MANAGING ALERTS FROM THE CHECKPOINT WIRELESS MONITORING SYSTEM

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
LABORATORY

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TABLE OF CONTENTS

1.0 SCOPE AND APPLICATION 3
2.0 LOGGING INTO CHECKPOINT 3
3.0 EQUIPMENT AND ALERT GROUPS 4
4.0 TWENTY-FOUR HOUR ALERT EQUIPMENT GROUPS 5
5.0 MANAGING ALERTS 6
6.0 CORRECTIVE ACTION IN PROGRESS 11
7.0 SYSTEM VERIFICATION / VALIDATION 12
8.0 ANNUAL PROBE RECALIBRATION 13
9.0 TROUBLESHOOTING SENSOR CONNECTIONS 14
10.0 NOTES 21

FIGURES AND TABLES

Figure 1 - CheckPoint Login Screen 4
Figure 2 - CheckPoint Dashboard & System Status 6
Figure 3 - "Graph It" 7
Figure 4 - Temperature Plot 7
Figure 5 - Take Corrective Action 8
Figure 6 - Diagnosis Problem Documentation 9
Figure 7 - Corrective Actions - Detailed Summary 9
Figure 8 - Document Corrective Action Taken 10
Figure 9 - User's Electronic Signature 10
Figure 10 - Alert Moved to Corrective Action in Progress 11
Figure 11 - Corrective Action in Progress Follow Up 11
Figure 12 - Probe Expiration Dates 13
Figure 13 - Edit Equipment 14
Figure 14 - Set Temperature Thresholds 14
Figure 15 - Sensor Button 15
Figure 16 – Repeater and Access Point Status 16
Figure 17 - Access point hardware 16
Figure 18 - Repeater hardware 16
Figure 19 - Checkpoint Alarm Test Log Sheet 19
Figure 20 - Roof Compressor Diagram 21

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Table 1 - Equipment Groups 4
Table 2- Limits and Locations for Refrigerators and Freezers 5
Table 3 - Recommended Annual System Validation & User Training 20

1.0 SCOPE AND APPLICATION

The DEP Central Laboratory uses a CheckPoint Wireless Monitoring System to monitor numerous appliances that must be maintained within specific temperature operating conditions. CheckPoint measures temperature, and other vital parameters, and an alarm will activate when the monitored parameters exceed specific thresholds for more than a pre-set acceptable period of time. The CheckPoint system is principally used to collect temperature metadata and to monitor temperature conditions; it is not used for calibration purposes, even though probe calibration is discussed in this SOP and in references within.

When an alarm activates, CheckPoint alerts users so that corrective action can be taken to save samples at risk of damage or total loss. Samples in the affected unit must be evaluated and reported as appropriate. Qualification of data due to lack of refrigeration is determined by SOPs, methods, and the best professional judgement of the work group manager and senior analysts. CheckPoint electronically stores monitoring data and corrective actions in an SQL database.

2.0 LOGGING INTO CHECKPOINT

2.1 Log into CheckPoint software by entering username and password (**Figure 1**).

2.2 Contact Scientific Services Support for password information or if an account is locked due to inactivity.

2.3 If using a DEP laptop from a remote location, sign into DEP VPN, and then log into CheckPoint.

2.4 If using a personal computer at a remote location, visit https://rdweb.wvd.microsoft.com/webclient/index.html In the home search bar, enter "remote desktop". Enter DEP username and enter computer LDS number.. For more instructions to access DEP resources remotely, visit DEP Remote Access Resources - VPN and Azure Virtual Desktop | DEPNET (floridadep.net).

Note: Your office computer must be on to access Remote Desktop Services.

