

**CURTISS -
WRIGHT**

**VALVES
DIVISION**



Monitoring Device

Installation Operation and Maintenance Manual

1. Product Overview

Real-Time Monitoring of Your Pressure Relief Valves

The inSure® Monitoring Device detects pressure events by measuring valve stem movement and recording critical data to report fugitive emissions more accurately. It can also provide data driven insights to detect unstable flow in challenging applications to troubleshoot your system and reduce maintenance costs.

Features:

- Detect and record pressure relief events to improve data acquisition and flow calculations
- Connect to DCS via wired or wireless communication
- Install easily with no penetration of valve pressure boundary
- Use in hazardous locations with intrinsic safety certification
- Powered by replaceable battery
- Retrofit to 2600 Series valve or purchase complete valve with factory installed monitor
- Internal storage for logging relief events



1.1. Downloading CW inSure® App

- Do not plug in battery until app is downloaded and ready to connect to the valve.
- Remember to have the Bluetooth activated and ready to receive data from valve

STEP 1 Scan QR Code to download or download from IOS App or GOOGLE Store
Search for **CW inSure**

STEP 2 Click download to install app to device

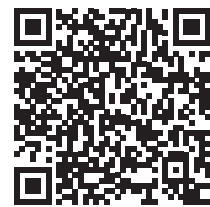
STEP 3 Click Open and allow bluetooth access to pressure relief valves

Proceed to section 6 page 10 for inSure Device installation

IOS App Install



Android App Install



The inSure App is ready for Valve installation. The app starts to scan for available devices and will not connect until device's battery is plugged in, and in range.

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2. Safety Instructions

These general installation and maintenance instructions are provided by Curtiss-Wright to customers as general guidance for proper use, of device storage and installation of pressure relief valves. The valves are critical components in pressurized systems that ensure the safety of personnel and property. Always follow all manufacturer and industry standard recommendations relating to proper installation, testing, maintenance, and reconditioning.

This should not be considered an exhaustive manual and it does not cover the full maintenance and repair of a valve. Certain configurations, applications, and usages may not be covered. All information presented in this manual is subject to change without notice. Contact your Sales Rep for the most current updates.

To ensure conformance to the product certification, installation, testing, maintenance, adjustment and repair shall only be performed by qualified personnel having the required skills and training. No repair, assembly, adjustment or testing performed by individuals other than a Factory Authorized Service Technician, or FAST trained technician shall be covered by the warranty extended by Curtiss-Wright to its customers. All applicable regulations, directives, codes and standards shall be adhered to when performing these activities. Failure to follow proper calibration or maintenance procedures will result in invalidation of the product certification, warranty and performance of the device.

Likewise, use of parts in any maintenance or repair activity other than factory-supplied OEM parts will invalidate the warranty and product certification extended by Curtiss-Wright to its customers. Incorrect selection or application of valves on the part of the customer is not covered by the warranty

These general instructions have been provided not only to ensure the proper installation and maintenance of pressure relief valve monitors, but also to provide for the safety of personnel who handle our products.

All possible hazards may not be identified in this manual. Conduct your own safety risk assessment given your specific system, environment, and configuration, and ensure proper control procedures are in place to prevent personal injury, illness or damage to property, product or environment.

It is the responsibility of the customer and user to properly train their personnel on all required maintenance procedures and safety standards to prevent injuries.

Comprehensive training, maintenance and repair is available, contact your local Curtiss-Wright representative for more information.

Improper handling, storage, installation and maintenance of a pressure relief valve can cause damage to the valve monitor and will invalidate the warranty. Please follow all recommended procedures.

Curtiss-Wright will not be responsible for damage from shipping or improper storage or handling.

Unpacking inSure Device

Always use caution when handling any device components. Some components require special equipment to safely move or install.

