

**CURTISS -
WRIGHT**

**VALVES
DIVISION**



Monitoring Device

Installation Operation and Maintenance Manual

1. Product Overview

Ensuring Plant Function And Safety

The inSure Device provides real time monitoring for pressure relief valves. It communicates with your Distributed Control System, DCS or through the app providing valve status, access to reports and notification of pressure events.

Features:

- 1. Detects and records pressure relief events
- 2. Stores data for discharge analysis
- 3. Calculate flow based on valve lift
- 4. Does not penetrate into the valve's pressure boundary
- 5. Can retrofit to existing 2600 Series valve
- 6. Provides communication options for mobile field and control systems



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2. Safety Warnings

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 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. Failure to follow these procedures could result in severe bodily harm or even death.

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.

CAUTION

Always use the appropriate tools, and in the correct manner, for adjustment or servicing of valves. Failure to do so could result in injury.

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 provided, 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.

Unpacking inSure Device

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

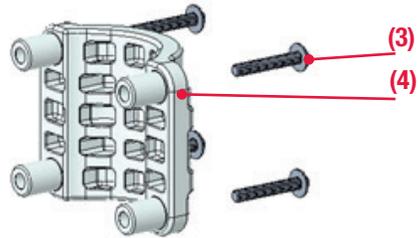
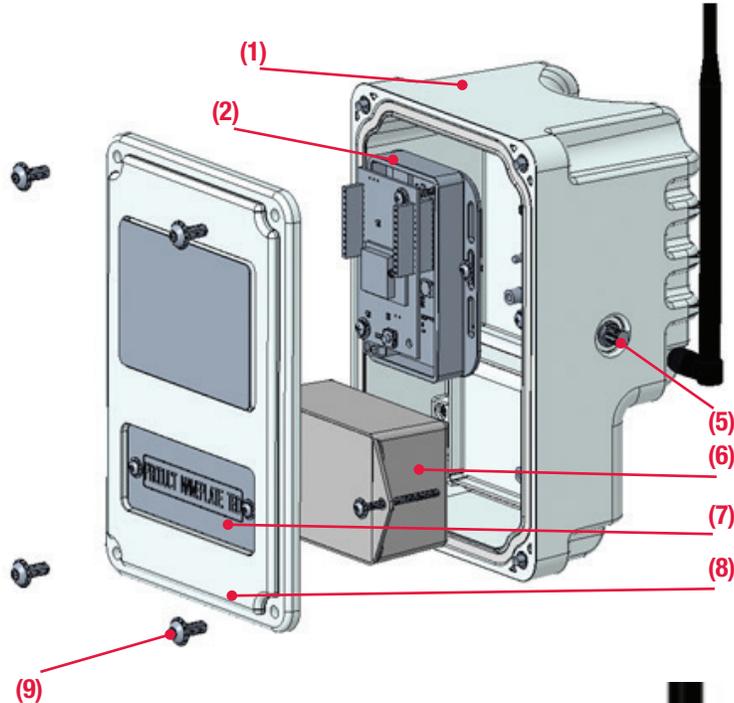
WARNING

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.

