



UWS™ Hatch Sense	328-052
UWS™ Hatch Sense Kit	328-333
UWS™ Gateway	715-452

Reference Guide



Notices

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1 Safety Information

1.1 Overview

This section states important safety information that must be followed when setting up, operating, and troubleshooting this equipment. Study this information carefully before working with this equipment, as failure to follow these instructions may lead to personal injury or death, or damage to the equipment.

The precaution statements are general guidelines for the safe use and operation of this equipment. It is not possible to list all unsafe conditions. Therefore, if you use a procedure that is not recommended in this reference guide, you must determine if it is safe for the operator and all personnel in proximity to equipment. If there is any question of the safety of a procedure, please contact Unico, Inc. before use.

1. System documentation must be available to anyone that operates this equipment at all times.
2. Keep non-qualified personnel at a safe distance from hazardous environments where this equipment may be used.
3. Only qualified personnel familiar with the safe installation, operation and maintenance of this device should attempt startup or operating procedures.

When your equipment is delivered, it becomes the responsibility of the owner/operator of the unit to provide safe conditions and operation of the equipment. Some responsibilities include (but are not limited to) the following:

1. It is the responsibility of the owner/operator of these devices to ensure that this equipment is correctly and safely installed.
2. It is the responsibility of the owner/operator of these devices to ensure that this equipment, when installed fully complies with all federal, state and local codes.
3. It is the responsibility of the owner/operator of these devices to ensure that any person operating this equipment has been properly trained.
4. It is the responsibility of the owner/operator of these devices to ensure that any person operating this equipment has access to all information required for the safe use and operation of this equipment.
5. It is the responsibility of the owner/operator of these devices to ensure that they are properly maintained and safety inspected at regular scheduled intervals.
6. It is the responsibility of the owner/operator of these devices to ensure that any person who has not been trained on the safe use of this equipment does not have access to this equipment.

1.2 Conventions Used

The following example notation convention is used throughout this reference guide to indicate information important to personal safety or machine hazards.



Warning – Electrical Hazard

Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss due to contact with high voltages.



Attention

Identifies requirements and procedures that deserve extra attention to detail and must be followed to avoid risk of injury and/or damage to the equipment or machine and economic loss.

1.3 General Precautions



Warning – No Smoking

Do not smoke near the drive during operation or when close to a fuel source. LPG and Natural Gas fuels are flammable and can cause fire, explosions, injury or death.



Warning – Flammable/Explosive Work Area

When working in hazardous areas remember that fumes/gases are extremely dangerous and can cause severe illness, injury or death. Follow industry-recognized safety procedures to avoid injury or death.



Warning – Potential Electrostatic Charging Hazard

Clean only with a water damp cloth and allow to air dry for cleaning service. Do not use or install in high discharge areas. See IEC 60079-32-1 for further information.



Warning – Electrical Hazard

When working in hazardous areas, electrical static/sparks can cause fire, explosions, injury or death. Follow industry-recognized safety procedures to avoid injury or death.



Attention

Never operate this equipment in a manner other than as described in this reference guide. Operation in any manner not described in this reference guide should be considered unsafe and should not be attempted. Never start the equipment unless you have first verified that the installation and operation of the equipment are as described in this reference guide.



Attention

When in hazardous locations remain alert at all times. Never work when physically or mentally fatigued or while under the influence of alcohol, drugs or medication.

**Attention**

Always wear safety glasses with side shields when working near the equipment. Always wear industry-recognized personal protection equipment to avoid injury or death.

1.4 Installation and Maintenance Precautions**Attention**

All work should conform to the all site owner, equipment owner, state and local government regulations. Please familiarize yourself with these regulations.

**Attention**

Some of this equipment will be installed in areas that may pose risk of falling. Follow industry-recognized safety procedures for ladders and other lift equipment. Use approved safety harnesses as required by the installation.

**Attention**

Some of this equipment may be installed in a Class1/Division 1 hazardous location. Follow industry-recognized safety procedures to avoid explosions, injury or death.