Specific Conditions of Use

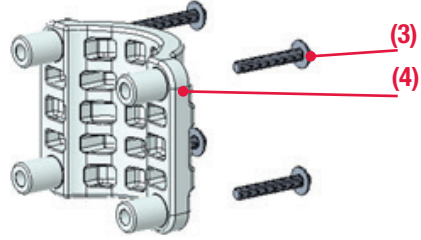
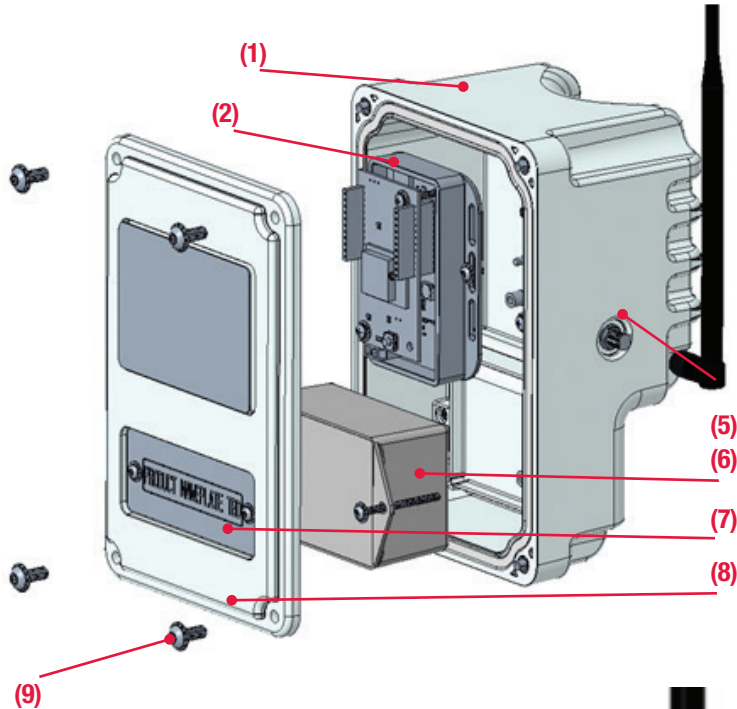
- The enclosure is non-metallic and poses an electrostatic charging hazard. Do Not Rub With Dry Cloth.
- The enclosure contains an isolated metal rating plate with a capacitance of 17 pF.
- IP rating is for ordinary locations only.

Cannot substitute components. Use only Farris Engineering Battery Part number 332051x5-500

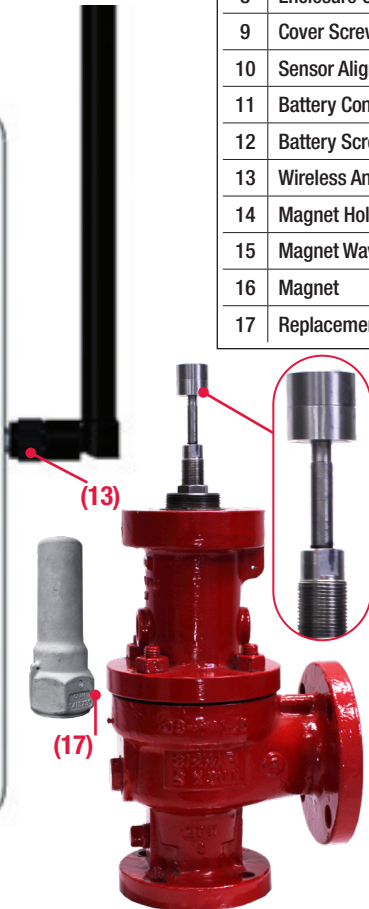
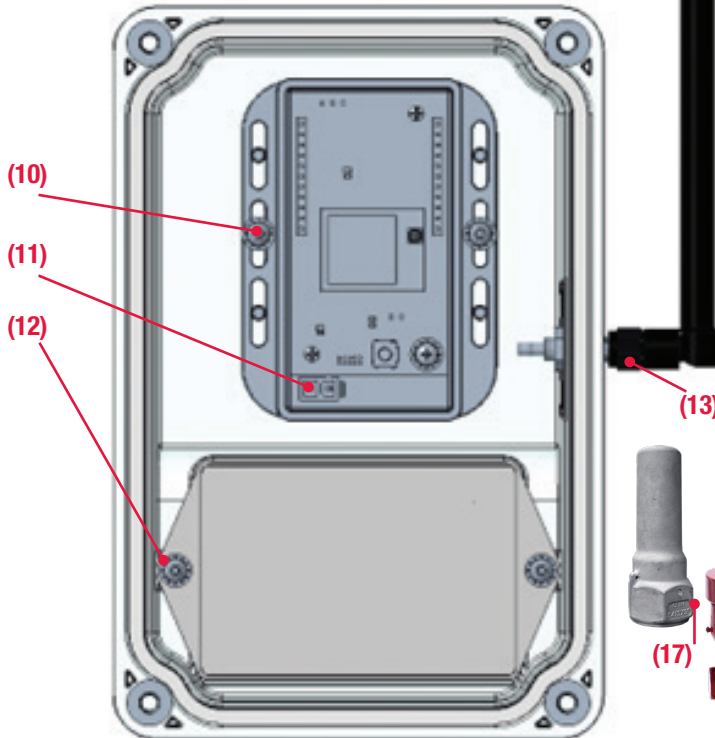
CAUTION ATTENTION
<p>Always use the appropriate tools, and in the correct manner, for adjustment or servicing of valves. Failure to do so could result in injury.</p> <p>The device is supplied with a magnet assembly. Use caution when handling or storing magnets as they may damage or destroy nearby electronics if not managed properly.</p>
<p>Utilisez toujours les outils appropriés et la bonne méthode pour régler ou entretenir les vannes Ne pas le faire pourrait entraîner des blessures</p> <p>L'appareil est fourni avec un ensemble magnétique Faites preuve de prudence lors de la manipulation ou du stockage des aimants, car ils peuvent endommager ou détruire les appareils électroniques à proximité s'ils ne sont pas gérés correctement</p>

