CURTISS-WRIGHT | VALVES DIVISION

Farris Engineering

iNSure® 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. This data can be obtained via online app or communicated to your Distributed Control System or (DCS) and used to report fugitive emissions more accurately. It can also 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**

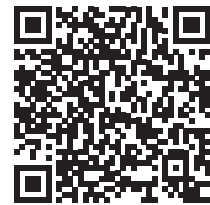**STEP 2** Click download to install app to device

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

Proceed to section 6 page 10 for inSure Device installation

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.

IOS App Install

Android App Install

Table of Contents

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
Always use the appropriate tools, and in the correct manner, for adjustment or servicing of valves. Failure to do so could result in injury.	
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.	
Utilisez toujours les outils appropriés et la bonne méthode pour régler ou entretenir les vannes Ne pas le faire pourrait entraîner des blessures	
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	

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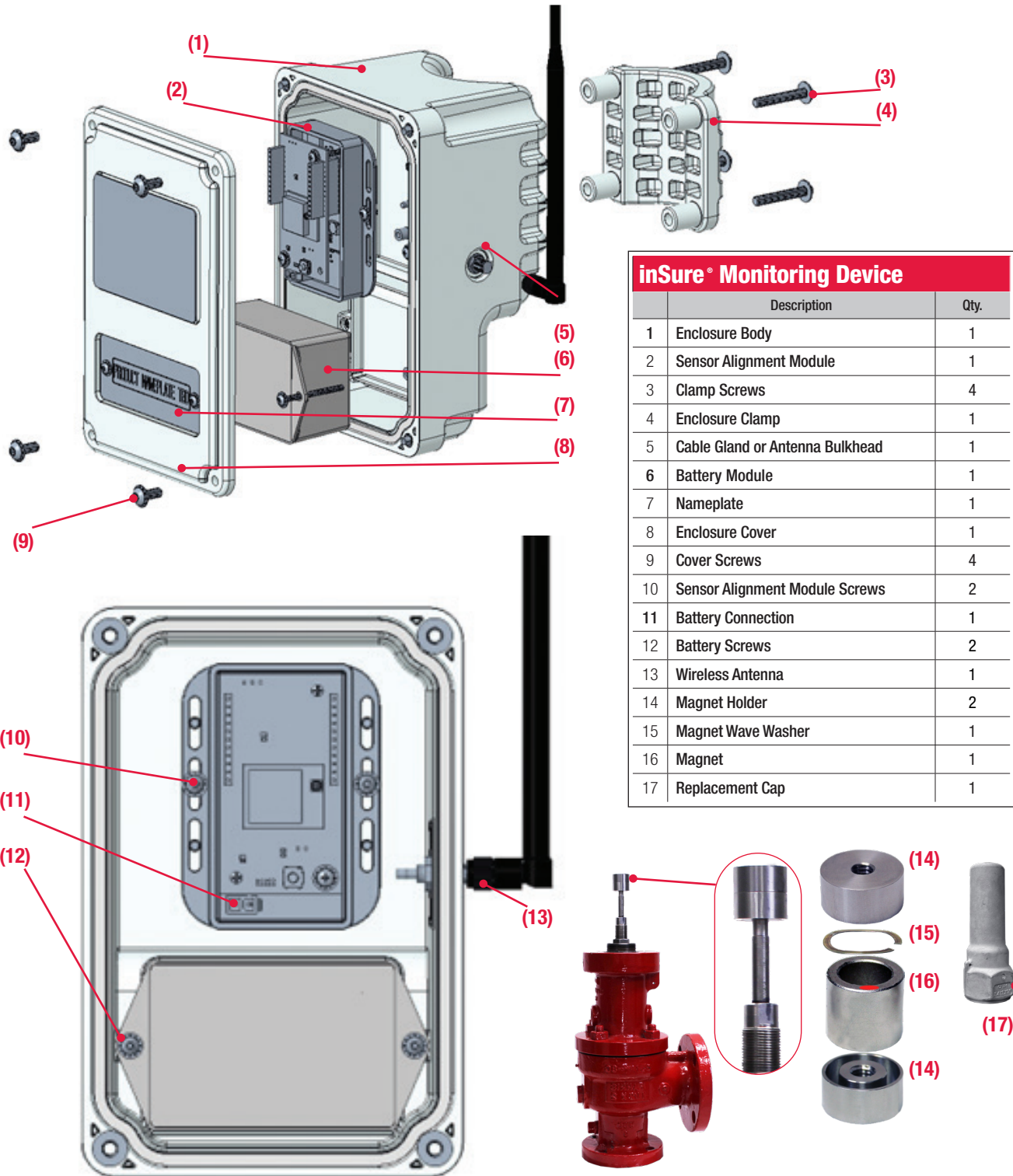
inSure® Monitoring Device		
	Description	Qty.
1	Enclosure Body	1
2	Sensor Alignment Module	1
3	Clamp Screws	4
4	Enclosure Clamp	1
5	Cable Gland or Antenna Bulkhead	1
6	Battery Module	1
7	Nameplate	1
8	Enclosure Cover	1
9	Cover Screws	4
10	Sensor Alignment Module Screws	2
11	Battery Connection	1
12	Battery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