1.5 Safe Service Practices

- Follow industry-recognized safety procedures.
- Wear industry-recognized personal protection equipment.
- Wear approved eye protection.
- Keep unnecessary personnel out of the work area.
- Never work alone.

1.6 Battery Installation and Replacement



Warning

Trained technician to use only Energizer L92 Lithium 1.5V AAA Batteries. Two-pack available from Unico (PN 938-802)



Warning

Servicing of the cell circuit, installation and replacement of the lithium cell must be done by a trained technician.



Warning

Do not replace batteries when an explosive atmosphere is present.



Warning

To reduce the risk of explosion do not mix old batteries with used batteries, or mix batteries from different manufacturers.



Warning

To reduce the risk of ignition in a flammable or explosive atmosphere, batteries must be change only in a location known to be non-hazardous.

2 About the Reference Guide

2.1 Overview

This section describes the contents and intended audience of this document.

2.2 Contents

2.2.1 What is covered

- Safety Information discusses safety hazards and procedures important to anyone working with the drive, system and/or application.
- About the Reference Guide describes the contents and intended audience of this document.
- Overview of the UWS™ System and Contact Information.
- Overview of the iOS Connected APP and SCADA Options.
- About the UWS™ Hatch Sense describes the wireless magnetic proximity switch.
- About the UWS™ Gateway describes the wireless to RS422/485 SCADA unit.
- The Power and Configure Devices section lists the initial steps that the user will need to perform to power the units and perform the initial configuration using the iOS 7 Connected App.
- The Field Installation section lists the steps that the user will need to perform to power the units, locate the best installation positions and perform the final configuration using the iOS 7 Connected App.

2.2.2 What is not covered

This reference guide does not provide full coverage. It does not include instructions for:

- Receiving and unpacking.
- Modbus Register list or SCADA system integration information.
- Product specifications

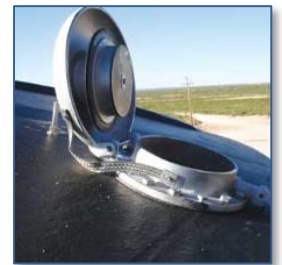
2.3 Intended Audience

The reference guide is intended for anyone who will be installing, operating and servicing the equipment. Installation should be performed by qualified personnel to ensure that correct practices are applied. Installation and operation should be performed by personnel familiar with both the hazardous location and the machinery or equipment.

3 Overview of the UWS™ System

The Unico® UWS™ Hatch Sense wireless sensor is designed to monitor the tank hatches, gates, valves, and other devices found in storage areas containing crude oil and other flammable liquids. When tank hatches are left open toxic and deadly gases may be released into the atmosphere. These gases pose a threat to anyone in the vicinity of the tank and are harmful to the environment.

The Hatch Sense sensor contains a magnetic proximity switch that detects if the latch on the hatch is open or closed. It uses Bluetooth Low Energy (BLE) technology to communicate with a mobile device or a Unico UWS™ Gateway.



3.1 Installation

No tools are required to install the Hatch Sense sensor. The sensor is attached to the cover of the tank hatch using the Velcro kit supplied. The magnet is secured to the latch on the hatch cover with suitable epoxy for outdoor use. The system is wireless so there are no wires to run.

3.2 Set Up

The sensor is quickly detected and paired with a Unico® UWS™ Gateway using either an iPad or an iPhone by running the Unico® Connected mobile application. The gateway allows one or more UWS™ devices to be linked to a customer's SCADA system for monitoring and logging.

3.3 Verification

Proper operation may be checked by observing the status of an LED on the sensor itself. It can also be monitored using an iPad or iPhone running the Unico® Connected App.

3.4 Monitoring

The UWS™ Gateway incorporates a clock/calendar that allows the unit to time and date stamp open and close events.

