

i-ALERT[®] Monitoring Solution



Installation, Operation, and Maintenance Manual

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1 Introduction and Safety

1.1 Introduction

Purpose of this manual

The purpose of this manual is to provide necessary information for:

- Installation
- Operation
- Maintenance



CAUTION:

Failure to observe the instructions contained in this manual could result in personal injury and/or property damage, and may void the warranty. Read this manual carefully before installing and using the product.

NOTICE:

Save this manual for future reference and keep it readily available.

Requesting other information

For instructions, situations, or events that are not considered in this manual or in the sales documents, please contact your ITT representative. Always specify the exact product type and identification code when requesting technical information or spare parts.

1.2 Inspect the package

1. Inspect the package for damaged or missing items upon delivery.
2. Note any damaged or missing items on the receipt and freight bill.
3. File a claim with the shipping company if anything is out of order.
If the product has been picked up at a distributor, make a claim directly to the distributor.

1.3 Limited warranty

ITT Goulds Pumps, Inc. ("Goulds") warrants to the original purchaser that your i-ALERT®2 Equipment Health Monitor (the "Product") shall be free from defects in materials and workmanship under normal use for a period of one (1) year from the date of shipment. This Limited Warranty does not cover software embedded in the Product and the services provided by Goulds to owners of the Product.

Due to the varied ways that Product(s) can be accessed and/or configured during use, battery life is excluded from warranty. It is your responsibility to backup any data, software, or other materials you may have stored or preserved on the Product. It is likely that such data, software, or other materials will be lost or reformatted during service, and Goulds will not be responsible for any such damage or loss. Recovery and reinstallation of software programs and user data are not covered under this Limited Warranty. The Limited Warranty does not apply to any software, even if packaged or sold with the Product or embedded in the Product. We are not liable for any damage a mobile app may inflict on companion product.

1.4 Safety



WARNING:

- The operator must be aware of the pumpage and take appropriate safety precautions to prevent physical injury.
- Risk of death, serious personal injury, and property damage. Installing, operating, or maintaining the unit using any method not prescribed in this manual is prohibited. Prohibited methods include any modification to the equipment or use of parts not provided by ITT. If there is any uncertainty regarding the appropriate use of the equipment, please contact an ITT representative before proceeding.
- Installation, Operation and Maintenance manuals clearly identify accepted methods for disassembling units. These methods must be adhered to.

Observe all safety messages highlighted in other sections of this manual.

1.5 Safety terminology and symbols

About safety messages

It is extremely important that you read, understand, and follow the safety messages and regulations carefully before handling the product. They are published to help prevent these hazards:

- Personal accidents and health problems
- Damage to the product
- Product malfunction

Hazard levels

Hazard level	Indication
DANGER:	A hazardous situation which, if not avoided, will result in death or serious injury
WARNING:	A hazardous situation which, if not avoided, could result in death or serious injury
CAUTION:	A hazardous situation which, if not avoided, could result in minor or moderate injury
NOTICE:	<ul style="list-style-type: none"> • A potential situation which, if not avoided, could result in undesirable conditions • A practice not related to personal injury

1.6 Safety regulations for Ex-approved products in potentially explosive atmosphere

Description of ATEX

The ATEX directives are a specification enforced in EU for electrical and non-electrical equipment. ATEX deals with the control of potentially explosive atmospheres and the standards of equipment and protective systems used within these atmospheres. The relevance of the ATEX requirements is not limited to Europe. You can apply these guidelines to equipment installed in any potentially explosive atmosphere.

Description of ETL

The ETL Mark is proof of product compliance to North American safety standards. Authorities Having Jurisdiction(AHJs) and code officials across the US and Canada accept the ETL Listed Mark as proof of product compliance to published industry standards.

Description of IECEx

The IECEx certificates of conformity attest that a sample of the Ex product, have been independently tested and found to comply with the International Standards. It also attests that the manufacturing site has been audited to verify that the manufacturer's quality system meets IECEx requirements.

Safety regulations regarding the Battery

Do not charge, short circuit, crush, disassemble, heat above 100°C (212°F), incinerate or expose contents to water.

Personal requirements

ITT disclaims all responsibility for work done by untrained and unauthorized personnel.