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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 low ferrite 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	**S** Small	**M** Wired 4-20 mA	**W84** CF3M Low Ferrite
	M Medium	**L** Large	**H** *Wireless*HART™	
	L Large		**S** ISA100 Wireless™	

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
332022X2-010	Magnet Holder, Medium	2
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	Magnet Holder, Large	2
332021X2-W90	Magnet, Large	1
332038-010	Wave Washer, Large	1

Name Plate

CURTISS-WRIGHT VALVES DIVISION - FARRIS ENGINEERING
10195 BRECKSVILLE ROAD, BRECKSVILLE, OHIO 44141

Part number: 332405-500
Serial Number: XXXXXXX
(-40° C ≤ Ta ≤ 60° C)
IP66

This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

MANUAL REF. 0524T
CONTROL DWG REF. 32409-EX

CSA24CA80199237X
IS, Class I, Division 1, Groups A,B,C,D T3
Class I, Zone 0, AEx ia IIC T3 Ga
Ex ia IIC T3 Ga

IECEx CSA 24.0025X
CSANe 24ATEX1120X

CE 2903
Ex II 1 G
Ex ia IIC T3 Ga

CSA
304600
C US

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

- 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

5.1 Mounting Magnet And Cap To Valve

Magnet Assembly

North Marking
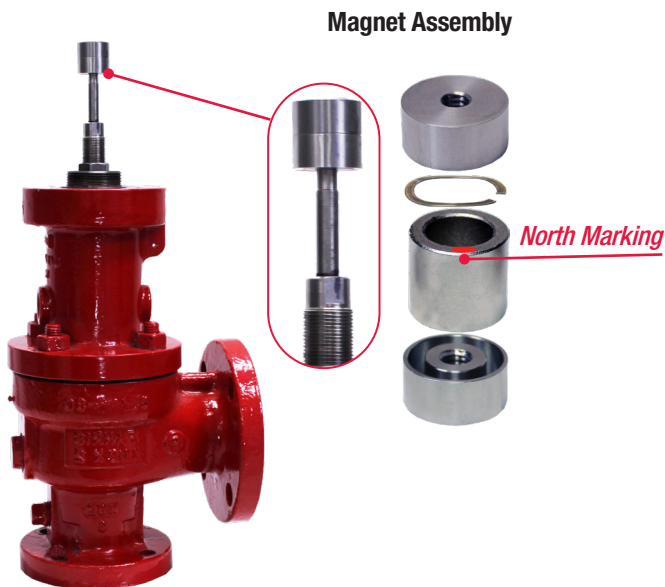
STEP 1 Uninstall the existing valve Cap

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

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

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

STEP 5 Place the wave washer on the top face of the magnet. Screw the second 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 Install the provided stainless steel valve cap