3. Materials of Construction

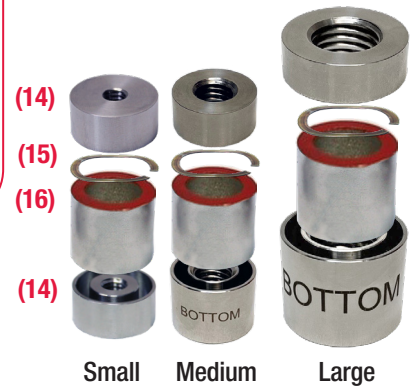
The inSure Device comes fully assembled with key components defined below, for installation, setup and calibration.
 Essential Tools Needed - 1/8" and 1/16" Hex drivers.



inSure® Monitoring Device		
	Description	Qty.
1	Enclosure Body	1
2	Sensor Alignment Module	1
3	Clamp Screws	4
4	Enclosure Clamp	1
5	Cable Gland or Antenna Bulkhead	1
6	Battery Module	1
7	Nameplate	1
8	Enclosure Cover	1
9	Cover Screws	4
10	Sensor Alignment Module Screws	2
11	Battery Connection	1
12	Battery Screws	2
13	Wireless Antenna	1
14	Magnet Holder Small, Medium, Large	2
15	Magnet Wave Washer	1
16	Magnet	1
17	Replacement Cap	1



Magnet Assembly



4. Type Numbering System

Retrofit kits can be installed on any 2600 Series pressure relief valve with cap. This kit includes a monitor, magnet, magnet holder, wave washer, replacement stainless steel cap, and cap gasket.

4KMON26	S	S	M -	W84
Kit Number	Stem Thread Size	Cap Size	Communication Protocol	Cap Material
4KMON26	S Small M Medium L Large	S Small L Large	M Wired 4-20 mA H WirelessHART™ S ISA100 Wireless™	W84 inSure Stainless Steel Cap

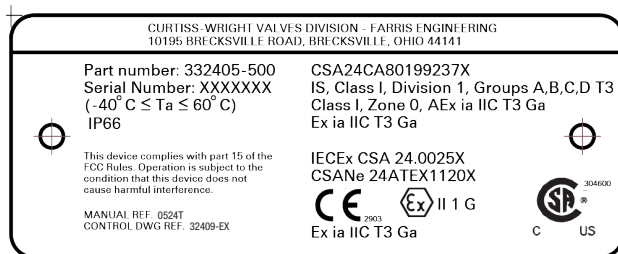
4.1 Authorized Replacement Parts

inSure Monitor Part Numbers	
Part Number	Description
332405-500	Main Housing Body Assembly, w/4-20mA
332406-500	Main Housing Body Assembly, w/WiHART
332407-500	Main Housing Body Assembly, w/ISA100

inSure Battery Kits		
Part Number	Description	Qty.
332051X6-500	Battery Module, Spare screws and Spacers	1
332051X5-500	Battery Module Only	1

inSure 2600 Series Cap Kits		
Part Number	Description	Qty.
4KC26SS	Cap/Magnet Module, Small Stem	1
308413X10-W84	Cap, Small	1
301297-010	Gasket, Cap, Small	1
332022X1-010	Magnet Holder, Small	2
332021X1-W90	Magnet, Small	1
332037-010	Wave Washer, Small	1
4KC26MS	Cap/Magnet Module, Medium Stem	1
308413X10-W84	Cap, Small	1
301297-010	Gasket, Cap, Small	1
332022X5-010	Top Magnet Holder, Medium	1
332022X2-010	Bottom Magnet Holder, Medium	1
332021X1-W90	Magnet, Small	1
332037-010	Wave Washer, Small	1
4KC26LL	Cap/Magnet Module, Large Stem	1
308412X4-W84	Cap, Large	1
301342-010	Gasket, Cap, Large	1
332022X3-010	Top Magnet Holder, Large	1
332022X4-010	Bottom Magnet Holder, Large	1
332021X2-W90	Magnet, Large	1
332038-010	Wave Washer, Large	1

