)	These inputs are reserved to monitor the coil or auxiliary contacts from Pump-1,2, and 3 motor starters. Connection of any "ON/OFF style" voltage signal in the range of 12VDC or 12 VAC thru 120 VAC or 120 VDC can be connected directly to these input circuits to monitor the pump run status. No polarity has to be observed on these inputs. These inputs provide daily reports of Pump-1,2,3 on/off cycles, total runtime, and GPM using timed draw downs on the well, as well as total station flow without the need for a flow meter. (Note: Flow calculations DO NOT work on stations using variable speed drives, and note that inputs 12,13,14 must be used with normally open contacts to correctly accumulate runtime (e.g. voltage is applied to input 12,13, or 14 when the respective pump is running)
Analog inputs 1-4	Connection of any 4-20mA device signal allows remote monitoring and alarm set point notification.
Relay outputs 1-4	Connect to automatic control circuit of pump motor starter to provide automatic pump-up (drinking water applications) or pump-down (sewage lift stations).
(+ and - Terms)	These terminals supply a continuous, battery backed 12 VDC to any dry un-powered contacts providing alarm monitoring in the absence of AC power.

Crystal Ball Kit
Comprehensive User Guide

Appendix A - Local Programming

Easily navigate the Crystal Ball display as follows:

- 8-button Interface
- Display is Liquid Crystal Display 4 x 20
- While working through menu structure:
  - Pressing UP or DOWN will select the next or previous menu item in the list. To select that item, press ENTER If the item is a menu selection, the next menu will open. If the item is a value, then it is selectable to edit.
  - Pressing EXIT for 2 seconds will return the user to the main menu.
  - Pressing EXIT momentarily will return the user to the previous menu.
- While editing a value:
  - If the value is numeric, the cursor will blink on the digit being edited.
  - If the value is a list, the list selection will blink. UP and DWN will be used to scroll through the list or make edits.
  - EXIT will cancel any editing WITHOUT saving the changes.
  - ENTER will move the cursor to the next position. If currently editing the last position or a list value, the value is SAVED and the user returns to the menu mode.
- Use of Dedicated Function Keys
  - Pressing “Level Setup” brings the user directly to the pump on/off setpoints for editing or review when using pump control.
  - Pressing “Level Test” brings the user directly to the simulation screen that allows the user to use the UP/DOWN keys to simulate a rising and/or falling liquid level. This is used to test pump start/stop set points and alarm limits.
  - “Pump Bypass” is used to take a pump out of automatic alternation if it is shut off for service or repair. Taking it out of rotation also prevents false alarms from occurring each time the Crystal Ball attempts to start the failed pump, and it fails to run. Through this menu option it is also possible to manually turn an output on or off.

Holding EXIT for 2 seconds can be pressed at any time to return to the main menu.

NOTE: The Crystal Ball RTU must be disabled with the Intelligent ID key before setup changes can be made. When finished with setup, again use your Intelligent ID key to put the Crystal Ball RTU back into service.

Crystal Ball Menu Tree

1) Need Help? → Call OmniSite Ph. 317-885-6330 Or go online: www.omnisite.com

2) View Inputs →
1) Analog 1 (-----/0-9999)
2) Analog 2 (-----/0-9999)
3) Analog 3 (-----/0-9999)
4) Analog 4 (-----/0-9999)
5) Input 1 (ON/OFF)
6) Input 2 (ON/OFF)
7) Input 3 (ON/OFF)
8) Input 4 (ON/OFF)
9) Input 5 (ON/OFF)
10) Input 6 (ON/OFF)
11) Input 7 (ON/OFF)
12) Input 8 (ON/OFF)
13) Input 9 (ON/OFF)
14) Input 10 (ON/OFF)
15) Input 11 (ON/OFF)
16) Pump 1 (ON/OFF)
17) Pump 2 (ON/OFF)
18) Pump 3 (ON/OFF)
19) Output 1 (ON/OFF)
20) Output 2 (ON/OFF)
21) Output 3 (ON/OFF)
22) Output 4 (ON/OFF)
23) Rain Pulses: (---/0-99)
24) Counter-1: (---/0-9999)
25) Counter-2 (---/0-9999)
26) P1 GPM: (0-2000)
27) P1 Runtime: (hrs:mins)
28) P1 Starts: (0-999)
29) P1 Drawdwn: (hrs:mins)
30) P1 Amps: (0-999)
31) P2 GPM: (0-2000)
32) P2 Runtime: (hrs:mins)
33) P2 Starts: (0-999)
34) P2 Drawdwn: (hrs:mins)
35) P2 Amps: (0-999)
36) P3 GPM: (0-2000)
37) P3 Runtime: (hrs:mins)
38) P3 Starts: (0-999)
39) P3 Drawdwn: (hrs:mins)
40) P3 Amps: (0-999)
41) Well Fill: (mins:secs)
42) Inflow Rate: (0-99999)