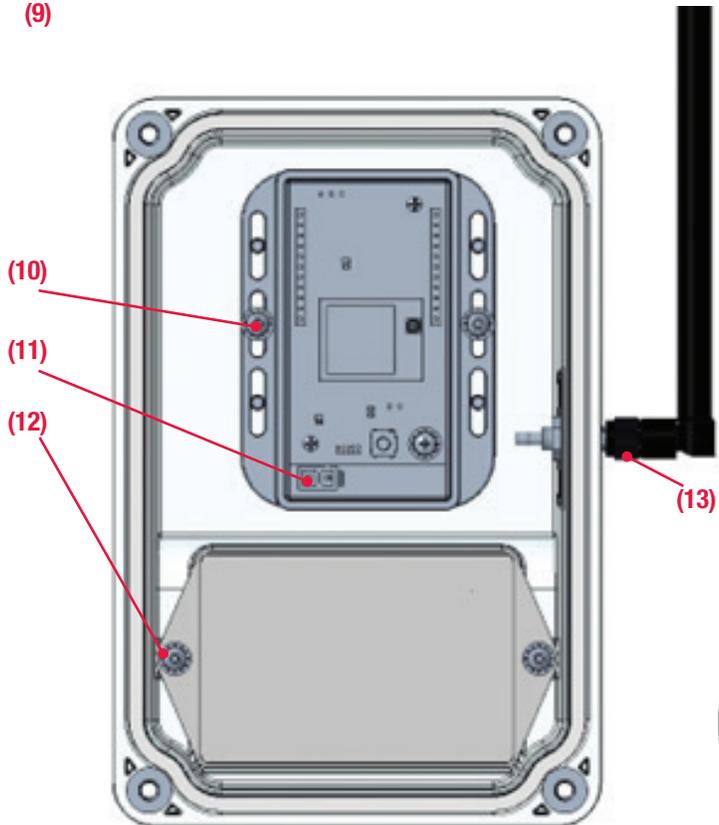
Curtiss-Wright will not be responsible for damage from shipping or improper storage or handling.

Materials of Construction

The inSure Device comes fully assembled with key components defined below, for installation, setup and calibration.



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



Magnet Assembly



Model Numbers and Authorized Replacement Parts

inSure I Monitor Mounting Kits							
Kit Designator	Component Designator	Product Series	Stem Thread Size	Cap Size	Communication Protocol	Dash	Cap Material
4K	MON	2600	S=Small, .312-18 UNC-2A	S= Small, 308413X10	M= 4-20 mA	-	W84=CF3M Low Ferrite
			M=Medium, .500-13 UNC-2A	L= Large, 308412X4	H = WiHart		Others - TBD
			L=Large, .750-10 UNC-2A		S = ISA100		

inSure I Monitor Part Numbers	
Part Number	Description
332051X1-500	Main Housing Body Assembly, w/4-20mA
332051X2-500	Main Housing Body Assembly, w/WiHART
332051X3-500	Main Housing Body Assembly, w/ISA100

inSure I Battery Kits		
Part Number	Description	Qty.
332051X5-500	Battery Module	1

inSure I 2600 Series Cap Kits		
Part Number	Description	Qty.
4KC26SS	Cap/Magnet Module, Small Stem	1
308413X10-W84	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
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
332022X3-010	Magnet Holder, Large	2
332021X2-W90	Magnet, Large	1
332038-010	Wave Washer, Large	1

Name Plate

MODEL NO.: 332051X1	MODEL NAME: 4-20mA
SERIAL NO.: XXXXXXX	
[ELECTRICAL RATINGS]	-40° C T _{amb} +60° C
CLASS 1, DIVISION 1, GROUPS A, B, C AND D	
Ex ia IIC T3 Ga	
CE II 1 Ex ia IIC T3 Ga	UK CA

5. inSure App Overview

5.1 Navigate to 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

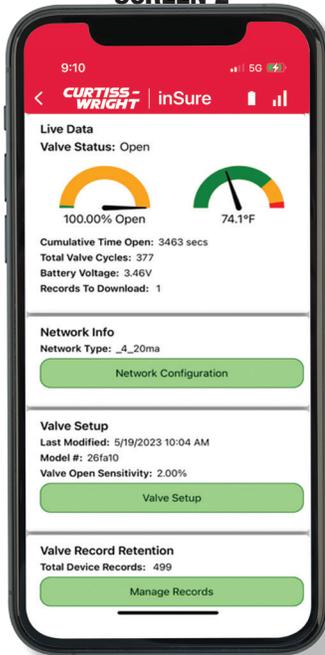


VISIBLE DEVICES, SCREEN 1

Home screen when the app is open. It shows devices within range of Bluetooth connection

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

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



Information:

located bottom right of app Device Info, Serial Number and Software Version



Application Settings:

located bottom right of app. The ability to restore or delete records

5. inSure App Overview

5.2 Navigating to Sensor Calibration



VISIBLE DEVICES, SCREEN 1

Is the home screen when the app is open. It shows devices within range of Bluetooth connection