These are the personnel requirements for Ex-approved products in potentially explosive atmospheres:

- All users must know about the risks of electric current and the chemical and physical characteristics of the gas and/or vapor present in hazardous areas.
- The installation for Ex-approved products must be made in conformity to the international or national standards (IEC/EN 60079-17).

1.7 Product approval standards

<https://www.ittproservices.com/aftermarket-products/monitoring/i-alert2-condition-monitor/country-certifications/>

Radio Certifications

North America USA and Canada certifications

Standards tested to:

UL 913

UL 60079-0

UL 60079-11

CSA-C22.2 No. 157-92

CSA-C22.2 No. 60079-0:11

CSA-C22.2 No. 60079-11:14

Markings USA:

Class I, II, III; Division 1; Groups C, D, E, F, G

Class I; Zone 0, AEx ia IIB Ga (Groups C & D)

Markings Canada:

Class I, II, III; Division 1; Groups C, D, E, F, G

Ex ia IIB Ga (Groups C & D)

Ambient temperature: -40°C to 60°C | -40°F to 140°F

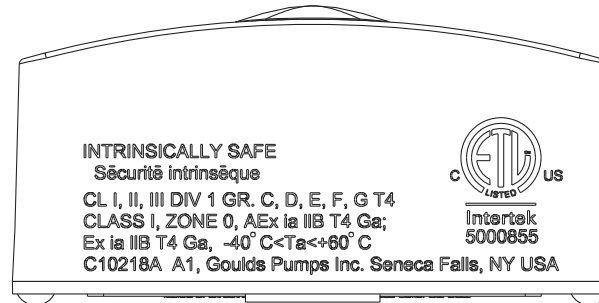


Figure 1: North America USA and Canada

Europe and Worldwide certifications

Standards tested to:

ATEX

EN 60079-0:2012

EN 60079-11:2012

EN 60079-26:2007+COR1:2011

EN 50303:2000

text here

JINIOSH-TR-46-1:2015

JINIOSH-TR-46-6:2015

text here

IECEX

IEC 60079-0:2011

IEC 60079-11:2011

IEC 60079-26:2006

ATEX & IECEX Markings

I M1 Ex ia I Ma

II 1G Ex ia IIB T4 Ga

II 1D Ex ia IIIC Da T200°C Da

Ambient Temperature: -40°C to +60°C | -40°F to +140°F

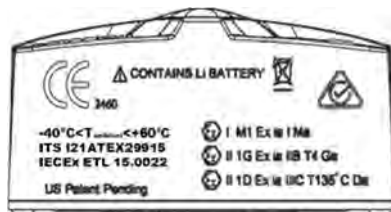


Figure 2: ATEX & IECEX Markings

Ingress Protection

IP68 for all countries except Japan

IP20 for Japan only

Electromagnetic Compatibility Certifications (EMC)

Standards for testing i-ALERT[®]2 Equipment Health Monitor

Radiated Emissions

FCC 47CFR 15 Subpart B:2014

EN 61000-6-4:2007

Electro-Static Discharge Immunity Test

(EN 61000-4-2:1995 per EN 61000-6-2:2007 +AMD 1 Cor 12)

(EN 61000-4-2:2009 per ETSI EN 301 489-1 V1.9.2

Radiated, Radio-Frequency, Electromagnetic Immunity

(EN 61000-4-3:2002 per EN 61000-6-2:2007 +AMD 1 Cor 12)

(EN 61000-4-3:2006+A1:2008+A2:2010 per ETSI EN 301 489-1 V1.9.2

Power Frequency Magnetic Field Immunity Test

(EN 61000-4-8 1993 per EN 61000-6-2:2007 +AMD 1 Cor 12)

Standards for testing Bluetooth radio

Industry Canada, Interference-Causing Equipment Standard for Information Technology Equipment (ITE)

ICES-003 Issue 5 August 2012

Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments

CENELEC EN 61000-6-2:2007 +AMD 1 Cor 12

Electromagnetic compatibility (EMC) Generic standards - Emission standard for industrial environments

CENELEC EN 61000-6-4:2007

Electromagnetic Compatibility (EMC) standard for radio equipment and services;

Part 1: Common technical requirements

ETSI EN 301 489-1 V1.9.2 (2011-09)

ElectroMagnetic Compatibility (EMC) standard for radio equipment;

Part 17: Specific conditions for Broadband Data Transmission Systems

ETSI EN 301 489-17 V2.2.1 (2012-09)

FCC Regulatory Information

The FCC identifier for the radio module contained in the i-ALERT[®]2 device is **FCC ID: T7VPAN17**.