- **Key:** (range or options; default)
- **View Inputs:** Use this menu option to view all connected equipment and operational status since the RTU last reported to your web page.

3) Pump Control →

1)Pump Settings →
1) Sensors: (NONE, 4-20mA+FLT, 4-20mA, FLOATS; NONE)
2) # of Pumps: (00-03; 00)
3) Grease Cntrl %: (00-10; 00)
4) Alternate? (YES/NO; YES)
5) Pump Scheme: (DOWN/UP; DOWN)
6) Pump Fail Alm? (YES/NO; YES)
7) Control Only? (YES/NO; NO)
8) SETUP ANALOG INPUTS

ANALOG INPUT 1 →
1) Decimal Pos: (xxxx, xxx.x, xx.xx; xxxx)
2) Scaling 4mA = (0-9999; 0)
3) 20mA = (0-9999; 200)
4) Low Alarm: (NONE/0-9999; NONE)
5) High Alarm: (NONE/0-9999; NONE)
6) Dead Band: (0-9999; 0)
7)
8) Alarm Delay: (0-240 sec; 5 sec)
9) Report Value: (LAST/LIVE; LAST) *On
AI#1 LIVE is the only option

ANALOG INPUT 2
ANALOG INPUT 3 — same menus as Analog Input 1
ANALOG INPUT 4

2) Pump Bypass →
1) P1 runs? (YES/NO; YES)
2) P1 control: (AUTO, ON, OFF; AUTO)
3) P2 runs? (YES/NO; YES)
4) P2 control: (AUTO, ON, OFF; AUTO)
5) P3 runs? (YES/NO; NO)
6) P3 control: (AUTO, ON, OFF; OFF)
7) Output 4: (ON/OFF; OFF)

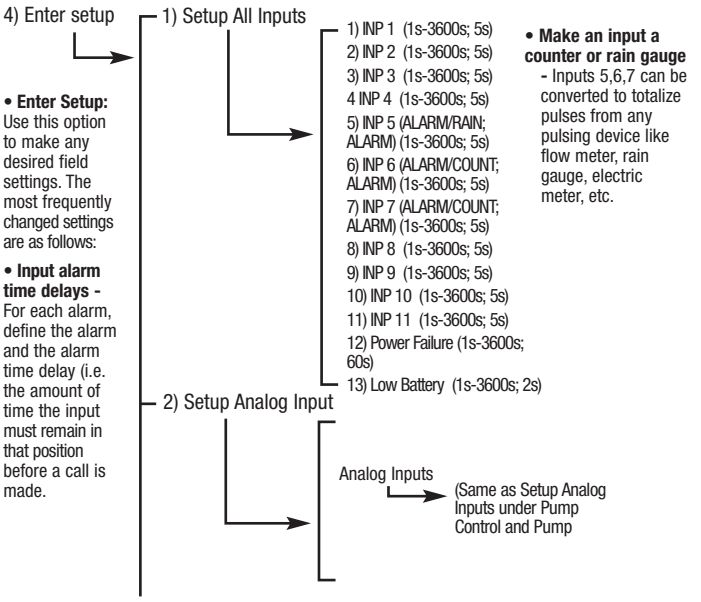
3) Level Setup →
1) Stop Level: (0-9999; 0)
2) Lead Level: (0-9999; 0)
3) Lag Level: (0-9999; 0)
4) Lag-Lag Level: (0-9999; 0)