4 Contact Information

4.1 Website

For more information on the UWS™ System, go to:

<http://www.unicous.com/products/uws-hatch-sense-system>

4.2 Email Sales and Support

For product information, sales or support contact us at UWS.Support@unicous.com

5 SCADA Options

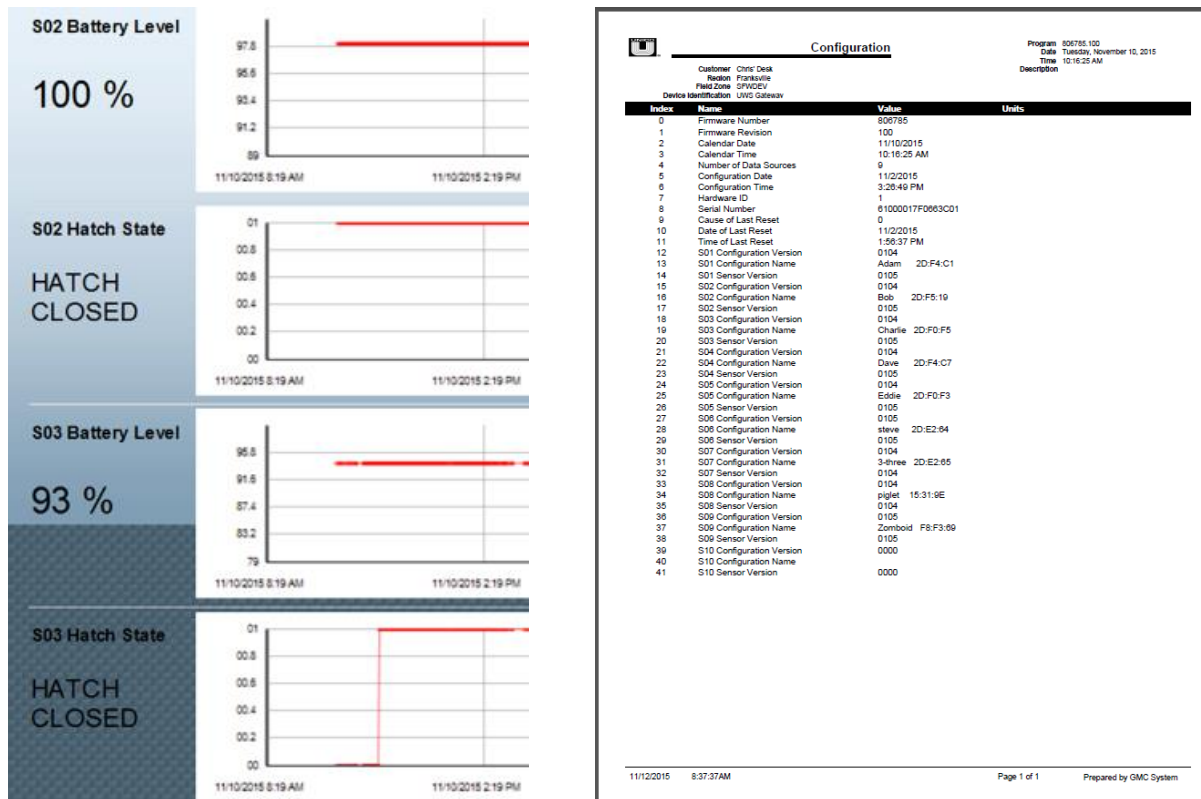
5.1 Customer Supplied

The UWS™ System can be integrated into SCADA system using the Modbus RTU protocol. Contact Unico at UWS.Support@unicous.com for the Modbus register list and assistance with system integration.

5.2 GMC® Global Monitoring and Control

The GMC® System for enterprise monitoring and control is an efficient, cost-effective way for to stay connected to your equipment. Using a powerful hosted enterprise architecture, the GMC® system reduces time spent manually collecting and analyzing data. Operators can monitor from a standard Web browser or Internet-enabled iOS mobile device. Personnel can be notified of faults and conditions automatically, even while away from a computer. Collected data is stored securely in a central database and is available through the same intuitive Web interface or exportable for use in third-party software. Other peripheral hardware can be integrated to provide a comprehensive solution.