Name Plate



5. inSure® Device Installation

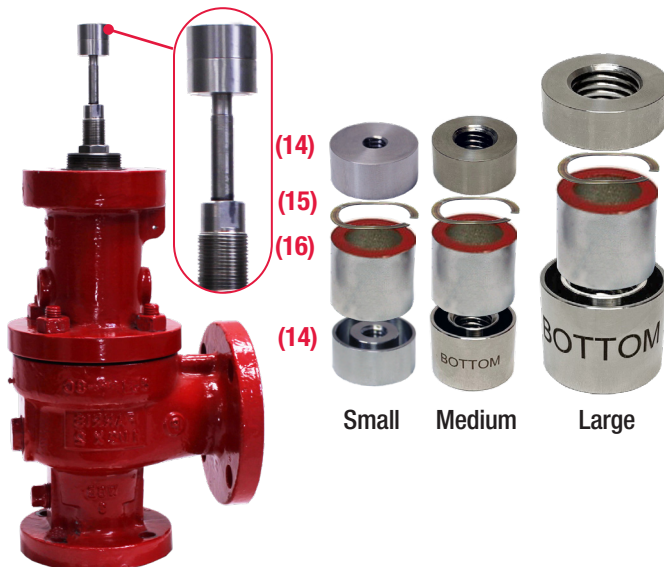
Please refer to the 2600 Series Maintenance Manual to service the valve

DO NOT PLUG IN BATTERY UNTIL READY TO CONNECT TO APP IN STEP 6.1

5.1 Mounting Magnet And Cap To Valve

CAUTION

The magnets possess a high magnetic force. Maintain adequate separation between individual magnets, as uncontrolled attraction can result in sudden impact, posing a risk of personal injury or damage to the magnets.



STEP 1 Uninstall the existing valve Cap

STEP 2 Apply Loctite 242, medium strength, to the stem thread

STEP 3 Screw bottom magnet holder, with the outside flat facing down, to the bottom of the stem thread. Hand-tighten until snug

Note, In the small size magnet holders they are the same top and bottom

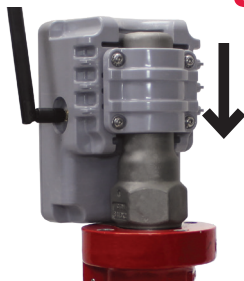
STEP 4 Check magnet is oriented with the red marking facing up. Place the magnet into the bottom magnet holder screwed onto the stem

STEP 5 Place the wave washer on the top face of the magnet. Screw the top magnet holder onto the stem with the outside flat facing up. Hand-tighten until snug. The magnet is now fully encapsulated between the two magnet holders

STEP 6 Allow the Loctite to cure for 24 hours to ensure the magnet assembly is firmly secured to the stem.

STEP 7 Install the provided stainless steel valve cap

5.2 Mounting Device to Cap



STEP 1 Remove enclosure lid, using a 1/8" hex.

STEP 2 Prepare the device for mounting to the valve cap by attaching the enclosure clamp to the enclosure body with the clamp screws using a 1/8" hex. Do not fully tighten.

STEP 3 Slide the device down to the base of the cap.

5. inSure® Device Installation

5.3 4-20mA Installation, Wired Only

Device is battery powered and does not accept loop power to the unit. It is also a “sink” device which requires a source for the current from the users control system.

The signal represents % open as follows:

0% open = 4mA

100% open = 20mA

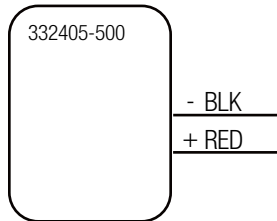


Figure 1

STEP 1 Connect DCS 4-20mA wiring to provided flying leads as shown in Figure 1

Entity Parameters	
Ui	<= 28V
Ii	<=93mA
Pi	<=650mW
Ci	<=15.7nF
Li	=0mH
Temp Class:	T3 (-40° C ≤ Ta ≤ +60° C)

Installation should be in accordance with ANSI/ISA RP 12.06.01 and ANSI/NFPA 70
Refer to control drawing 32409-EX

5.4 Antenna Installation, Wireless Only



STEP 1 Thread antenna onto bulkhead.
Hand-tighten until snug

*Blue Button
For ISA Installation See 6.2*

*ANTENNA
Installed here*

Bulk Head

5. inSure® Device Installation

5.5 Battery Connection

DO NOT PLUG IN BATTERY UNTIL READY TO CONNECT TO APP



This Device requires a battery to operate

The provided battery pack is disconnected when the device is delivered

STEP 1 Plug the battery into the battery connection.