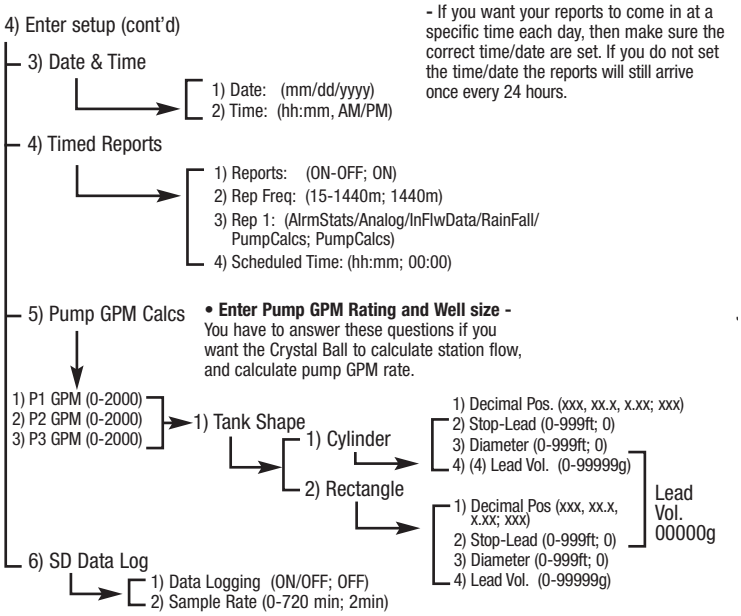
4) Level Test →
1) P1: (ON/OFF; OFF) P2: (ON/OFF; OFF)
2) P3: (ON/OFF; OFF)
3) Tank Lvl (0-9999; 0)
4) Press Up/Down (just directions to change tank level above)

If you are using the Crystal Ball to control pumps based upon tank level, then you must answer the questions in this section of the menu tree to enable pump control.

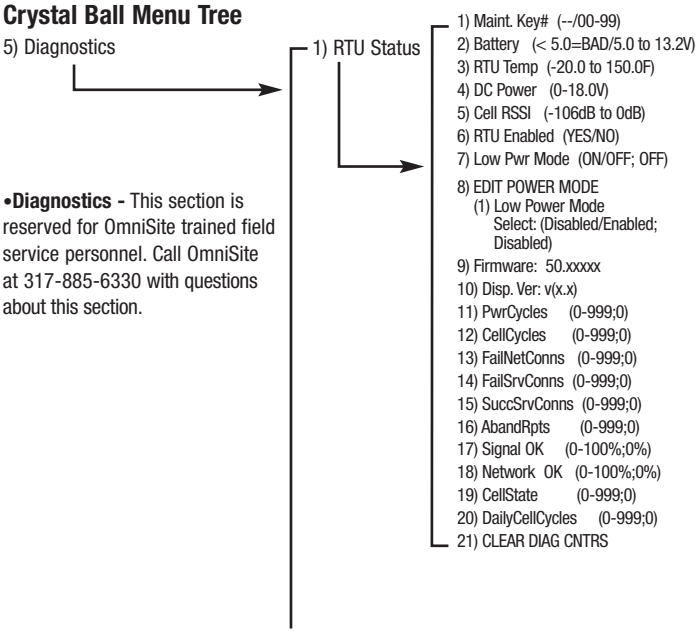
Crystal Ball Kit
Comprehensive User Guide