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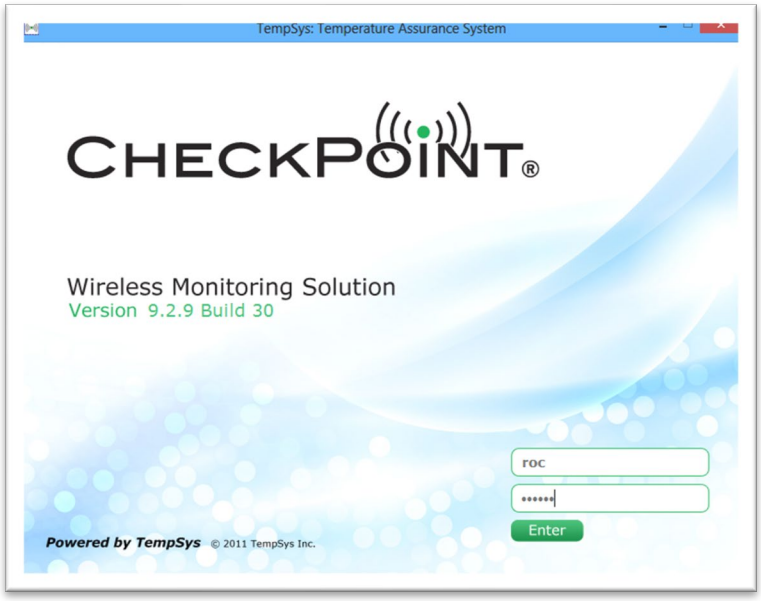


Figure 1 - CheckPoint Login Screen

3.0 EQUIPMENT AND ALERT GROUPS

3.1 CheckPoint (Tempsys) Temperature Assurance Software Program - Version 9.3.11 Build 27, Database revision 2013198 (or more recent updates)

3.2 Access Points and Repeaters - A total of five access Points (CP-G4-Access Point-v4-41005) and five Repeaters (CP-G4-Repeater-41002) are positioned within the laboratory for wireless networking.

3.3 Sensors and Probes - CP-G4-E15 Sensors equipped with SS probe (-40 to 125 ºC) and G4 door access (where needed). A low temperature sensor 42007-L is used for -80ºC applications.

3.4 Fluke 7103 Temperature Calibration Micro-Bath (or equivalent) - Refer to SOP **LB-035** for operational instructions.

3.5 Appliances with CheckPoint probes are assigned to Equipment Groups based on laboratory sections and temperature monitoring requirements. An appliance can only be assigned to one Equipment Group. Equipment Groups are listed in **Table 1**.

Table 1 - Equipment Groups

CheckPoint Equipment Groups	
24 Hour Alert - Biology	Bench
24 Hour Alert - Nutrients	Inorganics-Metals
24 Hour Alert - Organics	Molecular
24 Hour Alert - Shared	Organics
24 Hour Alert - Soils	PM 2.5

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Lab staff can be a member of multiple Equipment Groups. To view Equipment Group members and assigned appliances select *Settings* → *Groups\Email Escalation* from the menu bar, select the group of interest from the list and click the *Edit* button. Staff may elect to receive emails or text message alerts for the appliances in an Equipment Group. To modify Email or Alert Groups, select *Alerts* →*Email & Lamp Groups* from the menu bar, right click the group of interest and select *Edit*.

4.0 TWENTY-FOUR HOUR ALERT EQUIPMENT GROUPS

4.1 Eleven appliances used for sample storage (**Table 2**) are assigned to 24 Hour Alert Equipment Groups. Chemistry and Biology supervisors rotate 24-hours a day on-call shifts every two weeks to ensure that alerts from these appliances are immediately addressed.