5.6 Battery Replacement



The provided battery pack is disconnected when the device is delivered

STEP 1 Unplug the battery from the battery connection.

STEP 2 Unscrew the battery from the enclosure, using a 1/16" hex.

STEP 3 Replace the battery, using a certified replacement battery, 332051x5-500, as shown. Torque limit of 60in-lb. on the screws.

STEP 4 Re-attach enclosure lid. Torque the screws to 60in-lb.

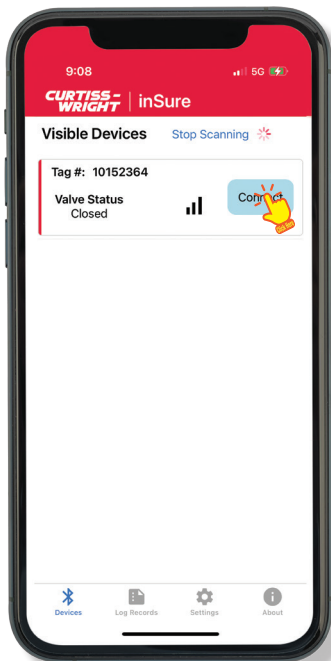
6. inSure® Device Set Up and Calibration

6.1 Connect to Device and Valve Status

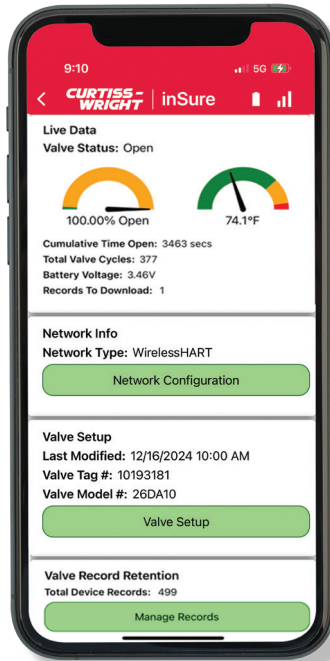
DO NOT PLUG IN BATTERY UNTIL READY TO CONNECT TO APP

- App should be updated to reflect latest upgrades.
- For the initial setup of WiHART™ or ISA100 protocol, connect to the device with the app within 60 seconds of plugging in the battery
- If there is no active Bluetooth connection after 60 seconds the device switches to its WiHART or ISA100 protocol
- Only one wireless communication protocol is active at one time
- Once the device has switched to its protocol the battery needs to be unplugged and plugged back in to re-connect to Bluetooth

SCREEN 1



SCREEN 2



VISIBLE DEVICES, SCREEN 1

When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

STEP 1 SCREEN 1, click **CONNECT** for desired valve to open **SCREEN 2**

VALVE STATUS, SCREEN 2

Shows if the selected valve is open or closed and provides the following information

Live Data

- **Tag Number:** Identifies the name of the valve, linked to the monitor
- **Cumulative Time Open:** Total time the valve is registered as opened across all recorded events
- **Total Cycle Count:** Numerical count of recorded events
- **Battery Voltage:** Current voltage output of battery
- **Records to Download:** Recorded events since the last time the app was opened via Bluetooth