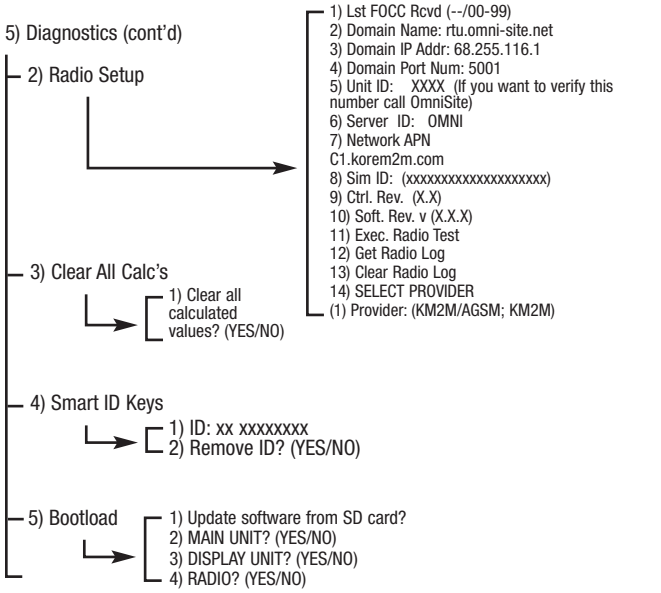
Crystal Ball Menu Tree





Crystal Ball Menu Tree





Appendix E - Location for Setting Software Parameters

Process	Unit	Website
Enter input time delays	√	
Enter wet well dimensions	√	
Enter datalogging parameters	√	
Enter pump controller settings	√	
Enter analog high/low set points	√	
Enter analog measuring range	√	√
View current pump calculations & counter readings	√	√
View current analog/digital input status	√	√
Setup GPM override		√
Setup recipient email, phone and text information		√
Setup call-out list order and delays		√
Setup alarm state for inputs		√
Setup notification events		√
View charts, graphs and export data		√
View logs and history		√
Analyze inflow and rainfall		√

Place the maintenance key up tp the "access Key" to ENABLE/DISABLE the unit

You can use the maintenance key to enable/disable the unit to eliminate false alarms while working on pumps, as well as time/date stamp when someone arrives onsite/leaves the site, to fix an alarm situation

FREEBIES

FREEBIE ZONE

Snag Your Perks!

From custom merch to surprise goodies we're always dropping new freebies just for you.

Wanna see what's up for grabs right now?
Scan the QR code below to see the full list of what's available this month!

Featured Freebies

- Tote bags
- T-shirts
- Safety Glasses
- Travel mugs
- GuardDog Stress Toy
- ...and more suprises

SCAN HERE
TO SEE WHAT``S AVAILABLE!

How To Claim

1. Scan the QR Code
2. Chose the Freebie of your choice
3. Submit Form

Are OmniSite Products Right for You?

Our cloud-based software removes the need to buy, install, manage, and maintain custom software. Instead, you simply login to our GuardDog platform that is available 24/7 via our web or mobile app. We utilize reliable cellular technology to deliver your important alerts, so there is no need to run dedicated phone wires to your equipment. In summary, we offer cost-effective and reliable solutions to your water monitoring needs.

Instead of being all things to all people, at OmniSite we decided it was most important to focus our energy on becoming leading experts in what we do - monitoring water/wastewater. If you have a unique need or process that our products don't meet, we are happy to provide you with recommendations using our knowledge of alarm monitoring.

COST-CUTTING EQUIPMENT

OmniSite monitoring equipment gives you the overall best value for your cellular alarm monitoring needs. Our cloud-based software allows you to track all your pump stations online or on the mobile app without the investment in additional infrastructure like servers or dedicated IT experts. We take care of that for you. Unlike SCADA systems and other expensive equipment, OmniSite products are a solution to your exact application without the costly price tag. We pride ourselves in helping our customers cut costs without sacrificing reliability and other features they value.

ANYWHERE ACCESS

Because OmniSite products work off of the cellular network, you can receive important alerts anywhere via call, email, or text. OmniSite devices do what you can't - they monitor 24 hours a day, 7 days a week. With a web interface and mobile app called GuardDog, OmniSite can be compared to most SCADA systems as we are equipped to offer data logging, reporting, remote commands, immediate alerts upon detection, and more. With settings that allow you to receive status reports as frequently as every 15 minutes and alarms instantly, you can relax knowing you will always be informed. Need an instant update on if a station is functioning normally? OmniSite products make it easy with a simple command option that will send you a real-time update.