5.2 Mounting Device to Cap
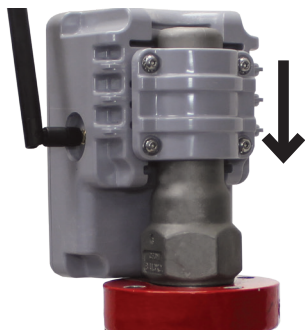
STEP 1 Remove enclosure lid, using a 1/8" hex.

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

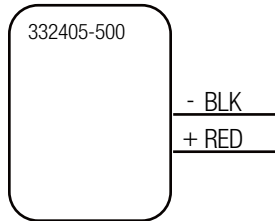**4-20mA - is only for communication and does not provide loop power to the unit**


```
332405-500

  - BLK
  + RED
```

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.

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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

- 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
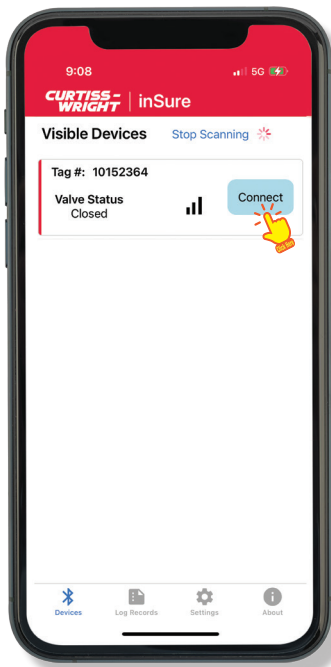
SCREEN 2
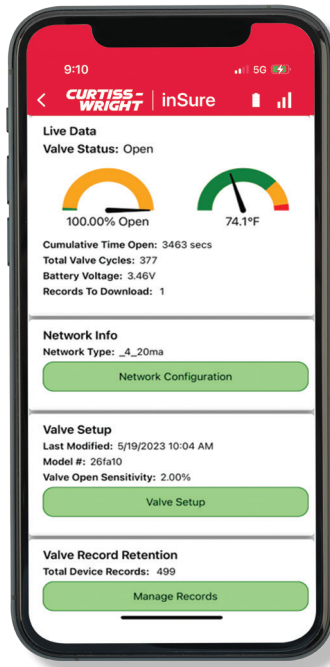
VISIBLE DEVICES, SCREEN 1
When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

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

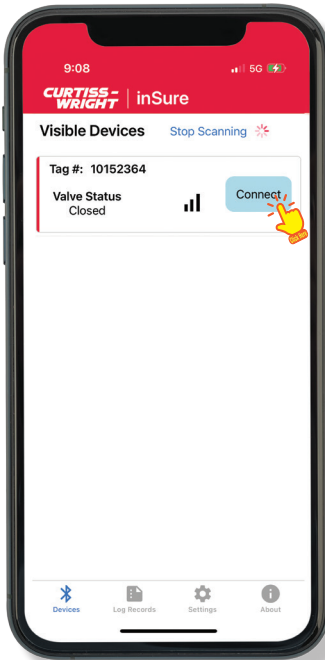- **Model Number:** Identifies the name of the valve

Valve Records Retention:

- Delete all records
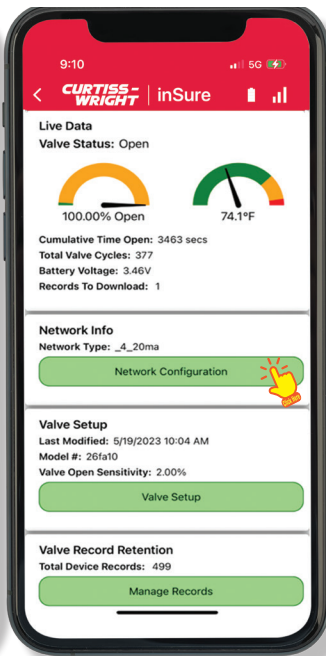- Delete records last 30 days

