

Delta T Alert

1. Introduction

a. Hardware

- i. The Delta T Alert system is built around a family of devices that are easy to deploy into any variety of environments to quickly build and manage the condition of your critical assets. The system operates by using sensors monitoring ambient and enclosure temperature to create temperature differential (Delta T) readings showing the comparative emitted temperature of your critical assets. These conditions, along with humidity and other readings can quickly determine if your equipment's condition is deteriorating. This information is then broadcast via secure Z-Wave wireless chip to a gateway on a local or remote network and back to your computer to be displayed as an alarm.

b. Software

- i. During operation the software runs in the background on a Windows based PC. Once the software has received an alarm, all desired personnel are notified via email. Reports and inspection lists can be generated to provide to your staff to support the planning process for your routine maintenance.

2. Goal / Intent

- a. The Delta T Alert system is intended to provide you with the ability to monitor the condition and efficiency of your equipment with cost effective installation and minimal maintenance required. The system can be deployed rapidly and on a wide scale of network options for local and remote (global) coverage. Typical calendar based maintenance often makes assumptions based on previous inspections, but the world of maintenance is not always predictable. Even with the best programs small faults and defects can cause the rapid deterioration of critical assets. With the Delta T Alert system combined with an existing maintenance plan, you can target critical asset faults long before they become an issue.

3. Setup

a. Software

i. Application and Use

1. The Delta T Alert system is a maintenance monitoring application which uses multi-point sensors to monitor the condition of critical assets and equipment throughout your building and even at remote locations. Sensors are connected to parent gateways, which in turn use either a remote connection (internet or GSM) or local area connection to communicate back to the Delta T Alert software, providing instant access to monitoring device as well as scheduled reports and alarms. This, combined with routine maintenance, can provide safe and secure operation for your facility.

ii. Installation

1. At any time, the software can be downloaded free of charge on the IRISS website (<http://www.iriss.com/dtasetup>). Simply run the startup.exe to launch the installation process on your local machine. Please be aware that this machine will be the host of your entire system

and should be located on the same network as any intended local gateways.

b. Hardware

i. Gateways

1. Specifications

- a. Delta T Alert Gateways (Local and Remote) require power and an Ethernet access point and must be placed within 300ft LoS (Line of Sight) of their respective child sensors. This range can be impeded by barriers such as metal structures or equipment, drywall, concrete and other substances, reducing effective indoor range. We recommend indoor placement between the Gateway and Child sensors should not exceed 50ft for optimal communication and signal strength.

2. Local

- a. Local Gateways must be located on the same network and subnet as the host computer running the Delta T software. When installing a gateway, be sure to take note of the gateway's HomeID, listed on the back of the unit and make sure that this ID is accessible or saved for future use before mounting the device.

3. Remote

- a. Remote Gateways do not need to be on the same network as the host computer; instead, they simply require a stable internet source from anywhere in the world. This can be within another network even if that network has a firewall. In addition, a variety of cellular options can be implemented for full freedom of placement in areas with no other form of internet access. Remote Gateways are identified by their Remote ID as listed on the sensor. Make sure that this value is recorded for future use before mounting or placing the gateway, especially in an inaccessible location.

4. Installing Gateways

- a. Note that it is necessary to have at least one active gateway before any sensors can be added to your Delta T Alert system. See section 5.b

ii. Sensors

1. Specifications

a. Delta T Alert Standard Sensor

- i. The standard Delta T Alert Sensor includes an Ambient and Enclosure temperature sensor to create a temperature differential, along with a humidity sensor. The sensor is powered by three standard AA batteries and can maintain up to eight (8) schedules per day for

18-24 months before battery replacement may be needed.

b. Delta T Alert Pro Sensor

- i. The Delta T Alert Pro Sensor includes an Ambient and Enclosure temperature sensor to create a temperature differential, along with a humidity sensor and auxiliary port for a remote thermocouple. The sensor is powered by mini USB and can maintain up to eight (8) schedules per day. The auxiliary port can be used for additional alternative sensors and expansion boards. This sensor is powered by a USB cable and 5V power supply.

c. Delta T Alert Legacy Sensor

- i. The legacy Delta T Alert Sensor includes an Ambient and Enclosure temperature sensor to create a delta. The legacy sensor does not contain a humidity sensor. The sensor is powered by three AA batteries and can maintain up to eight (8) schedules per day for 18-24 months before battery replacement may be needed.