RESPECTED & RELIABLE

OmniSite is consistently regarded as a leader in our industry. We are a small, family-owned company that understands the importance of treating all of our customers as if they are our only customer. Our products can have a big impact on the environmental health, so we are dedicated to being the most reliable solution with the best customer support available. OmniSite has been in business for over 20 years thanks to our loyal customers.

EASY INSTALL, EASY USE

OmniSite products are more user-friendly and easier to install than alternative options. Not every application needs an expensive and complex SCADA system. Our products are simple but offer features that are important to you like access to reporting through GuardDog, our web and mobile app-based platform.

OmniSite Product Comparison Chart

Whether you're looking for a low-cost solution to meet compliance guidelines, or need a monitoring device with built-in pump control options, OmniSite has a product for all your pump station needs.

	 OmniBeacon	 XR50	 Crystal Ball
Digital Inputs	2	10	14
Analog Inputs	NO	NO	4
Relay Outputs	NO	NO	4
Backup Battery	YES	YES	YES
LCD Display	NO	2 Line X 16 Characters	4 Line X 20 Characters
Can Be Purchased with a NEMA 4X enclosure	N/A	YES	YES
Can Be Mounted Directly in the Panel	Mounts on Top or Side of Panel	YES	YES
Sends Real-Time Alerts via Text, Email, or Call	YES	YES	YES
Eligible for Elite Reporting	NO	YES	YES
Provides Access to Pump Data (GPM, Runtimes, On/Off Cycles, Rainfall, Pump Failure, etc.) via GuardDog	NO	YES	YES
Eligible for OmniAdvantage Plan	YES	YES	YES

Do You Really Need a SCADA System?

Depending on the size of your treatment plant, municipal budget, and individual needs, a SCADA system might be in fact overkill. OmniSite offers an affordable alternative with real-time alerts, daily data reporting with the option to upgrade to every 15 minutes, and simple, easy-to-use units that communicate with you through reliable cellular networks. So the question remains: do you really need a SCADA system? Still on the fence? Below is a breakdown of how OmniSite compares to SCADA.

SCADA IS EXPENSIVE

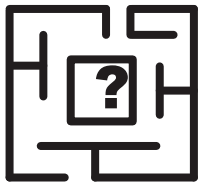
SCADA systems have high fees associated with installation and maintenance. Add in bidding for companies to install it, annual data fees, and cost of massive, expensive hardware, and your price tag has increased exponentially.

OmniSite uses tiny data packets through cellular networks to deliver you data quickly and affordably. Plus our annual cost for cellular service has not increased in over a decade.

SCADA IS HIGH MAINTENANCE

SCADA systems have many interconnected parts and pieces. If something breaks it can be difficult to locate the faulty part. This puts your treatment plant at risk and behind schedule until the problem can be located and fixed.

OmniSite units are simple by design. Plus, with our new OmniAdvantage Plan subscription, if something breaks, send it in and we'll test it and fix it for you.



SCADA IS COMPLICATED

SCADA is a massive, complicated system designed for the likes of major cities such as Chicago and New York. It's unrealistic to force your municipality to pay for and utilize the exact same complex system for a much smaller scale.

OmniSite is unit independent, meaning for however many pump stations you need monitored, that's how many units we provide. No more. No less. Only exactly what you need.

SCADA HAS EXTERNAL SOFTWARE

SCADA is such a massive system that all the software required to fully utilize it doesn't come in one, easy to use package. This means software set up and updates from multiple, hard to track, sources.

OmniSite's state-of-the-art software comes FREE with every device purchase. Plus, our GuardDog mobile app allows you to have access to your data whenever, where ever.

OmniSite 203 W. Morris Street Indianapolis, IN 46225 | 317-885-6330 | www.omnisite.com

Do You Really Need a SCADA System?