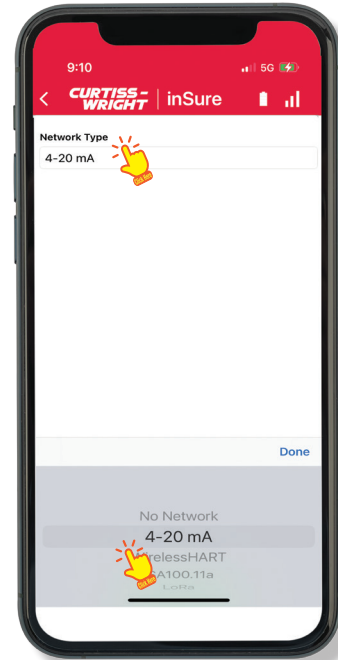# 6. inSure® Device Set Up and Calibration

6.2 Navigating to Network Type

SCREEN 1   **SCREEN 2**

SCREEN 5 - 4-20mA

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

WiHart   **ISA100**

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

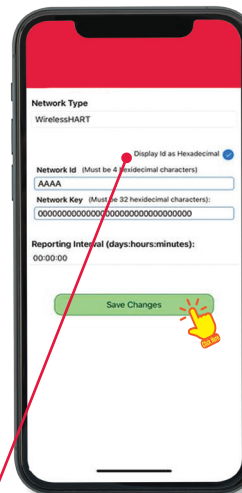**STEP 2 SCREEN 2** click **NETWORK CONFIGURATION**
to open **SCREEN 5**

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.
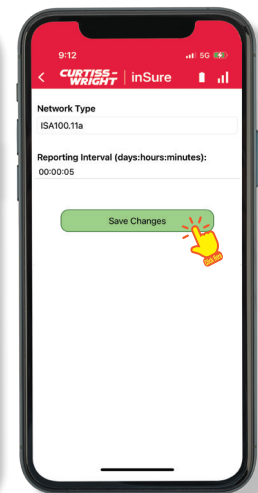 Section 5.4 Page 8 - Save Changes

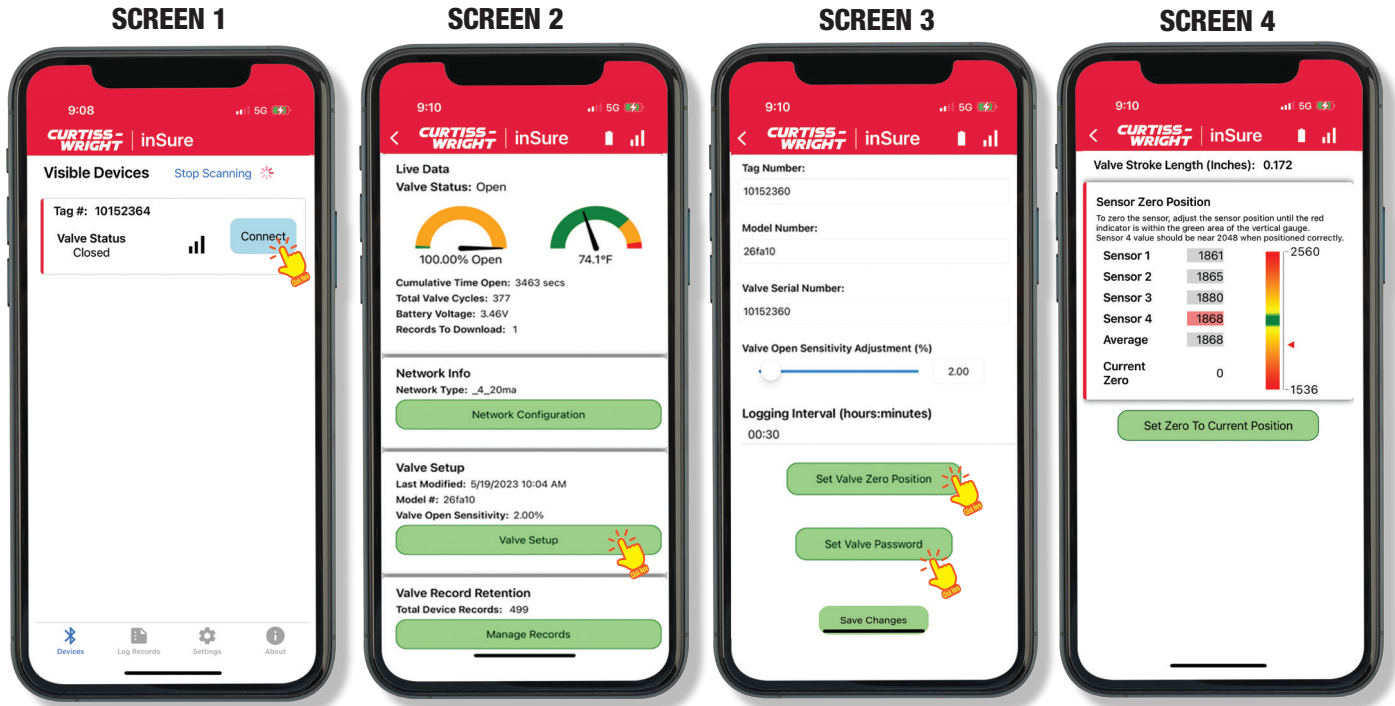**STEP 4 CHOOSE** Network information
STEP 5 Click **SAVE CHANGES**