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

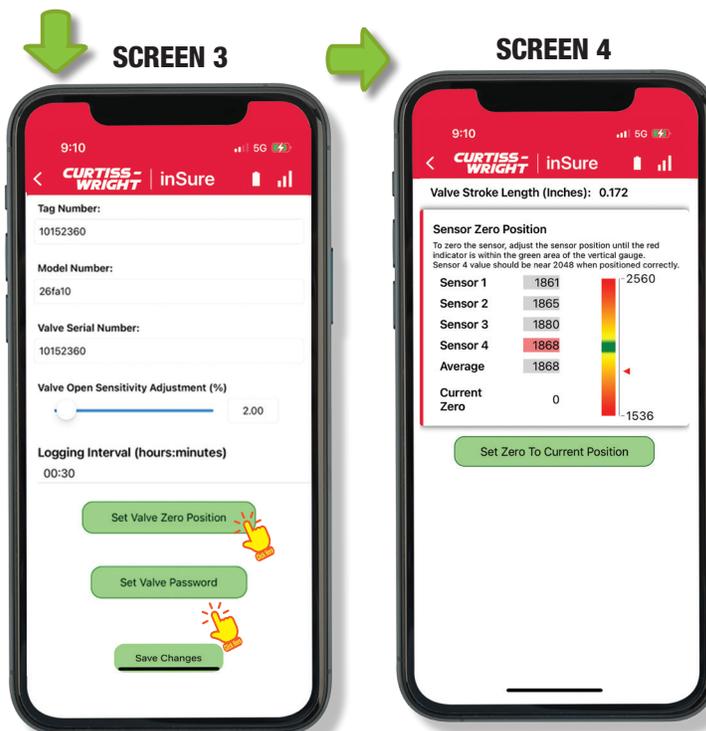
STEP 2 Click **VALVE SETUP**, to Open **SCREEN 3**

VALVE SETUP SCREEN, SCREEN 3

STEP 3 User **INPUT**

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

STEP 4 Click **SAVE CHANGES**



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 14*

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 5 Click **SET VALVE ZERO POSITION** to open **SCREEN 4**

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

5. inSure App Overview

5.3 Navigating to Network Type



VISIBLE DEVICES, SCREEN 1

Is the home screen when the app is open.
It shows 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**

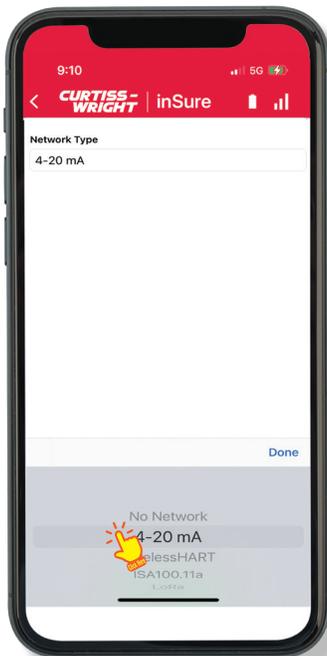
STEP 3 SCROLL To choose your network configuration