SCADA VS OMNISITE COST CALCULATOR

Due to the impactful cost of installing a SCADA system, it can be wise to examine the expense of other options by comparison. Below is a chart showing the 10 year installation and operating costs of 15 units on an SCADA system verses OmniSite units. You'll be surprised how much the savings add up. Want to see estimated cost of a different number of units? Try our online Cost Savings Calculator at OmniSite.com

SCADA 10 Year Cost on 15 Units	
Hardware Cost	$5,000/station
Custom Panel Design/Build	$2,800/station
Software Cost	$800/station
Installation & Start up Cost	$1,250/station
Cost for System Engineering	$10,000
Procurement Cost main PC/Server	$5,000
Cost of Programming MMI Software	$2,500
Annual Budget for Server PLC Hardware, Software Upgrades, & Installation	$12,500
Other charges, fees, bids, consultations, budgetary meeting expenses, etc	$25,000
Total First Year Cost on 15 Units	$247,750
9 Years of Maintenance	$185,400

TEN YEAR TOTAL COST ON 15 UNITS

$433,150

OMNISITE 10 Year Cost on 15 Units	
Material & Installation Labor	$3,500/unit
Annual Cell/Telemetry Cost	$290/unit
Total First Year Cost on 15 Units	$56,850
9 Years of Cell/Telemetry Fee	$39,150

TEN YEAR TOTAL COST ON 15 UNITS

$96,000

TOTAL FIRST YEAR SAVINGS ON 15 UNITS

$190,900

TOTAL 10 YEAR SAVINGS ON 15 UNITS

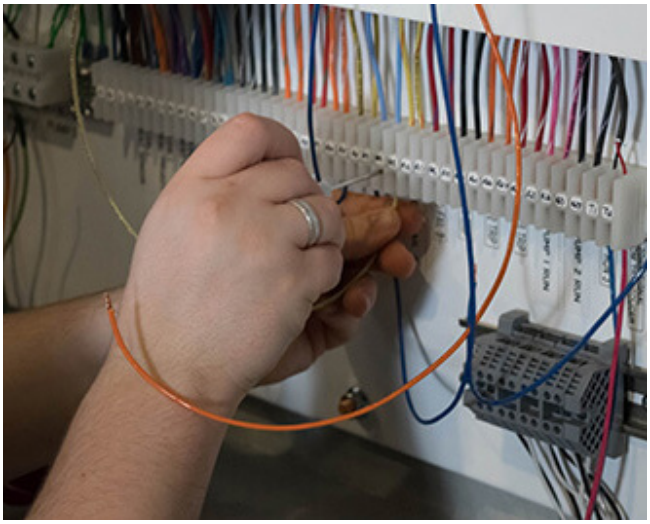
$337,150

OmniSite Training

OmniSite offers a comprehensive training course that covers the many aspects of installing OmniSite products, configuring alarms, and monitoring day-to-day activity. Training is hosted in our state-of-the-art Training Center, where we incorporate OmniSite devices into real-world control panels. The hands-on environment allows trainees to learn and work with real wastewater equipment so they are properly prepared to work with OmniSite devices in the field.

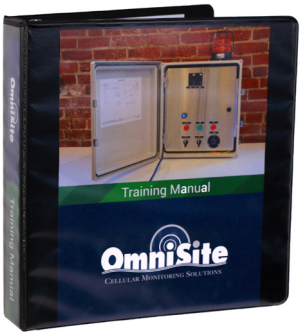
About the Program

Our training program was designed with you in mind. Our hands-on labs, with a real pump station and quality instruction from OmniSite experts, will help you become a pro at using our products. The two-day course will allow new and familiar installers to gain valuable knowledge about the following subjects:



- Wiring of XR50, Crystal Ball, and OmniBeacon
- Step-by-step process of how to install an OmniSite unit
- Product activation
- Troubleshooting in the field
- GuardDog web- and mobile-interface training
- New product training

Attendees will engage in a tour of the OmniSite facility where students can see how our products are made and prepared for shipment. Additionally they'll receive lunch each day plus dinner the first evening.



Take-Home Training Materials

Each attendee will receive a detailed, take-home training manual that contains product information, multiple step-by-step labs, control wiring overviews, troubleshooting information, and more.

Contact sales@OmniSite.com to register today!

OmniSite Training

Training Where You Are With Free Webinars

OmniSite provides webinars covering topics to help both customers and sales representatives. These webinars are designed to give a better understanding of OmniSite products, tools and services.