The radio module in the i-ALERT[®]2 device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407. Transmitter Operation is subject to the following two conditions:

1. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by ITT may void the user's authority to operate the equipment. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference

in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help

RF Exposure

To comply with FCC RF Exposure requirements, do not modify, remove or change the antenna on the radio module contained within the i-ALERT[®]2 device.

The radiated output power of the radio with mounted ceramic antenna (**FCC ID: T7VPAN17**) is far below the FCC radio frequency exposure limits. Nevertheless, the radio shall be used in such a manner that the potential for human contact during normal operation is minimized.

Industry Canada Certification

The radio module contained in the i-ALERT[®]2 device is licensed to meet the regulatory requirements of Industry Canada (IC), license: **IC: 216Q-PAN17**.

IC Notice

The radio module within the i-ALERT[®]2 device complies with Canada RSS-GEN Rules. The device meets the requirements for modular transmitter approval as detailed in RSS-GEN.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

European R&TTE declaration of conformity

The Bluetooth module contained within the i-ALERT[®]2 device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. As a result of the conformity assessment procedure described in Annex III of the Directive 1999/5/EC.

The i-ALERT[®]2 device can be used in the following countries: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, The Netherlands, the United Kingdom, Switzerland, and Norway.

Korean radio regulatory statement (Korea KC RRA)

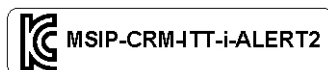


Figure 3: Korea KC RRA

Class	Notification
<p>A급 기기 (업무용 방송통신기자재)</p>	<p>이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.</p>

Figure 4: Korea Class/Notification

※ “해당 무선설비는 운용 중 전파혼신 가능성이 있음”이라는 문구를 등 설비의 잘 보이는 곳에 표시 할 것.

※ 제작자 및 설치자는 해당 무선설비가 전파혼신 가능성이 있으므로 인명안전과 관련된 서비스는 할 수 없음을 사용자 설명서 등을 통하여 운용자 및 사용자에게 충분히 알릴 것

Taiwan radio regulatory statement

低功率電波輻射性電機管理辦法

第十二條 經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條 低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。
前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

Figure 5: Taiwan radio regulatory statement

RoHS

China RoHS Table

Part Names 部件名称	Toxic and Hazardous Substances or Elements 有毒有害物质或元素					
	Pb 铅	Cd 镉	Hg 汞	Cr6+ 六价铬	PBB 多溴联苯	PBDE 多溴二苯醚
Enclosure 围端	○	○	○	○	○	○
Epoxy Resin 环氧树脂	○	○	○	○	○	○
Battery 电池	○	○	○	○	○	○
Printed Circuit Boards 印刷电路板	○	○	○	○	○	○
Hardware 五金件	○	○	○	○	○	○
<p>O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006</p> <p>X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006</p> <p>○: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下</p> <p>×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006标准规定的限量要求</p>						




Figure 6: China RoHS table

2 Product Description

2.1 General description i-ALERT[®]2 Condition Monitor

Description

The i-ALERT[®]2 Equipment Health Monitor is a compact, battery-operated monitoring device that continuously measures the vibration and temperature of the pump. The i-ALERT[®]2 Equipment Health Monitor uses blinking red LED and wireless notification to alert the pump operator when the pump exceeds vibration and temperature limits. This allows the pump operator to make changes to the process or the pump before catastrophic failure occurs. The Equipment Health Monitor is also equipped with a single green LED to indicate when it is operational and has sufficient battery life.

The i-ALERT[®]2 Equipment Health Monitor also contains a Bluetooth radio that communicates to certain Bluetooth 4.0 equipped devices through a mobile application.

Data is shared between the i-ALERT[®]2 Equipment Health Monitor, the mobile application, phone, and the data servers.