Choose Hex or Decimal

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6. inSure® Device Set Up and Calibration

6.3 Navigating to Valve Setup

SCREEN 1   **SCREEN 2**   **SCREEN 3**   **SCREEN 4**

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

Valve Open Sensitivity:
This value indicates the percent of total lift before valve is considered opened. Default value is 2%

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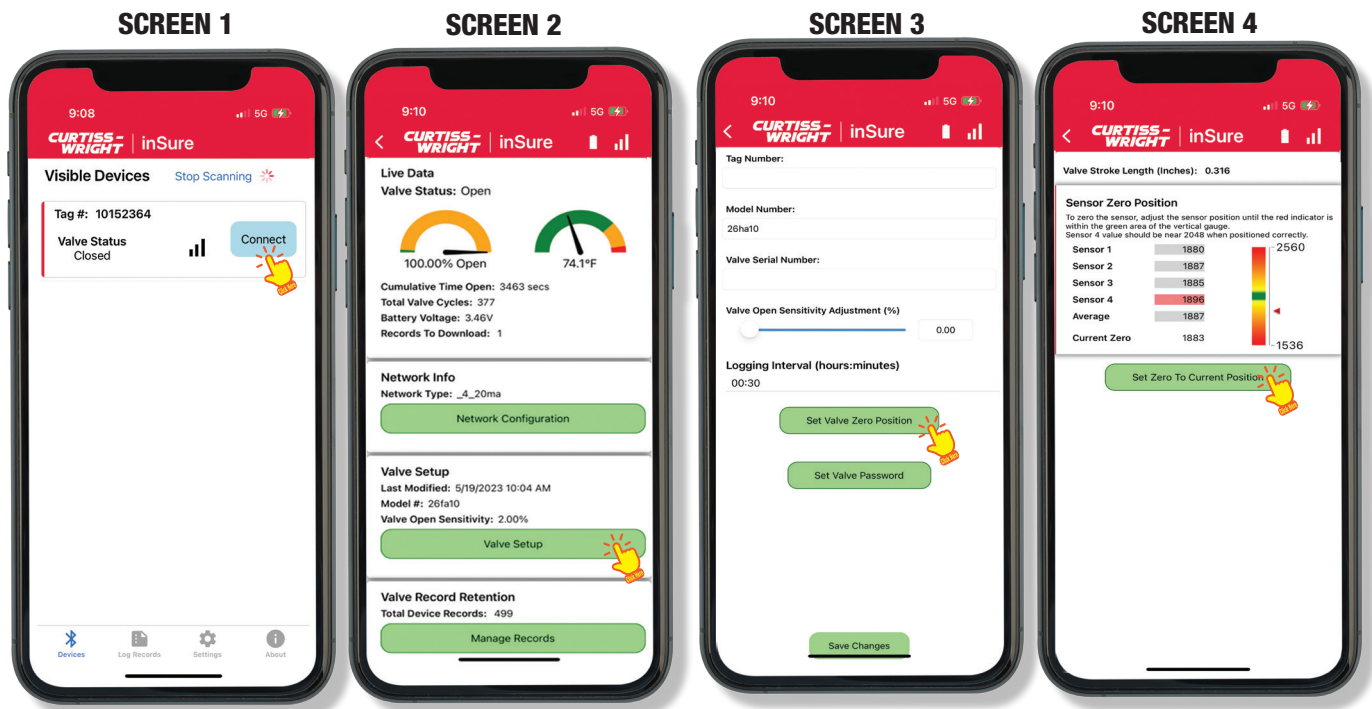**STEP 5** Refer to 6.4 pg 13 for Calibration Instructions