Each webinar is held online with an OmniSite expert facilitating the session. Each individual attending has the ability to interact with the instructor to ask questions and voice concerns.

Webinar Topics We Cover

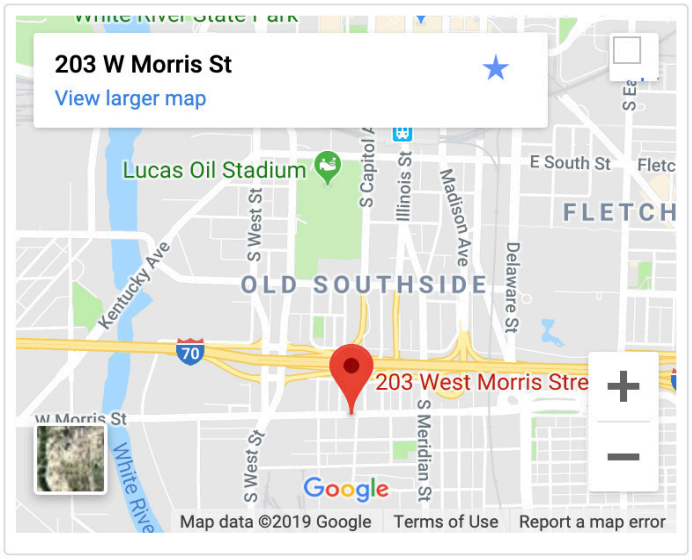
- GuardDog Overview
- Activations and the Activation Wizard
- Product Overview
- Additional Topics by Request

From Out of Town?

Our facility is located in downtown Indianapolis, just a short drive from the Indianapolis International Airport and within 10-20 minutes of several hotels.

Attendees are responsible for the following travel expenses:

- Airfare
- Car rental/gas
- Hotel
- Additional meals
- Entertainment



Downtown Indy Hotel and Restaurant Recommendations

Hotels			Restaurants	
Staybridge Suites	$	(317) 536-7500	Tavern on South	(317) 602-31155
Hampton Inn	$$	(317) 261-1200	Iozzo's Garden of Italy	(317) 974 110
HomeWood Suites	$$	(317) 636-7992	Slippery Noodle	(317)631-6974

PRODUCT SAFETY, USE, AND LIMITED WARRANTY

The following safety and use information and Limited Warranty applies to products sold by OmniSite ("OmniSite") to you the end-user ("You") on OmniSite namely an alarm with text notification capability, related accessories such as sensors (collectively "Products"), and cellular service, which is required in order for the alarm to send notification text messages ("Services" collectively with Products "Products and Services").

Product Safety and Use Information
IMPORTANT: Use only supplied battery and with your Products. Routinely check the battery in Products; failure to routinely check the battery may result in the failure of Products to function during a loss of power. Routinely check the strength of the cellular signal to Products and/or perform tests to check the text notification capability of the Products. WARNING: Products use electricity in the presence of water; therefore, your safety and the safety of others depend upon you thoroughly reading and understanding the Installation Guide. If you have questions or do not understand the information presented in the Installation Guide, please call 1-317-885-6330. Be sure that electrical cords used are not frayed or placed in a location where they can pose a danger. To reduce the risk of fire, electric shock, injury or death, always disconnect all sources of electrical power before servicing or cleaning; do not touch the electrical terminals or controls with wet hands; and do not tilt, jolt or tip Products while powered-on. Never disassemble Products. Never allow children to use Products.

Product Safety, Use & Limited Warranty
CAUTION: Products are cellular devices and must be activated before use. Please visit OmniSite.com/activate to activate your Products. You must have a cellular device in which to communicate with Products. OmniSite utilizes automatic bill pay as a convenience to its customers and to ensure continuity of cellular service. OmniSite will notify you before cellular service is to be renewed and before the credit card you provided during activation is charged. If OmniSite is not able to successfully bill for the cellular service, OmniSite has the right to immediately disconnect cellular service to your Products and your Products will no longer send text notifications. NOTE: Upon delivery inspect contents immediately and file claim with delivery carrier for any damage. OmniSite recommends saving the original box and packing material. You are responsible for damage to Products if returned to OmniSite improperly packed. NOTE: OmniSite's primary method for contacting you is via email. Please add us as a contact to ensure delivery of these emails. Please promptly update your email address with us if it changes.