Table 2- Limits and Locations for Refrigerators and Freezers

Unit ID	Room	Temperature Range	Time Outside Range Before Alarm Activates
Refrigerator 1	C301	0 to 6.0 °C	2 hours
Refrigerator 4	C301	0 to 6.0 °C	30 minutes
Refrigerator 5	C301	0 to 6.0 °C	30 minutes
Refrigerator 6	C301	0 to 6.0 °C	2 hours
Refrigerator 7	C301	0 to 6.0 °C	2 hours
Refrigerator 8	C301	0 to 6.0 °C	2 hours
Biology Walk-in Freezer	B227	-30.0 to -15.0 °C	30 minutes
Biology Walk-in Refrigerator	B227	1 to 6.0 °C	30 minutes
Refrigerator 10	C201	0 to 6.0 °C	30 minutes
Refrigerator - sliding door	C201	0 to 6.0 °C	30 minutes

4.2 The supervisor on-call rotation shift schedule is maintained in the "Alarm On-Call" calendar in Outlook Shared Calendars and can be updated as needed. Use the "Alarm On-Call" calendar to adjust the "On-Call (Biweekly)" Alert Group in Checkpoint when the on-call shifts rotate. To edit the On-Call (Biweekly) Alert Group, select *Alerts*→*Email & Lamp Groups* from the menu bar. Double-click the On-Call (Biweekly) Email group and drag and drop recipient emails or phone numbers as needed. **On-call supervisors are advised to leave their office computers on during their shift to access Checkpoint via RDS or bring laptops home. .**

4.3 When an alarm condition occurs in an appliance listed in Table 2, both a text message and email alert are sent to designated responders to notify them of the alarm so that

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corrective action can be taken. On any given day, two supervisors are on call and must respond to these alerts. If a supervisor is unable to perform on-call duties it is his/her responsibility to recruit another supervisor to cover their shift and also to edit the "On-Call (Biweekly)" Alert Group in CheckPoint (see section 4.2).

5.0 MANAGING ALERTS

5.1. If an email or text alert is received, log into CheckPoint.It is important to address alerts in a timely manner. The program will not repeat an alert for the same equipment if such an alert already exists. Current alerts and a list of equipment viewable by the user is displayed on the dashboard. Locate the sensor of interest in the "Current Alert" window (**Figure 2**). The color-coding for each sensor is: **Green** = Within range; **Red** – Above upper threshold; **Blue** – Below lower threshold.