5.2.1 Sample Screen in GMC



For more information on the GMC® System, go to <http://www.unicous.com/gmc>

For additional product information, sales or support contact us at GMC.Support@unicous.com

6 About UWS™ Hatch Sense

6.1 Overview

The Hatch Sense is a Bluetooth BLE Wireless magnetic proximity switch.



E482325

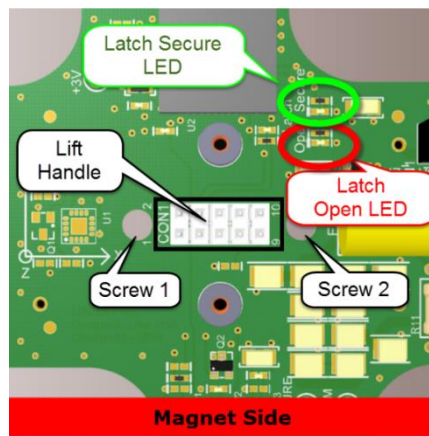
Intrinsically Safe Sensor for Use in Hazardous Locations
Class I Division 1 Groups A, B, C, D, T4 Ex ia

It is intended for environmental compliance use.

It is not intended for use in process control or for personal safety determination.



6.2 Module Diagram



6.3 Installation Kit PN 328-333

This kit includes:

- | | | |
|------------------|--------------------------------|-----------------------------|
| • 1 – PN 328-052 | Hatch Sense | Size: 2 ½ x 2 ½ x 1 ½ inch |
| • 1 – PN 936-782 | Magnet | Size: ¾ inch diameter |
| • 1 – PN 938-768 | Velcro Hook #72 Adhesive | Size: 2 inch x 2 inch |
| • 1 – PN 938-769 | Velcro Loop #72 Adhesive | Size: 2 inch x 2 inch |
| • 1 – PN 938-802 | Energizer L92 Ultimate Lithium | 1.5 V AAA 2 Pack Batteries. |

6.4 Customer supplied equipment

- iPhone, iPad, or iPod Touch. Requires iOS 7.1 or later.
- Outdoor/Marine epoxy for mounting the magnet.

6.5 Configuration Tool

Uses the iOS based Connected App.

This application is available for free from the App Store.

Search for “Regal Unico”.

6.6 Maintenance

Typical battery life is 2 years. Watch the battery life estimate in the Connected App or the SCADA System and replace batteries when low. Use the recommended battery to ensure that the battery level estimate is correct. Follow instructions in Section 1.6 Battery Installation and Replacement.

7 About UWS™ Gateway

7.1 Overview

The Gateway is a BLE Wireless to RS 422/485 Modbus RTU Data Gateway.

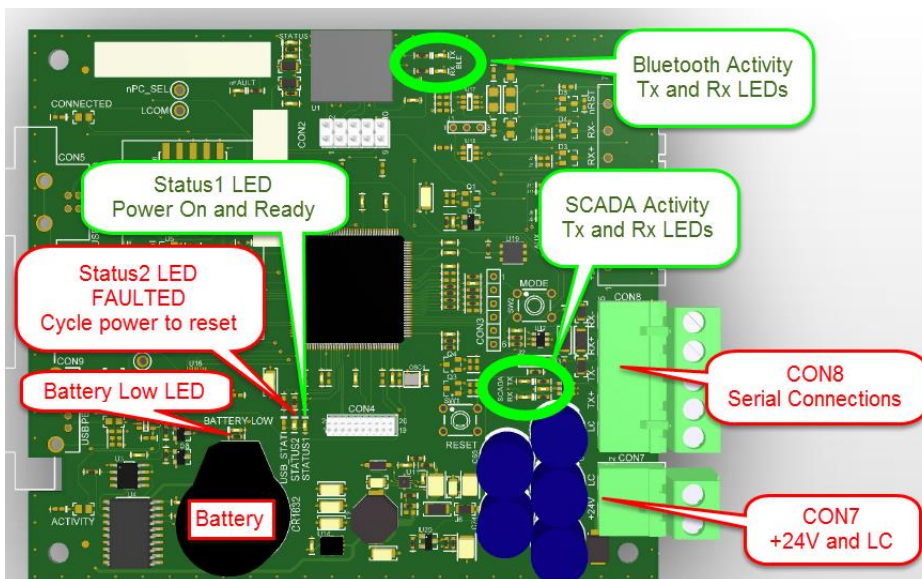
It is intended for use with one or more Hatch Sense Units and either the Unico GMC® System or a customer supplied SCADA system.