LIMITED WARRANTY: OmniSite ("OmniSite") warrants to You that Products will be free from defects in materials and workmanship under normal use and service for two (2) years from the purchase date. A claim under this Limited Warranty must be presented during the Limited Warranty period and within thirty (30) days after any covered condition has occurred. A claim under this Limited Warranty shall be satisfied by either, in OmniSite's sole discretion, repairing or replacing the Products and/or part. Replacement Products may be new or reconditioned.

To make a claim under this Limited Warranty, OmniSite must first issue You a Returned Material Authorization (RMA) number. This number can be obtained by contacting OmniSite and a copy will be provided by email. A copy of the RMA must be included with any materials shipped to OmniSite. The entirety of Products must be sent back to OmniSite (unless specifically listed otherwise on the RMA form) and properly packaged to ensure against damage during shipping. If OmniSite determines that the claim is covered by this Limited Warranty, OmniSite will either, in its sole discretion, repair or replace the Products and/or part.

Any damages not covered under this Limited Warranty will not be repaired until a written purchase order is received. The Limited Warranty period shall not be extended by the replacement or repair of Products or parts under this Limited Warranty but the remaining Limited Warranty period shall continue in effect and be applicable to the replaced or repaired Products or parts under conditions of the Limited Warranty. Payment for cellular service covers only cellular transmission fees and in no way extends any portion of this Limited Warranty. This fee does not include out-of-warranty service or repair. The cellular service provided in conjunction with the purchase and use of Products and Services is not guaranteed, and OmniSite cannot and does not guarantee or represent that cellular service will be available in Your area nor that cellular service will be continuous and uninterrupted in Your area. It is Your responsibility to determine if cellular coverage is available in your area and to monitor the warning light on Products and Services to determine the cellular signal strength to Products and Services. You should contact OmniSite for assistance if needed. If cellular service is not available in your area, then your sole remedy is to return Products and Services as provided for in OmniSite's Return Policy as found at www.OmniSite.com. As such, OmniSite is not liable for any causes of action, losses or damages of any kind whatsoever arising out of mistakes, omissions, interruptions, errors, or defects in the provision of cellular service and failures or defects in the cellular network. Upon expiration of the Limited Warranty period, all liability of OmniSite shall be terminated.

This Limited Warranty does not apply in the following cases: failure to follow installation and operating instructions, misuse, alteration, abuse, accident or tampering, and repair by anyone other than OmniSite. THIS LIMITED WARRANTY IS EXCLUSIVE AND EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS OR LIABILITIES, WHETHER WRITTEN, ORAL, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. IN NO CASE SHALL OMNISITE BE LIABLE TO ANYONE FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES FOR BREACH OF THIS WARRANTY OR ANY OTHER WARRANTIES WHATSOEVER. This Limited Warranty gives specific legal rights. You may have other rights, which vary from state to state. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that the above limitation of exclusion may not apply to you. You, the individual user, should take care to determine prior to use whether Products and Services are suitable, adequate or safe for the use intended. Since individual applications are subject to great variation, OmniSite makes no representation or warranty as to suitability or fitness of Products and Services for any specific application.

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NOTES

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*Certain functions in the GuardDog 2 Mobile app are exclusive for OmniAdvantage subscribers. Non-subscribers have access to Read Only features. For more information about the OmniAdvantage Plan visit *OmniSite.com/omniadvantage* or call *317-885-6330 ext. 104*

CONTACT US

ADDRESS

203 W. Morris St.
Indianapolis, IN 46225

PHONE

Sales : 317-885-6330 x 4
Support : 317-885-6330 x 3
Main : 317-885-6330

EMAIL / WEB

sales@OmniSite.com
support@OmniSite.com
www.OmniSite.com

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