- 4-20mA
- WiHART
- ISA 100

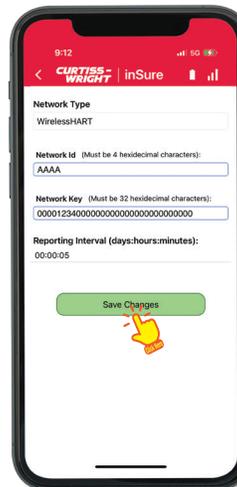
STEP 4 INPUT Network information

STEP 5 Click **SAVE CHANGES**

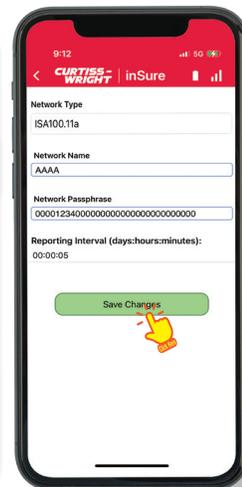
SCREEN 5 - 4-20mA



WiHart

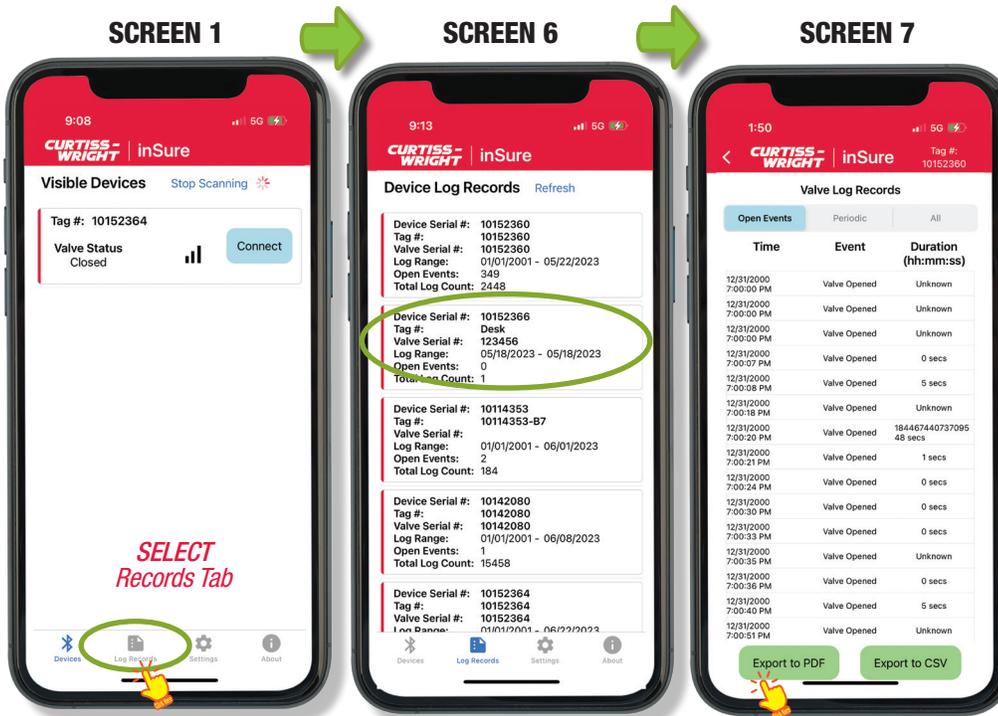


ISA100



5. inSure App Overview

5.4 Navigate to Log Records



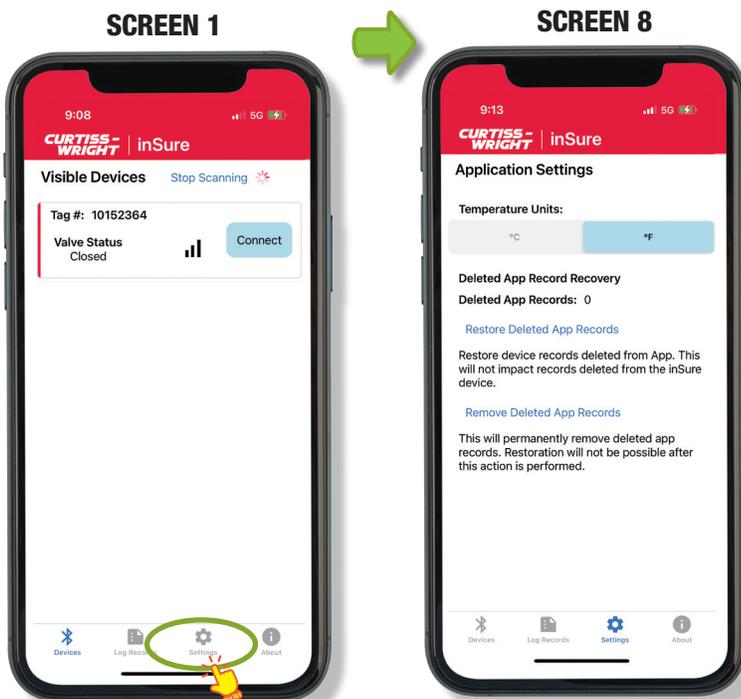
VISIBLE DEVICES, SCREEN 1 is the home screen when the app is open. It shows devices within range of Bluetooth connection