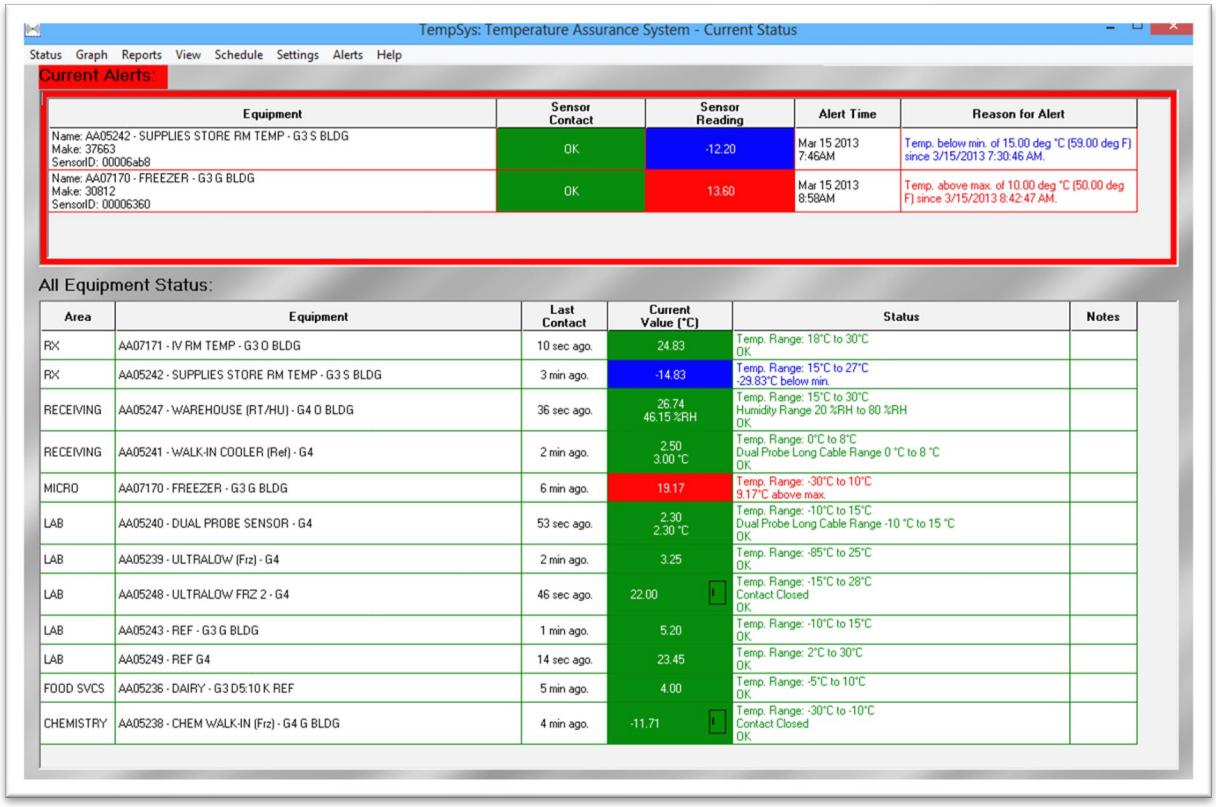


Figure 2 – CheckPoint Dashboard & System Status

5.2. Generate a graph for the appliance in alarm status. In the Current Alerts window, right click the sensor of interest and select "Graph It" (**Figure 3**).

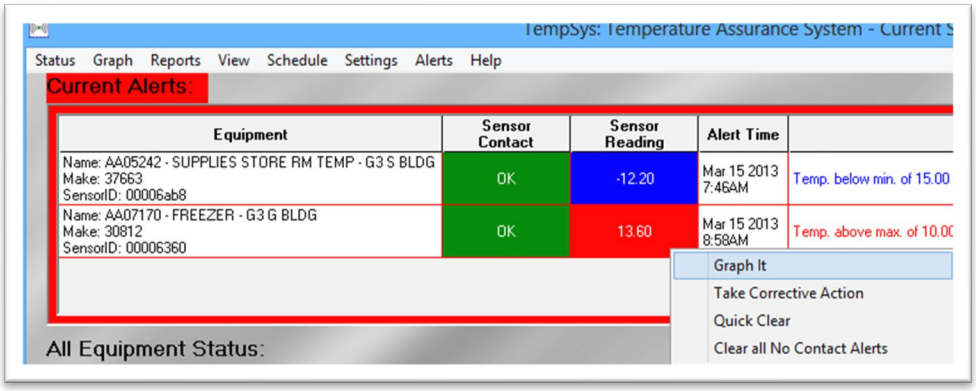


Figure 3 - "Graph It"

The graph in **Figure 4** illustrates that the temperature exceeded the upper threshold triggering an alarm.