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. The "Sensor 4" value is highlighted in green when the monitor is properly calibrated. *See page 13*

6. inSure® Device Set Up and Calibration

6.4 Calibration Using inSure App

SCREEN 1

CURTISS-WRIGHT | inSure

Visible Devices   Stop Scanning

Tag #: 10152364

Valve Status
Closed   Connect

Devices   Log Records   Settings   About

SCREEN 2

CURTISS-WRIGHT | inSure

Live Data
Valve Status: Open

100.00% Open   74.1°F

Cumulative Time Open: 3463 secs
Total Valve Cycles: 377
Battery Voltage: 3.46V
Records To Download: 1

Network Info
Network Type: _4_20ma

Network Configuration

Valve Setup
Last Modified: 5/19/2023 10:04 AM
Model #: 26fa10
Valve Open Sensitivity: 2.00%

Valve Setup

Valve Record Retention
Total Device Records: 499

Manage Records

SCREEN 3

CURTISS-WRIGHT | inSure

Tag Number:

Model Number:
26ha10

Valve Serial Number:

Valve Open Sensitivity Adjustment (%)
0.00

Logging Interval (hours:minutes)
00:30

Set Valve Zero Position

Set Valve Password

Save Changes

SCREEN 4

CURTISS-WRIGHT | inSure

Valve Stroke Length (Inches): 0.316

Sensor Zero Position
To zero the sensor, adjust the sensor position until the red indicator is within the green area of the vertical gauge.
Sensor 4 value should be near 2048 when positioned correctly.

Sensor 1	1880	2560
Sensor 2	1887	
Sensor 3	1885	
Sensor 4	1896	
Average	1887	
Current Zero	1883	1536

Set Zero To Current Position

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

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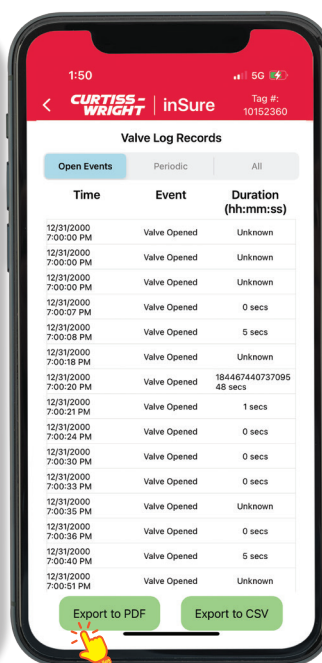When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

**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 **VALVE ZERO POSITION** to go to **SCREEN 4**

STEP 4 Adjust the device up slowly until the calibration arrow in the app aligns with the green bar

STEP 5 Tighten clamp screws until snug. Torque limit 60 in-lb.

STEP 6 Click the **SET ZERO TO CURRENT POSITION, SCREEN 4** in the app to complete the sensor calibration *If additional fine adjustment is needed, go to page 14*

STEP 7 Re-attach enclosure lid

STEP 8 Return to home, **Screen 1**

The inSure® Device is Ready To Use.