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

5.5 Navigate to Application Settings



VISIBLE DEVICES, SCREEN 1 is the home screen when the app is open. It shows 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

6. inSure Device Installation



WARNING

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

6.1 Mounting Magnet And Cap To Valve

- 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



6.2 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.



CAUTION

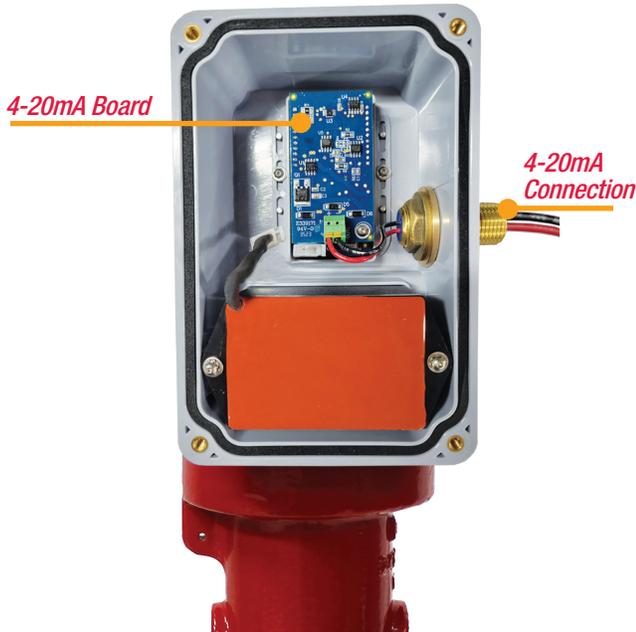
Always use the appropriate tools, and in the correct manner, for adjustment or servicing of valves. Failure to do so could result in injury.

6. inSure Device Installation

6.3 4-20mA Installation



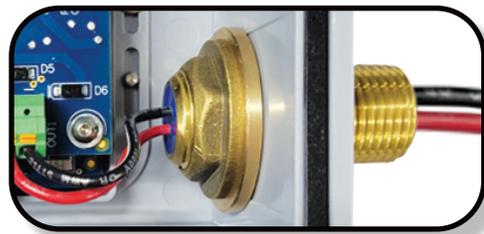
The device is supplied with a magnet assembly. Use caution when handling or storing magnets as they may damage or destroy nearby electronics if not managed properly.



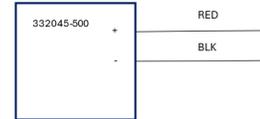
If the device is a WiHART, or ISA100 **SKIP** to **STEP 4**

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

STEP 1 Connect DCS 4-20mA wiring to provided flying leads



Entity Parameters:
$U_0 \leq 28V$
$I_0 \leq 93mA$
$P_0 \leq 650mW$
$C_i \leq 1.7nF$
$L_i = 0mH$
Temperature Classification: T4
(-40C ≤ T _a ≤ 80C)



6.4 Antenna Installation



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.



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

ANTENNA
Installed here

Bulk Head

6. inSure Device Installation

6.5 Battery Connection

DO NOT PLUG IN BATTERY UNTIL READY TO CONNECT TO APP



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.