2. Adding Sensors

- a. When adding a Sensor to the system (see software instructions) you will be instructed to press the learn button on the front face of the sensor. You may use the provided Delta T Alert tool or any elongated implement (eg. paperclip) to give the button one quick press. In the unlikely event this does not work, you can also attempt to add a sensor through a triple click to force the sensor add process.

3. Configuring Sensors

a. Schedules

- i. When adding a sensor, you may select “Manual Setup” to select specific settings for your desired sensor or “Continue” to use the default settings established in your software’s Sensor Settings menu.

b. Alarms

- i. Alarms can be set within the sensor or the sensor default settings before adding the sensor. This allows you to set the following alarms.
 - 1. **Indicate:** Indicates probable deficiency, repair as time permits.
 - 2. **Monitor:** Monitor until corrective measures can be accomplished.
 - 3. **Major:** Major discrepancy, repair immediately.
 - 4. **Critical Reporting:** Designates a point at which minute by minute auto polling should occur.

c. Notifications

- i. Allows you to set which notifications you would like to receive from this sensor when such events occur. Audible alarms and other notifications can also be disabled here.

4. Software Features and Operation

a. Normal View

i. UI Overview

1. DIAGRAMS

ii. Menu Options

1. Views

a. Normal View

- i. The normal view is where the software is actively listening to sensors and graphing Data. The system should be in this state at all times unless sensors or gateways are being added/removed or system settings are being modified.

b. Admin View

- i. The admin view is where all settings are set and configured across the Delta T Alert software. This is also the area where firmware updates are performed and reports are generated.

b. Admin View

i. UI Overview

1. DIAGRAMS

ii. Menu Options

1. System

a. Sensors

i. Add

- 1. Add new sensors to your system. Using this option will take you through the process of adding sensors in which you will select the desired gateway nearest to your sensor, and choose your desired configuration options.

ii. Remove

- 1. Remove an existing sensor from your system. You will be asked to select a gateway near the location of the sensor (This does not have to be the sensors actual parent gateway). This option can also be used to remove sensors repurposed from other systems or damaged sensors to clear their previous ownership and memory.

iii. Delete

- 1. In the instance where a sensor cannot be removed due to the sensor being damaged or

inaccessible, it can be removed from the system table by using this feature. NOTE: The sensor will continue to operate normally even after removed and may need to be 'removed' from a system before it can be re-added to another Delta T Alert platform.

b. Gateways

i. Add

1. Add a new gateway to your software. You will be prompted to choose to search for Local or Remote gateways.
2. Local gateways must exist on the same network and subnet as the computer currently running the Delta T Alert software. This will scan your local area network for Z-Wave gateways. Select your desired device by HomeID (found on the back label of the gateway). Once it has finished scanning and you have selected the gateway, you may click the plus (+) sign to add the gateway to the system. This gateway may then be used to add new sensors at its location.
3. Remote gateways may be added from any internet accessible location across the world. When selecting remote gateway, you will be prompted to input the gateways Remote ID, which matches the gateway's MAC address listed on the back of the device. After scanning for gateways, you will be prompted to select the desired gateway and add it to your software.
4. Gateways can be managed in the settings menu.

ii. Remove

1. Select from a list of existing gateways. The chosen gateway and all associated sensors belonging to that gateway will be removed upon completion.

iii. Reset

1. In the instance where a gateway must be reset for transfer to another system or for a maintenance issue, the gateway can be selected and reset remotely using this option. Please note that all sensors associated to that gateway will also be removed from the system.