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6. inSure® Device Set Up and Calibration

6.5 Fine Adjustment for Calibration

Fine Adjustment Screw

If additional adjustment is needed

STEP 1 Slightly loosen the sensor alignment module screws using a 1/16" hex and slide the sensor alignment module until the calibration arrow aligns with the green bar

STEP 2 After alignment tighten the sensor alignment module screws. Torque Limit 15 in-lb do not exceed 15 in lb.

STEP 3 Tighten clamp screws until snug. Torque limit 60 in-lb.

STEP 4 Press the **SET ZERO TO CURRENT POSITION** to complete the sensor calibration

STEP 5 Re-attach enclosure lid. Torque the screws to 60 in-lb.

The inSure® Device is Ready To Use.

6.6 Contact Support

7. Data Access

7.1 Navigate to Log Records

SCREEN 1

SELECT Records Tab
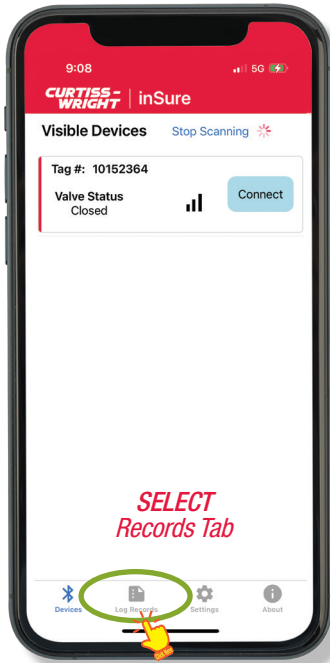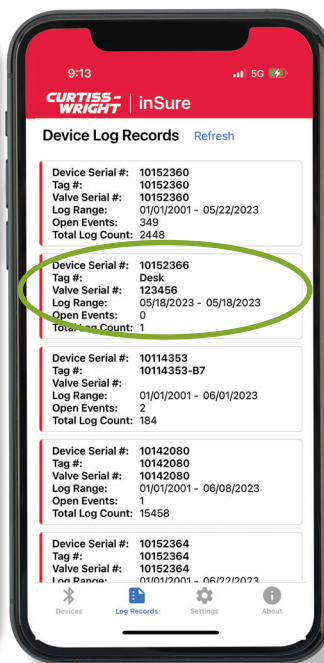
SCREEN 6

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
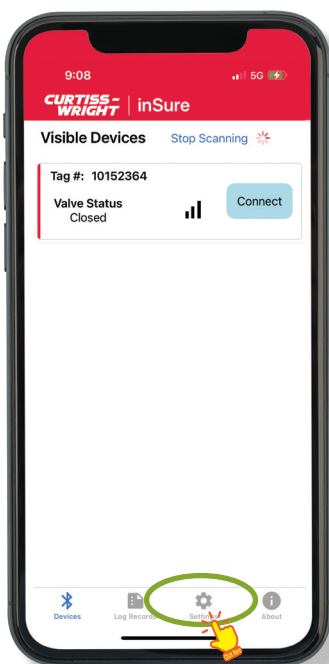
SCREEN 8
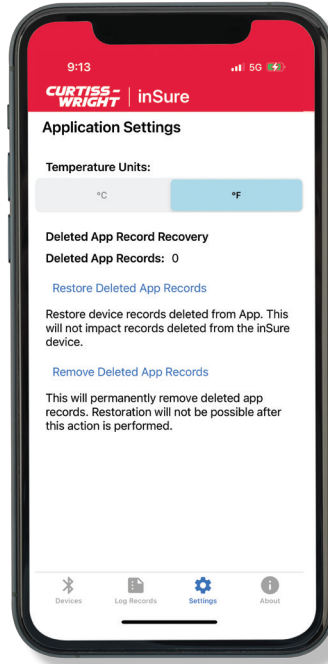
VISIBLE DEVICES, SCREEN 1
When app is open, the home screen appears showing powered devices within range of Bluetooth connection.

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

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WARRANTY

Certifications 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

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

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

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.

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