Network Info

- **Network Type:** Currently selected communication protocol

Valve Setup

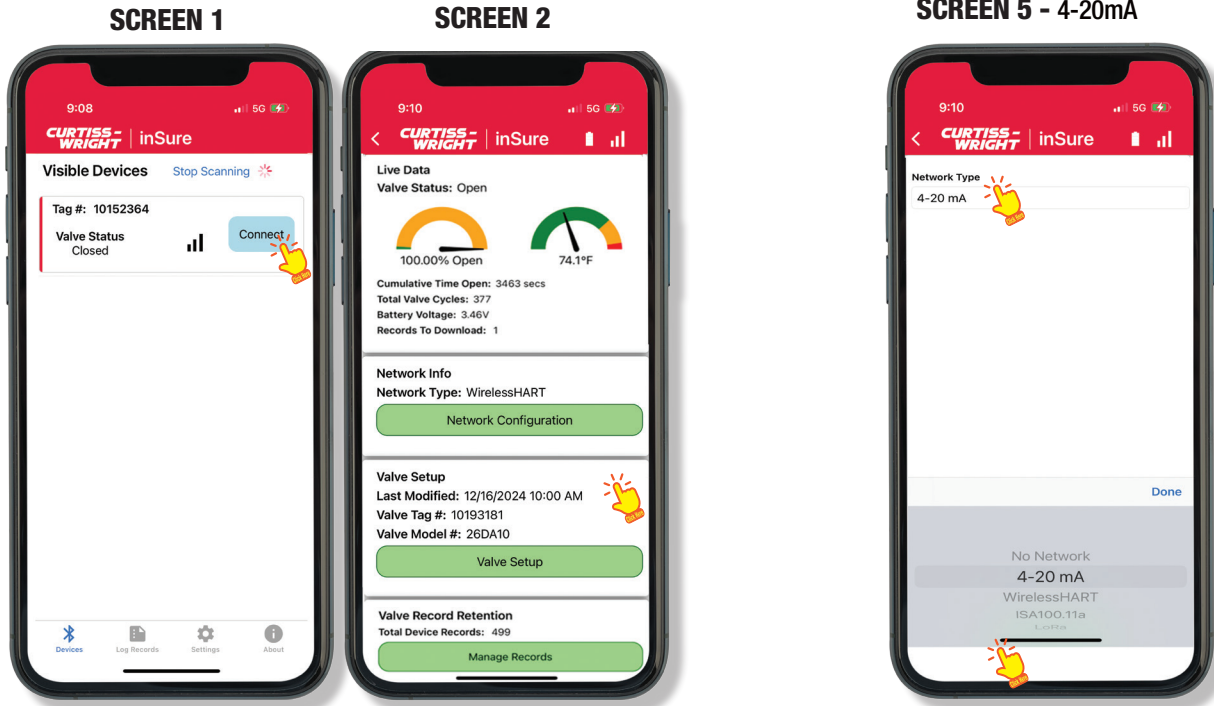
- **Model Number:** Identifies the name of the valve

Valve Records Retention:

- Delete all records
- Delete records last 30 days

6. inSure® Device Set Up and Calibration

6.2 Navigating to Network Type



VISIBLE DEVICES, SCREEN 1

When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

STEP 1 SCREEN 1 click **CONNECT** for desired valve to open **SCREEN 2**

STEP 2 SCREEN 2 click **NETWORK CONFIGURATION** to open **SCREEN 5**

STEP 3 Click Network Type to **SCROLL** and choose your network configuration

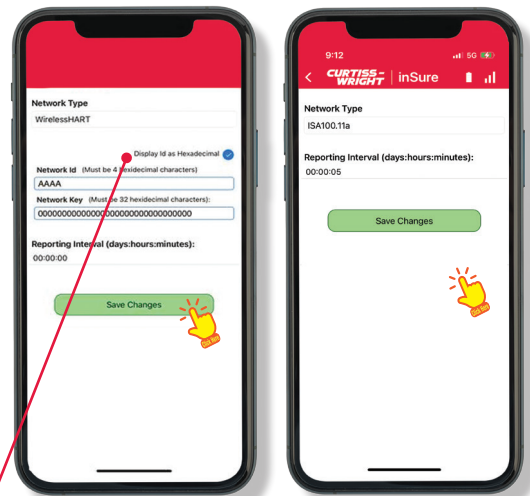
- 4-20mA - Step 5, Save Changes
- WiHART - Input Network Key, Save Changes
- ISA 100 - Press and hold blue button 15 sec. Section 5.4 Page 8 - Save Changes

STEP 4 CHOOSE Network information

STEP 5 Click **SAVE CHANGES**

WiHart

ISA100



Choose Hex or Decimal

If connecting to *wirelessHART* - refer to notes on section 8, page 15

6. inSure® Device Set Up and Calibration

6.3 Navigating to Valve Setup



VISIBLE DEVICES, SCREEN 1

When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

STEP 1 SCREEN 1, click **CONNECT** for desired valve to open **SCREEN 2**

STEP 2 Click **VALVE SETUP**, to Open **SCREEN 3**

VALVE SETUP SCREEN, SCREEN 3

STEP 3 User INPUT

- Enter Tag Number
- Enter Valve Model Number
must be entered to calibrate the device
- Enter Valve Serial Number

Logging Interval:

How often the device records a data point while the valve is in the closed position **STEP 4** Click **SAVE CHANGES**
STEP 5 Refer to 6.4 pg 13 for Calibration Instructions

OPTIONAL Click **SET VALVE PASSWORD** to assign a login password to the device

SENSOR CALIBRATION, SCREEN 4

- **Valve Stroke Length:**
Total lift of the valve
- **Sensor Zero Position:**
This shows the monitor calibration based on distance from the magnet. When calibrated this value should be near 2048. *See page 13*

6. inSure® Device Set Up and Calibration

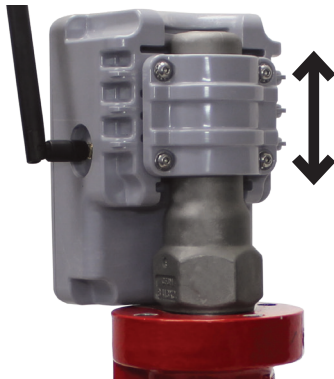
6.4 Calibration Using inSure App



The inSure monitor is designed for static applications and the calibration function is intended to account for installation interference. Once final installation of the device is complete, the calibration process should be followed to reset the zero position.