The i-ALERT[®]2 Equipment Health Monitor will communicate sensor related data (such as vibration, temperature, runtime information, and device statistics) stored in the device to the mobile application. The mobile application will send commands to the device.

The Mobile application will back up device data as well as app usage information on the data servers.

The data servers will send the mobile application equipment technical data.

For full details about data storage and rights please review the Privacy Policy.

Alarm mode

The i-ALERT[®]2 Equipment Health Monitor enters alarm mode when either vibration or temperature limits are exceeded over two consecutive readings within a 10 minute period. Alarm mode is indicated with 1 (one) red flashing LED within 2 (two) second intervals.

Warning and alarm values

Variable	Limit
Temperature (default)	80°C 176°F
Vibration Alarm (0.1-1.5 ips)	100% increase over the baseline level
Vibration Warning (0.1-1.5 ips)	75% increase over the baseline level

Battery life

The i-ALERT[®]2 Equipment Health Monitor battery is not replaceable. You must replace the entire unit once the battery runs out of power. The battery life is not covered as part of the standard 5-year pump warranty.

The following determines the “normal operating conditions” in which the 3-year battery life is determined:

- Temperature: 18°C | 65°F
- Dashboard connections (including trend download): Once per day
- FFT and Time Waveform usage: One tri-axial request per 14 days
- Operation time in Alarm: 25% of time

3 Installation

3.1 Installation

3.1.1 Attach the i-ALERT[®]2 Equipment Health Monitor to the pump



CAUTION:

Always wear protective gloves. The equipment and the i-ALERT[®]2 device can be hot.

Mounting options

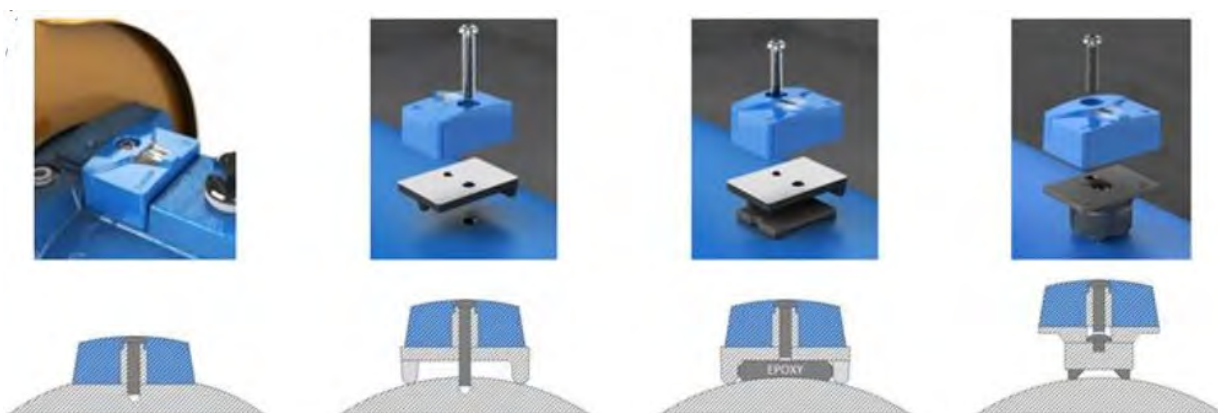


Figure 7: Mounting options

Mill a Slot	Drill and Tap	Epoxy ¹	Magnetic Mounting Adapter
Screw: 1/4-28 x 1.125in	Screw: 1/4-28 x 1.5in	Screw: 1/4-28 x 1.125in	Screw 1: 1/4-28 x 1.125in
Slot: 2.25in L x 1.6in W	Tap: 1/4-28 UNF x 1/4in deep	Epoxy: application specific	Screw 2: 1/4-28 x 0.75in
Temperature: ****	Temperature: **	Temperature: ***	Temperature: *
Vibration: ****	Vibration: ***	Vibration: ***	Vibration: **
Prep Time: **	Prep Time: **	Prep Time: ***	Prep Time: ****

Epoxy¹ Not included

Legend: ** = Good *** = Better **** = Best

Epoxy recommendation

The epoxy used should be a two-part putty in stick form (not liquid) type, which contains metallic particles in order to enhance heat transfer. Epoxy of this type is commonly found at hardware and home improvement stores. The temperature range required and specific application determine the epoxy choice. Mount i-ALERT[®]2 device to base using provided 1/4-28 cap screw. Torque screw to 6 lb-ft. using a 5/32" size Allen Head wrench prior to the application of the epoxy.