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.
A green LED light appears for a few seconds followed by a flashing orange LED light as shown here

6.6 Battery Replacement

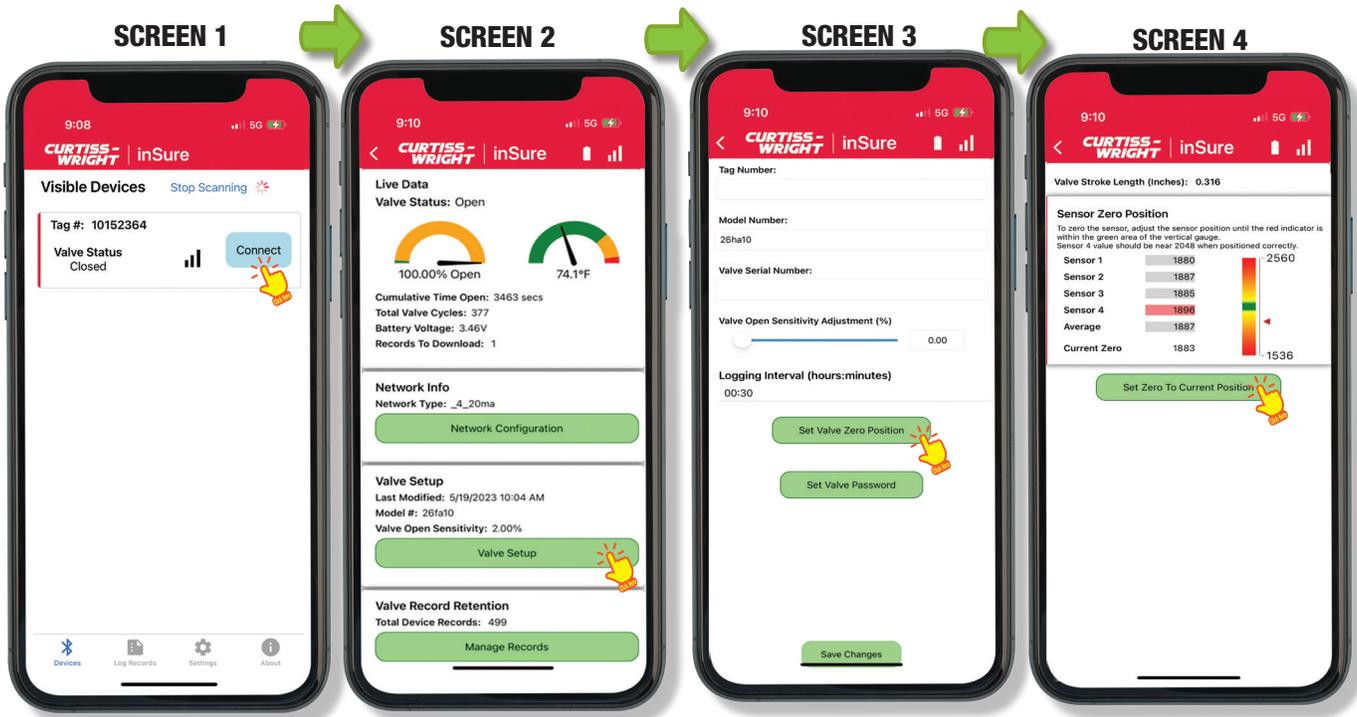


The provided battery pack is disconnected when the device is delivered

- 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.

7. inSure Device Calibration

7.1 Calibration Using inSure App



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

VISIBLE DEVICES, SCREEN 1

Is the home screen when the app is open. It shows 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 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 15

STEP 7 Re-attach enclosure lid

The inSure Device is Ready To Use.

8. inSure Device Calibration

8.1 Fine Adjustment for Calibration Using inSure App



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.

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.

Troubleshooting

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 and Approvals:

- **USA:** Class 1, Div 1, Group A, B, C, D Hazardous Location
- **Canada:** Ex ia IIC T3 Ga
- **Europe (ATEX):** Group II, Cat 1 G, Ex ia IIC T3 Ga
- **United Kingdom (UKCA):** Group II, Cat 1 G, Ex ia IIC T3 Ga
- **International (IECEX):** Ex ia IIC T3 Ga
- **Ingress Protection:** IP66, NEMA 4x



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

CURTISS - WRIGHT | VALVES DIVISION

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