- c. Data
 - i. The Data Editor is a location where data can be manually adjusted and edited in the event that data containing errors was collected. In this way, the user can correct future reports and exclude erroneous data.
 - d. Sensor Updates
 - i. To update sensors to a newer version of firmware, select this option to see a list of all sensors and their known version numbers. Multiple sensors from a site can be selected along with the version of choice. These options are automatically synced to your software from the IRISS Cloud. Upon selecting your desired sensors you will receive an estimated time of completion for the update process. NOTE: Sensors will not be able to perform alarms or scheduled reports during the update process. As such, you may want to perform updates to occur in times when regular data collection is not scheduled.
 - 1. DIAGRAM
 - e. System Health
 - i. Opens a new window, displaying gateway and sensor information and statistics, along with details regarding your computer and the Delta T Alert software.
 - 1. DIAGRAM
- ## 2. Settings
- a. Settings
 - i. Company Info
 - 1. The company info section allows you to specify your company and contact information to be used in email notifications and report letterheads. **Important** To ensure that you receive emails and can restore your password if necessary you **MUST** assign an email address on this page. This email address will be used for password recovery if necessary.
 - ii. Password
 - 1. Here you can set your admin password to restrict access to important sensor settings and configurations. **Important** To ensure that you receive emails and can restore your password if necessary you **MUST** assign an email address on the Company Info menu page.
 - iii. Temp Units

1. Choose between Celsius or Fahrenheit units, please note that this change will not affect previous readings retroactively.
- iv. Gateway Configure
 1. This menu allows you to review all the gateways currently attached to your system. You may rename the gateways as desired in this menu by pressing the Apply button on the bottom of the window.
- v. Default Settings
 1. Default sensor schedules, email notifications, email options, alarms and other settings can be configured here to apply to any future Delta T Sensors added to your system.
 2. Each sensor can be assigned up to eight scheduled events in which the sensor will awaken from sleep mode to report back to the software automatically.
 3. Email Notifications: Each individual sensor can be assigned different notifications depending on its purpose. These notifications range through the three alarm states as well as “low battery” and “no communication”, which will be submitted for each occurrence to your designated email address.
 4. Email Options: Determine who should receive notifications from this sensor. Multiple emails can be added by separating addresses with a comma.
 5. Audible Alarm: By default, sensors are set with their audible alarms active. In the instance where sensors will be placed in areas without foot-traffic or where the alarm would be inappropriate, the feature can be disabled.
 6. Alert Notification Reference Temperature: Designates which value the sensor will base its alarm states on.
 - a. Delta T: Alarms will trigger when the delta temperature (difference between ambient and enclosure) exceeds the alarm levels.
 - b. Enclosure / Ambient: Alarms will trigger when the air temperature for the desired sensor exceeds this value.

7. Temperature Direction: Whether alarms should trigger when values are lower, or higher, than what the sensor is currently reading.
- vi. DeltaT
 1. Default temperature settings for sensors configured to monitor Delta Temperatures.
 2. Three levels can be set, Indicate, Monitor, and Major deficiency (yellow, orange, red).
 3. NETA Defaults: This option will automatically configure the settings to match NETA (International Electrical Testing Association) standards.
- vii. Enclosure/Ambient
 1. Default temperature settings for sensors configured to monitor ambient or enclosure temperatures.
 2. Three levels can be set, Indicate, Monitor, and Major deficiency (yellow, orange, red).
- viii. Network Mode
 1. Z-Wave devices are able to create a communication mesh network between sensors to ensure that information is carried back to the host gateway. This feature must be enabled on the software and each sensor in the system that will make use of the configuration. Please note that this will greatly increase battery consumption on Delta T Standard or Legacy sensors.
- ix. Demo Mode
 1. This feature switches the software into demo mode, polling each sensor in the list in sequence once every minute. This is intended to build up data quickly for demonstrations and short term stress testing. Battery life will be greatly affected if Demo Mode is maintained for long periods of time.
- x. Reports
 1. The reports settings window allows you to calibrate what kind of reports you would like to receive from the system and at what frequency.
 2. Users may select mini-reports, which will send an excel copy of their software's system table and all current sensor stats at an interval selected by the drop down.