Location selection

The i-ALERT[®]2 device should be mounted on pumps or other rotating equipment as shown in the first image under "Mounting Options" (above) with the LED's aligned with the shaft in order to maintain the

preferred axis orientation shown below. Care should be taken to locate the device over the bearings, and to avoid placement on compliant surfaces such as coupling guards, and other light sheet metal. It is preferable to have one device over each bearing, but if that is not possible, monitoring the drive end is essential.

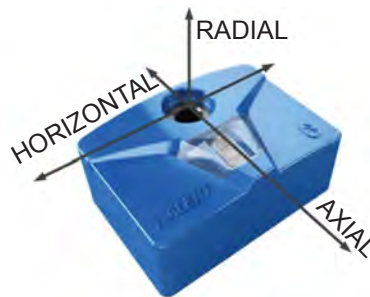


Figure 8: Location selection

The temperature seen by the i-ALERT[®]2 temperature sensor maybe different from the surface temperature of the object it is mounted to. Mounting the i-ALERT[®]2 directly to the machine will give the most accurate reading. The differences are due to the temperature gradient that exists between the i-ALERT[®]2 and the machines surface. This gradient can be greater when the ambient temperature is very different from the surface temperature.

Table 1: Temperature difference based on mounting method

Mounting method	Approximate difference in temperature reading
i-ALERT [®] 2 directly mounted to machine	-11°C -20°F
I-ALERT [®] 2 mounted on adapter	-22°C -40°F

App installation and registration

For installation guidance, video links can be found at the following site:

<http://www.itproservices.com/aftermarket-products/monitoring/i-alert2-condition-monitor/>

To download the latest App, search for" i-ALERT[®]2 condition monitor" in the Apple App Store.



To access the App it is necessary to create an account using a valid email in the registration tab on the login page.

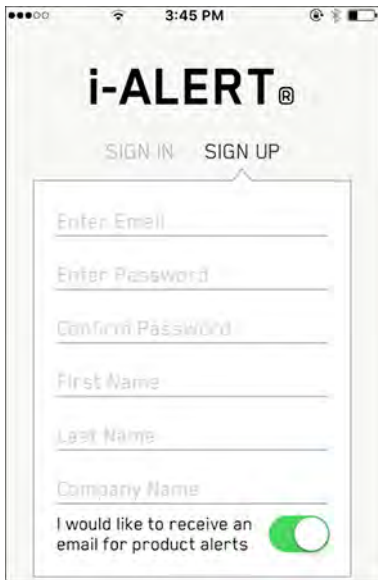


Figure 9: i-ALERT®2 registration

4 Commissioning, Startup, Operation, and Shutdown

4.1 Activate the i-ALERT[®]2 Equipment Health Monitor



Figure 10: i-ALERT[®]2 Equipment Health Monitor activation

Steps to activate the i-ALERT[®]2 Equipment Health Monitor

1. Remove the sticker.
2. The i-ALERT[®]2 will look for light.

NOTICE:

If in a dark environment use light source to activate.

3. When activated a sequence of flashing LEDs will start to indicate that the unit is powered on.
4. When sequence is completed the green LED will flash every 5 sec under normal operating conditions.



WARNING:

- Contains Lithium battery.
- Do not crush or disassemble.
- Never heat the condition monitor to temperatures in excess of 100°C | 212°F. Heating to these temperatures could result in death or serious injury.



CAUTION:

Always wear protective gloves. The pump and condition monitor can be hot.