It includes an on-board Calendar for date/time stamped data.

Local user interface/configuration:

- SCADA Serial Port: RS422/485 (2-Wire or 4-Wire).
- SCADA Protocol: Standard Modbus RTU

7.2 Module Diagram



7.3 Customer supplied equipment

- Mounting: Four #6-32 screws. Minimum length 5/8 inch. Optional
- Power and serial cable: 22 AWG with 4 Twisted Pairs and overall shield recommended.
 - Input Voltage: 24V +/-10% (2-Wire)
 - Input Current: 150 mA

7.4 Gateway

- 1 - PN 715-452 Hatch Sense Size: 7 ¾ x 6 x 3 inch

7.5 Configuration Tool

Uses the iOS based Connected App.

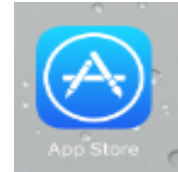
This application is available for free from the App Store. Search for “Regal Unico”

7.6 Maintenance

Typical battery life is 10 years. Periodically check the BATTERY LOW LED located next to the battery and replace batteries when it is RED. Use PN 934-490 Recommended part PANASONIC# CR1632 or ENERGIZER# CR1632.



8 iOS7+ Configuration and Monitoring Tool



8.1 Free Apps from Unico

8.1.1 Connected ~ UWS™ System Configuration and Monitoring Tool

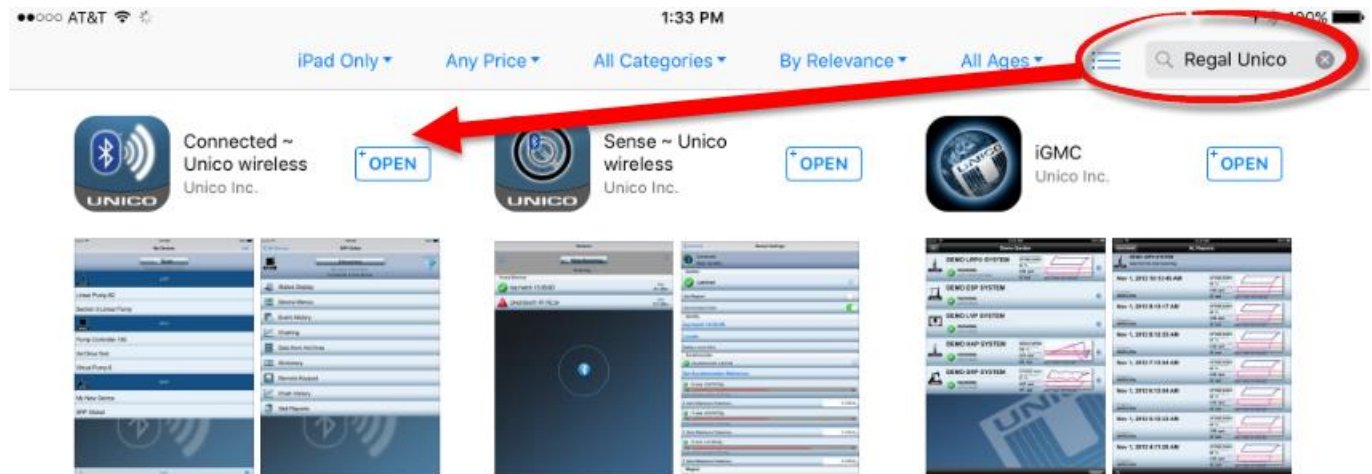
Used to configure and monitor both Gateway and Hatch Sense devices.