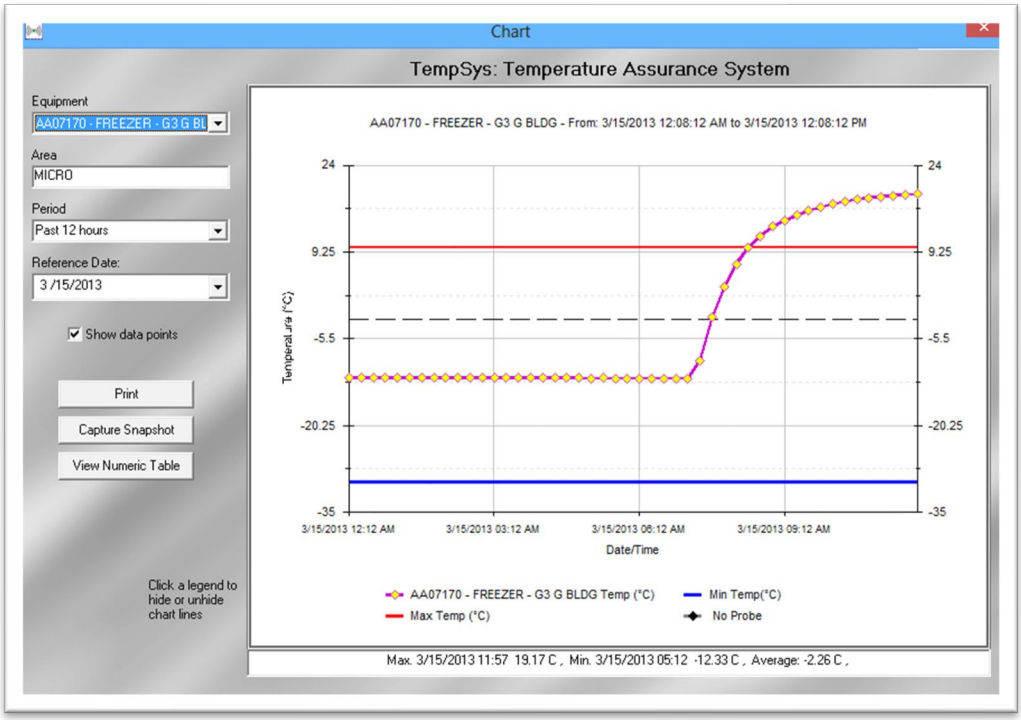


Figure 4 - Temperature Plot

5.3. If possible, physically inspect the appliance to determine the cause of the alarm (e.g., door left open), and correct the issue. If an on-call supervisor determines that repairs are required outside of business hours, contact the appropriate company. For units listed in Table 2, contact Brown's 24-hour service: (850) 877-2226. If needed, **Figure 20** on page 21 for a diagram of rooftop compressor units.

5.4. Move samples, as necessary. Many Chemistry samples cannot be stored outside their required temperature range for more than 8 hours. If a unit cannot be repaired within that timeframe, transfer the samples to alternate storage locations. Additionally, efforts should be made to move items as described below.

- Samples in most small refrigerators may be moved to the larger walk-in refrigerators.
- Do not transfer samples to refrigerator 9. This unit is used for storage of highly contaminated, flammable waste samples.
- Do not move volatiles analyses (S-VOC.., W-VOC, etc.) samples to either the Biology walk-in refrigerator or refrigerator 5. VOC samples may be stored in Receiving-C301 Refrigerator 10 or B345-VOC Refrigerator.
- Do not move empty sample containers. If storage space is limited, do not move samples that were collected more than 28 days prior.
- The walk-in freezer contains mostly fish samples and chlorophyll filters. The filters and fish tissue samples can be placed on ice, in a closed cooler in the Biology walk-in refrigerator. Tox has some *C. dubia* food items in the walk-in freezer that can be placed in any available refrigerator if need be.

5.5. Take Corrective Action. After addressing the issue causing the alarm (e.g., closing a door that was inadvertently left open), return to the Check Point dashboard, right-click the sensor of interest, and select "Take Corrective Action" (**Figure 5**).