4.2 Reset the i-ALERT®2 Equipment Health Monitor

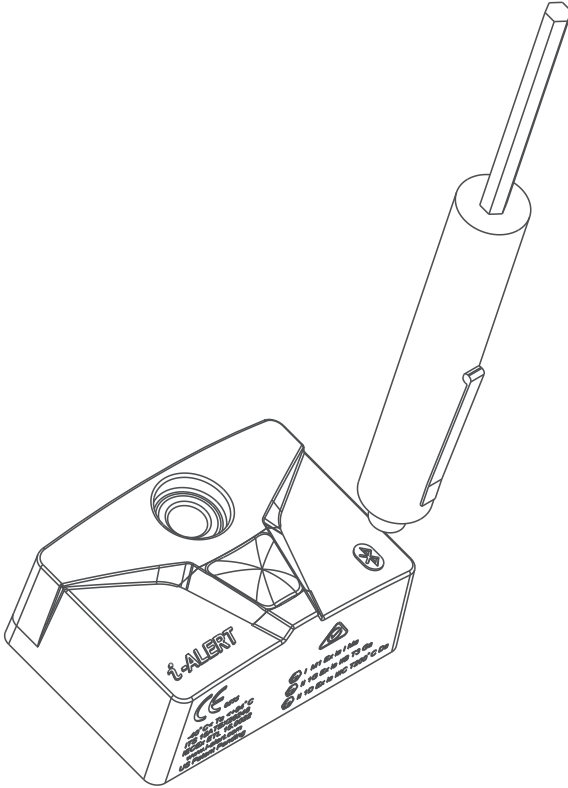


Figure 11: i-ALERT®2 Equipment Health Monitor reset

The LEDs correspond to an i-ALERT®2 Equipment Health monitor function.

When using the magnet over the Bluetooth icon you can change an i-ALERT®2 Equipment Health monitor function. Lifting a magnet off on an LED will

Sequence	LED	When you lift the magnet off
1	Red	Nothing
2	Blue	Bluetooth is turned OFF/ON
3	Green	Unit is shut down
4	After flashing all colors stops	Unit is reset

4.3 i-ALERT®2 Equipment Health Monitor routine operation

Measurement interval

The measurement interval for the condition monitor during normal and alarm operation is 5 minutes.

When the monitor measures a reading beyond the specified temperature and vibration limits, the appropriate red LED flashes (after 2 consecutive readings). After the process or pump condition that causes the alarm is corrected, the condition monitor returns to normal mode after one normal-level measurement.

Alarm mode

The condition monitor's alarm mode is activated after two consecutive readings. When the alarm mode is on, you should investigate the cause of the condition and make necessary corrections in a timely manner.

Magnetic device considerations

Be careful when you use magnetic devices in close proximity of the condition monitor, such as magnetic vibration-monitoring probes or dial indicators. These magnetic devices can accidentally activate or deactivate the condition monitor resulting in improper alarm levels or loss of monitoring.

Wireless integration

A Bluetooth Low Energy Radio is utilized to communicate condition monitoring information to a mobile Smart device that the operator can easily view and react to.

5 Maintenance

5.1 Guidelines for i-ALERT[®]2 Equipment Health Monitor disposal

Precautions

**WARNING:**

- Never heat the condition monitor to temperatures in excess of 100°C | 212°F. Heating to these temperatures could result in death or serious injury.
 - Never dispose of the condition monitor in a fire. This could result in death or serious injury.
-

Guidelines

This Product Contains Lithium Thionyl Chloride therefore the local Waste management companies can provide assistance in the disposal of the device that contain this type of battery.

6 Troubleshooting

6.1 i-ALERT[®]2 Equipment Health Monitor troubleshooting

Symptom	Cause	Remedy
There are no red, green, or blue flashing LED.	The battery is dead.	Replace the equipment health monitor.
	The unit is in sleep mode.	Activate the condition monitor using magnet.
	The unit is malfunctioning.	Consult your ITT representative for a warranty replacement.
The red LED is flashing, but the temperature and vibration are at acceptable levels.	The baseline is set below normal operating limits.	Check the temperature and vibration levels and request new baseline. Or manually change alarm limits.
	The unit is malfunctioning.	Consult your ITT representative for a warranty replacement.

For connection issues with smart devices, please visit www.i-ALERT.com

For ITT's privacy Policy, click here: <http://i-alert.com/support/app-privacy-policy/>

For User SW License Agreement, click here: <http://i-alert.com/support/i-alert-user-license/http://i-alert.com/support/app-privacy-policy/>

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**Visit our website for the latest version of
this document and more information:**
<https://www.i-alert.ai/>



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