8.1.2 Sense ~ UWS™ Hatch Sense Configuration and Monitoring Tool

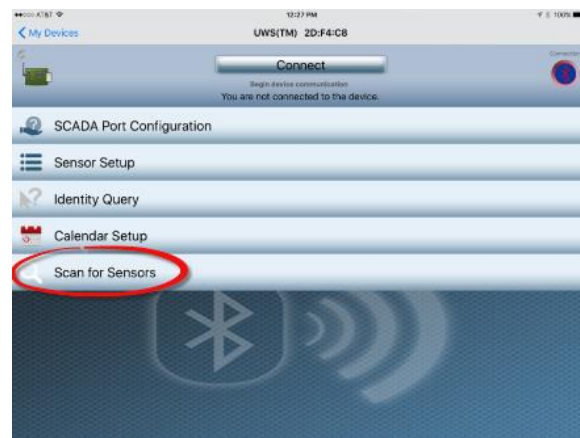
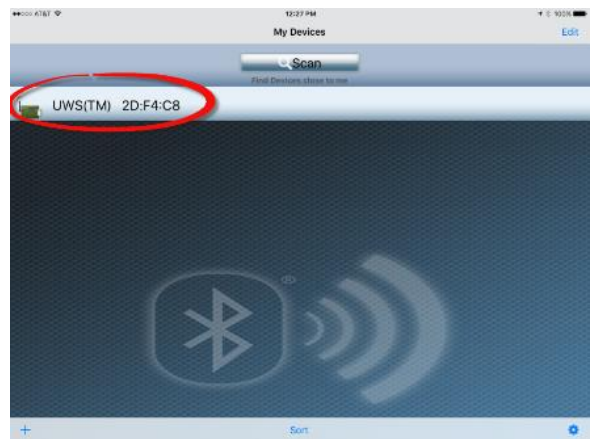
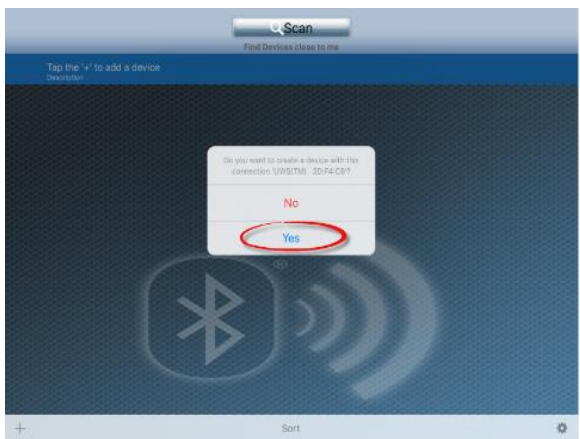
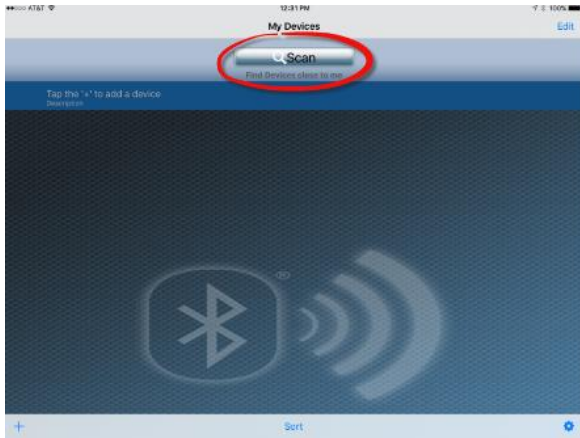
Used to configure and monitor Hatch Sense devices.