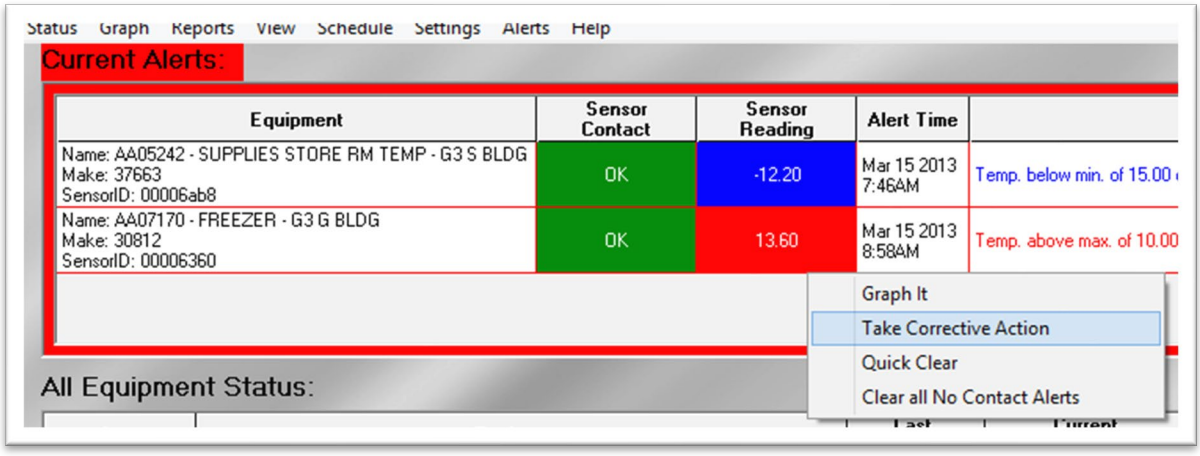


Figure 5 - Take Corrective Action

5.5.1. In the Diagnose Problem screen (**Figure 6)**, check all boxes that apply regarding the alarm and corrective action taken and click Next>>.

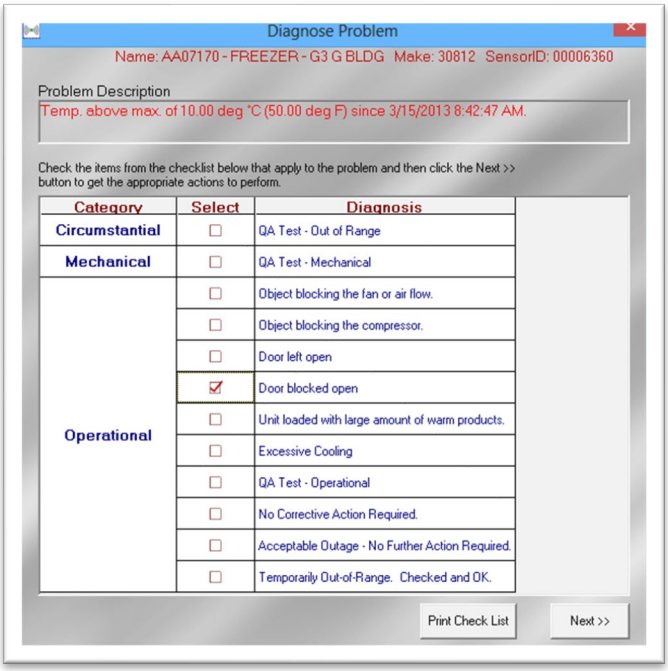


Figure 6 - Diagnosis Problem Documentation

5.5.2. Review the Corrective Actions screen (**Figure 7)**, which provides a detailed summary of the appliance that was in alarm status and the corrective action taken. The Corrective Action in the message box can be customized to contain specific instructions (e.g., "Contact John Smith at 123-456-7890 for further assistance."). Click Next>>.