3. They may also pick any of the full reports as desired.
 4. Users may also select 'Recover Last Missed' which will submit a new full report for that time period if the software crashed during operation.
- xi. Start up
 1. These settings allow the user to add or remove the software from Startup, which allows it to launch as soon as a user logs into that machine.
- xii. Configuration
 1. Users can alter the location where reports will be stored after generation for optimized organization and import into various Building Management Software (BMS) systems and tools.
- xiii. Data Control
 1. Allows the user to set warnings when your local database and backup folders have exceeded the allocated memory size on your computer.
- b. Sensor Configuration
 - i. This window allows users to select multiple sensors and update each one with the same settings as selected in the three tabs (sensors, notifications, sensor mode) to rapidly change sensor configurations.
- c. Open Log
 - i. This feature allows you to review the system log of the Delta T Alert software, showing software operations such as reports, scheduled sensor readings, software activation and more.
- d. Create and Restore Backup
 - i. These two options allow you to create backups which can be used to restore your system to a previously saved state. NOTE: Hardware changes such as removed sensors or gateways cannot be restored as their hardware settings have been overwritten.
- e. Appearance
 - i. The appearance editor allows you to customize the color scheme and appearance of the software to match your company colors and font if desired.
- f. Data Management
 - i. This feature contains multiple tools for monitoring and clearing memory consumed by the Delta T Alert software across a wide array of areas ranging from memory backups to database information to ensure

unnecessary files do not consume unnecessary space on your hard drive.

g. System Reset

- i. Resets all system settings and hardware. This will restore your system to its factory settings, clearing all records of sensors and gateways to allow you to start from a fresh installation. NOTE: This change cannot be undone.

3. Reports

a. System Report

- i. Generates a report of the existing system, sensors, and their status. This information will be the last reported states matching your present system table. This can be exported in two formats, PDF (Adobe acrobat) and XLS (Excel).

b. Inspection Report

- i. An inspection report can be generated for your maintenance team creating a list of all sensors reporting alarm states (indicate, monitor, major, non-communication and low battery) along with information on the sensor and its location. The inspection report is provided in a printable format to be filled out by the maintenance team.

c. Full / Weekly Scan

- i. These two options allow you to generate an excel report containing all data gathered across all sensors, location, and sites over the last seven days.

d. Custom Report

- i. This feature opens a window allowing you to generate a report based on selectable start/end date, sites, locations, and desired sensors. This report will contain information from all the desired sensors selected between those date ranges in an Excel exportable format for further analysis.

e. Alerts

- i. This option will allow you to open a window showing you all active unacknowledged alarms received by your sensors. This table can then be organized and managed to handle any alarms you have received.

4. Help

a. How it Works

- i. Link to a visual setup and user guide of the Delta T Alert system.

b. Instructions

- i. Link to a printable sensor and gateway setup guide.
- c. Warranty
 - i. Link to IRISS Delta T Alert Warranty information.
- d. Contact
 - i. Opens IRISS's Contact Us web page.
- e. About
 - i. Lists the current software version along with update information and IRISS HQ Location details.
 - ii.

FCC Part 15.19 Warning Statement
THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. 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 UNDESIRE OPERATION.
FCC Part 15.21 Warning Statement
NOTE: THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.
FCC Part 15.105(b) Warning Statement
<p>NOTE: 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:</p> <ul style="list-style-type: none"> - 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.
IC RSS-GEN, Sec 8.4 Warning Statement
<p>ENGLISH:</p> <p>This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.</p>

FRENCH:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.