8.1.3 iGMC ~ Mobile access to the GMC® System.

Used to monitor database data serially polled from the Gateway.



8.2 Sample Screens in Connected



9 Power and Configure Devices

These steps do not have to be completed on location and may be performed in advance.

9.1 Tools required

- Phillips screw driver.
- 24V power supply.

9.2 Install the iOS based Connected App.

- Available for free from the App Store. Search for “Regal Unico” and install the App.

9.3 Gateway Devices

Configure the Gateway first.

1. Loosen the 4 screws and remove the enclosure lid.
2. Supply power to the Gateway to the control module’s CON7 terminal block locations labelled “+24V” and “LC”
3. Using the iOS device, launch the Connected App. Follow the on-screen instructions to create and configure the gateway
 - a. Choose “Scan”. Select the UWS™ Device. Answer Yes to the “Do you want to create a device with this connection?”
 - b. Choose “Connect”.
 - c. Ensure that the Calendar Setup data is correct. GMT time is recommended. This eliminates the time zone and daylight savings time complexity.
 - d. In SCADA Port Configuration, choose a Device ID and Data Rate.
 - e. Rename the gateway. Select the connection icon and tap on the device name. Select “Connection Name” and enter a unique name and select “Change the Name”.
 - f. (Optional) Add a security password to lock other users from changing the configuration. Select the connection icon and tap on “Security”.
4. Do not replace the enclosure lid yet.
5. Label the gateway with its unique name from Step 3.e above.

9.4 Hatch Sense Devices

For each Hatch Sense Unit perform the following steps. Finish each device before starting the next one.

1. Position the enclosure with the Magnet Side label towards you.
2. Loosen the 4 screws and remove the enclosure lid.
3. Note the orientation of the control module. The labels will be readable.
4. Remove the 2 screws and lift the control module from the enclosure using the grip in the center of the module.
5. Ensure the J1 BAT EN jumper covers both pins.
6. Install the batteries. Follow instructions in Section 1.6 Battery Installation and Replacement.
7. When the second battery is properly installed, the LEDs on the upper right corner of the control module will flash red and green on then green will flash 4 times. Note: Once the batteries are installed you can remove the BAT EN jumper disable the batteries to help identify individual hatch sense units.
8. Place control module back into the enclosure in its original orientation.
9. Do not replace the 2 screws or enclosure lid yet.

10. Using the iOS device launch the Connected App. Select the appropriate gateway device from Section 9.3 above. Follow the on-screen instructions.
 - a. Connect to the Gateway.
 - b. Choose “Scan for Sensors”. Find the hatch sense unit and select it.
 - c. Connect to the sensor. Make sure the magnet is not close to the sensor.
 - d. Choose “Locate”. The OPEN red LED will flash on the sensor you are connected to.
 - e. Choose “Identity” and give the sensor a unique name.
 - f. (Optional) Add a security password to lock other users from changing the configuration. Select the connection icon and tap on “Security”.
 - g. Ensure that the Control message is “Not Latched”
 - h. Place the magnet near the magnet icon on the “Magnet Side” label. Ensure that the Control message is “Latched”, if so then the control module is oriented correctly in the enclosure.
 - i. Disconnect from the sensor.
 - j. Return to the Sensor Scan view.
11. Replace the 2 screws to secure the control module in the enclosure.
12. To save battery life, ensure that the J1 BAT EN jumper covers only one pin until field installation.
13. Replace the enclosure lid and tighten the 4 screws. Do not overtighten. The recommended screw tightening torque is 2.5 lbf-in/30 cN-m.
14. Label the hatch sense unit with its unique name from Step 10.e.