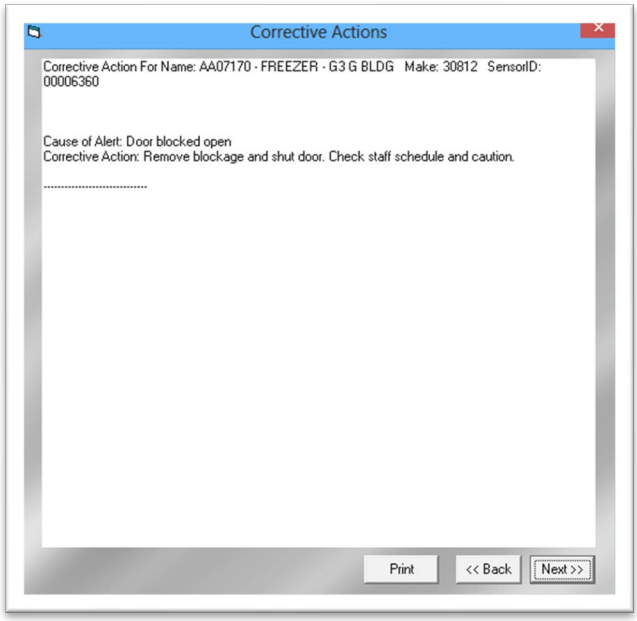


Figure 7 - Corrective Actions - Detailed Summary

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5.5.3. Enter in the name and condition of the sample(s) in the upper box, and document the corrective action taken in the lower box (**Figure 8)**. Document all information to ensure compliance with regulatory and QA requirements. Select the appropriate radio button for "Is the equipment working properly": "**Yes**" fully dismisses the alarm with no further action required; "**No**" moves the alert to the "Corrective Action in Progress" window for further follow up. Click Save.

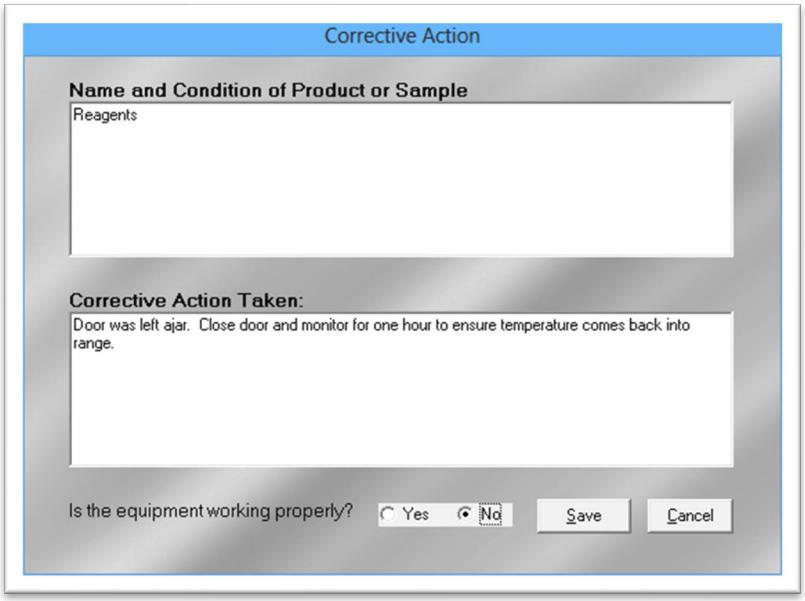


Figure 8 - Document Corrective Action Taken

5.5.4. If "Yes" is selected, Check Point will prompt the user for their electronic signature (**Figure 9**) and deactivate the alarm. Any recurring alarms are new issues that must be addressed. Check the dashboard to ensure that the alert has been removed from the "Current Alerts" box.