CAUTION

Ferrous material may impact device measurements if introduced within close proximity of the cap after set point calibration. Device should be calibrated after final installation in a static location.



Adjust the monitor up or down slowly until the app calibration arrow aligns with the green bar

The inSure® Device is Ready To Use.

VISIBLE DEVICES, SCREEN 1

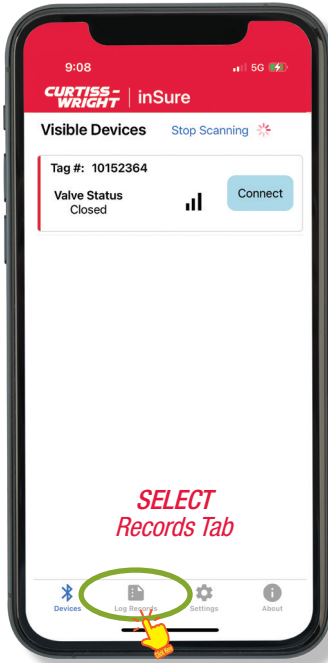
When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

- STEP 1 SCREEN 1** click **CONNECT** for desired valve to open **SCREEN 2**
- STEP 2** Click **VALVE SETUP** to Open **SCREEN 3**
- STEP 3** Click **SET VALVE ZERO POSITION** to go to **SCREEN 4**
- STEP 4** Adjust the device up or down slowly until the calibration arrow in the app aligns with the green bar
- STEP 5** Tighten clamp screws until snug. Torque limit 35 in-lb.
- STEP 6** Click the **SET ZERO TO CURRENT POSITION, SCREEN 4** in the app to complete the sensor calibration.
- STEP 7** Re-attach enclosure lid
- STEP 8** Return to home, **Screen 1**

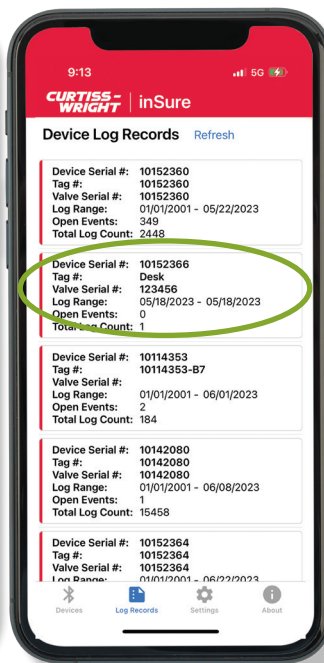
7. Data Access

7.1 Navigate to Log Records

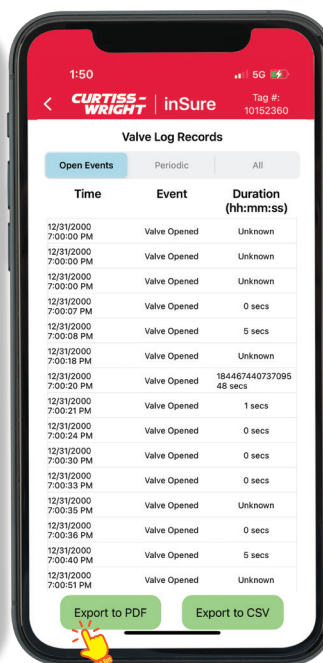
SCREEN 1



SCREEN 6



SCREEN 7



VISIBLE DEVICES, SCREEN 1
When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

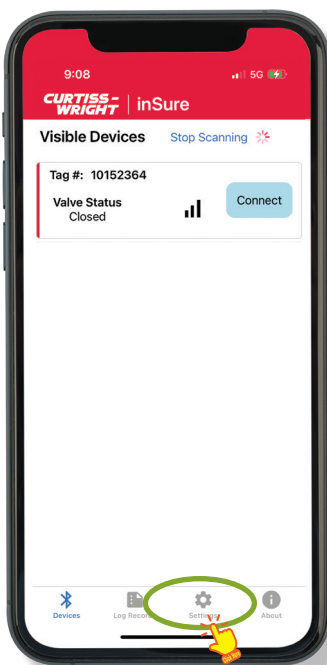
STEP 1 SCREEN 1
click **LOG RECORDS** to open **SCREEN 6**