9.5 Add Hatch Sense Devices to Gateway Configuration

1. Using the iOS device launch the Connected App. Follow the on-screen instructions to connect to the gateway and choose “Scan for Sensors”.
2. Ensure that all hatch sense units are in range.
3. Choose “Sensor Setup” and follow the on-screen instructions to add each hatch sense unit to the gateway’s sensor list.
4. Choose “Store” to write the configuration to the gateway.
5. Remove the power supply from the Gateway.
6. Replace the gateway enclosure lid and tighten the 4 screws. Do not overtighten. The recommended screw tightening torque is 2.5 lbf-in/30 cN-m.

10 Field Installation

10.1 Hatch Sense Devices

These steps will help you find the location for the magnet and the hatch sense unit.

Do not permanently install until these steps have been completed.

1. Look through the enclosure lid and verify that the J1 BAT EN jumper covers both pins. If not follow the instructions in Section 9.4
2. Find a flat area on the hatch lid near the latch.
3. Set the hatch sense unit on the hatch lid with the Magnet Side label pointing toward the latch.
4. Temporarily attach the magnet to the top of the latch at the point where it is in the closest proximity to the hatch sense unit.
5. Using the iOS device launch the Connected App. Select the appropriate gateway device. Follow the on-screen instructions to scan for the hatch sense unit and connect to the hatch sense device.
6. Locate the red "OPEN" LED and the green "SECURE" LED on the upper right side of the control module.
7. With the hatch lid closed and the latch fully seated, slowly move the sensor to find the best location.
 - a. Red LED is on and the app shows the message "Not Latched": Slowly move the sensor towards the magnet until the green LED turns on and the app shows the message "Not Latched".
 - b. Green LED is on and the app shows the message "Not Latched": Slowly move the sensor away from the magnet until the red LED turns on and the app shows the message "Latched". Nudge it back to the position where the green LED is on and the app shows the message "Not Latched".
8. Temporarily attach the hatch sense unit to the hatch lid.
9. Move the latch back slightly so that the hatch lid is still closed but it is no longer in its seated position.
10. Ensure that the Red LED is on and the app shows the message "Latched". If not move the sensor away from the magnet until it does that that the latch is open.
11. Return the latch back to the fully seated position and ensure that the green LED is on and the app shows the message Not Latched".
12. Mark the final locations of the magnet and hatch sense unit.
13. Permanently attach the magnet to the latch with the epoxy.
14. Permanently attach the Hatch Sense unit to the hatch lid with the Velcro. The Velcro #72 adhesive will have full bond strength in 24 hours. After 24 hours, the hatch sense unit side may be temporarily removed to replace the batteries.

10.2 Gateway Devices

These steps will help you find the location for the gateway.

Do not permanently install until these steps have been completed.

1. Loosen the 4 screws and remove the enclosure lid.
2. Temporarily supply power to the Gateway to the control module's CON7 terminal block locations labelled "+24V" and "LC"
3. Using the iOS device launch the Connected App. Follow the on-screen instructions to connect to the gateway and choose "Scan for Sensors".
4. Choose "Sensor Setup" and follow the on-screen instructions to add each hatch sense unit to the gateway's sensor list.
5. Ensure that all hatch sense units in range are in the gateway's sensor list.
6. Choose "Store" to write the configuration to the gateway. The gateway is now active and has data in the MODBUS registers.

7. Move the gateway to the desired location and ensure that all hatch sense units are in range.
8. Ensure that the gateway enclosure location is be located outside of Class I Division 1 hazard areas and outside the 10' spherical hazard radius.
9. Do not install the Gateway in a metal enclosure.
10. Remove temporary power connection.
11. Feed the 22 AWG cable with 4 Twisted Pairs and overall shield through the liquid tight cord grip and make the power connections to CON7 and the serial connections to CON8.
12. Ensure that there is power to and there is successful communications between the gateway and the SCADA system.
13. Ensure that all hatch sense units in range are in the gateway's sensor list.
14. Mount the gateway using the optional mounting screws.
15. Replace the gateway enclosure lid and tighten the 4 screws. Do not overtighten. The recommended screw tightening torque is 2.5 lbf-in/30 cN-m.

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