STEP 2 Click **DESIRED DEVICE** to open **SCREEN 7**

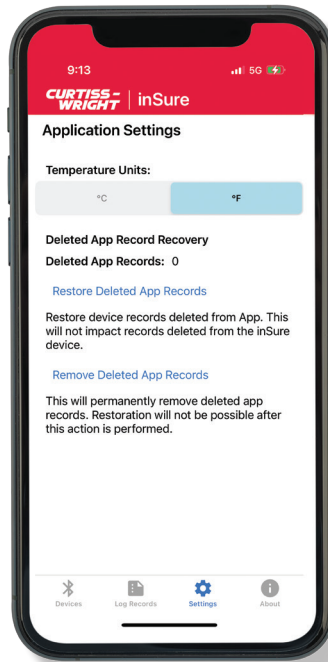
STEP 3 SCREEN 7, click. **pdf** or **CSV** to export data to share

7.2 Navigate to Application Settings

SCREEN 1



SCREEN 8



VISIBLE DEVICES, SCREEN 1
When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

STEP 1 SCREEN 1 click **APPLICATION SETTINGS ICON** to open **SCREEN 8**

STEP 2 The user can

- **Change** Temperature Units
- **Restore** Deleted App Records
- **Remove** Deleted App Records

8. Additional Notes

8.1 Frequently Asked Questions

What are the variable assignments for *WirelessHART* protocol?

The following variable definitions are used for the *wirelessHART* protocol:

1. PV (primary variable) = stem position as a % of full travel
2. SV (secondary variable) = present valve state as binary function (1 open or 0 closed)
3. TV (tertiary variable) = present ambient temperature of the monitor (degC)
4. QV (quaternary variable) = battery state of charge in voltage (> 3.0V is healthy)

How do you remove log records from the inSure device?

Log records can be removed using the inSure app. To remove records from the device, connect to the device, click "Manage Records", then click "Delete all Records". In order to delete records from the app, select "Log Records" in the home screen, slide the appropriate Device number to the left, and select the delete icon. Once this step is complete, go to "Settings" at the bottom of the homescreen and "Remove Deleted App Records". This will completely remove records from the Device and the app.

Can my inSure device be password protected?

Yes, using the app in the Valve Setup screen, you can add a password to the device to limit connection access. The password cannot be reset. If password is forgotten or lost, contact factory.

How do I store the device prior to installation to preserve the battery?

We recommend the battery be unplugged while device is being stored or waiting for final installation. If the device needs to be plugged in, we recommend setting the Network Configuration to "No Network" which will keep the device from trying to find a network signal.

If installed on a valve with restricted lift, how is that accounted for by the device?

The % open calculation of the device is based on the full stroked of the valve and does not account for restricted lift. If a valve is restricted to be fully open at 70% of stroke, the monitor will indicate 70% at a restricted "full open" and not read any higher.

8.2 Contact Support

Headquarters: 10195 Brecksville Road, Brecksville, OH 44141 USA • Telephone: 440-838-7690 • www.cw-valvegroup.com/farris

Offices Worldwide: For a listing of our global sales network, visit our website at www.cw-valvegroup.com/farrisdistributors.



WARRANTY

Curtiss-Wright products have a warranty period of twelve months from first installation or eighteen months from delivery, whichever is sooner. All other warranty terms are as per Curtiss-Wright Industrial Standard Terms and Conditions, a copy which is available at www.cw-industrialgroup.com/About/Group-Policies/Terms-Conditions.aspx. or contact your local representative.

Certifications, Compliances and Approvals

- **USA/Canada:** IS, Class I, Div 1, Groups A, B, C, D T3
- **Europe (ATEX):** Group II, Cat 1 G, Ex ia IIC T3 Ga
- **International (IECEX):** Ex ia IIC T3 Ga
- **Ingress Protection:** IP66

FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Environmental Conditions:

This equipment approved for outdoor use and wet locations.

- Altitude limit of 2000 M
- Temperature range of -40°C to 60°C
- Relative Humidity: 10-90% non-condensing
- Pollution degree: 4



NA: CSA 24CA80199237X
IECEX: IECEX CSA 24.0025X
ATEX: CSANe 24 ATEX 1120X

CURTISS - WRIGHT

 | **VALVES
DIVISION**

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Offices Worldwide: For a listing of our global sales network, visit our website at <https://www.cw-valvegroup.com/en-gb/contact-us>

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