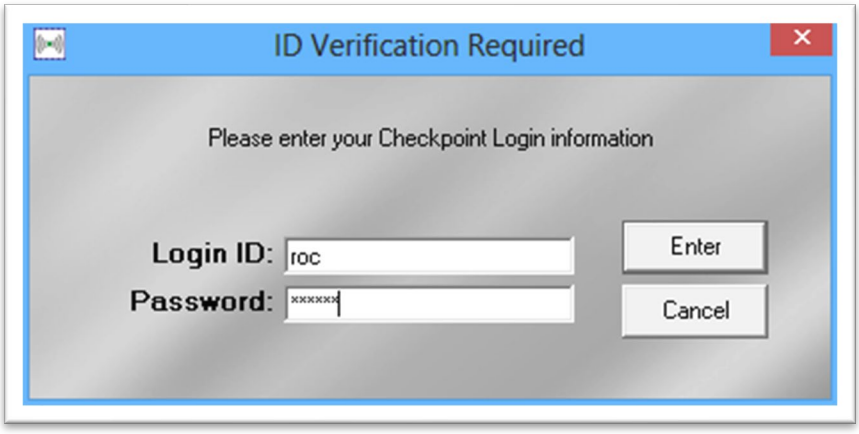


Figure 9 – User's Electronic Signature

5.5.5. If "No" is selected under "Is equipment functioning properly?" the alert will be moved to the Corrective Action in Progress window for further follow up (**Figure 10)**.

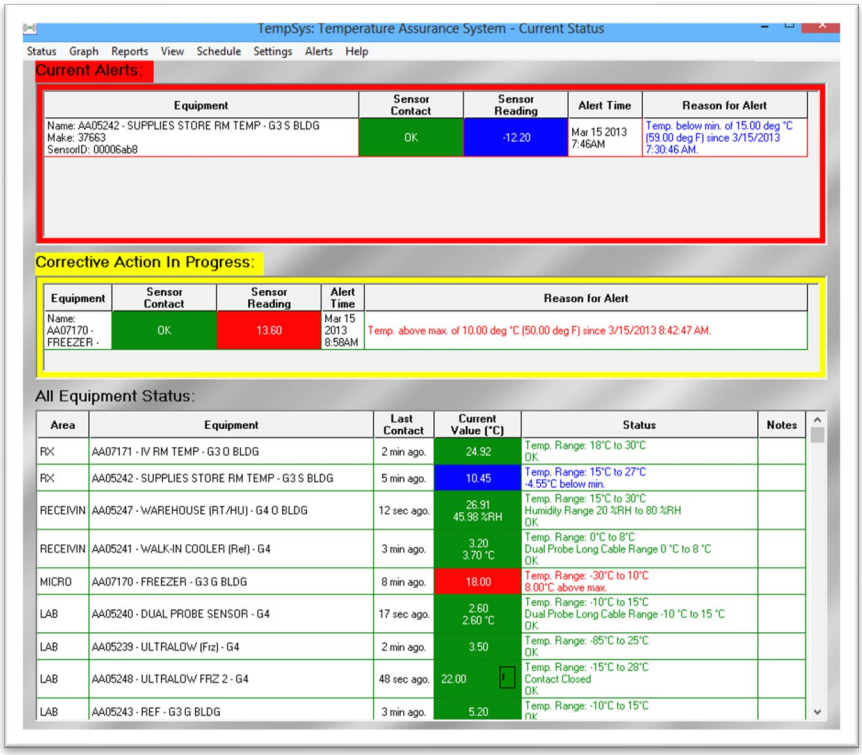


Figure 10 - Alert Moved to Corrective Action in Progress

6.0 CORRECTIVE ACTION IN PROGRESS

6.1 To follow up on an alert that has been moved to the Corrective Action in Progress window, right click on the equipment of interest, and select "Process Further" (**Figure 11**).

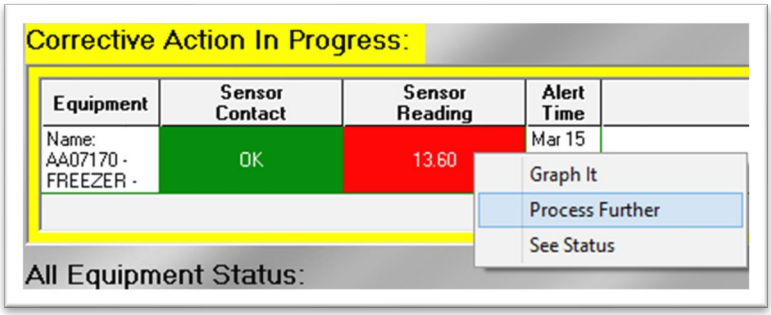


Figure 11 - Corrective Action in Progress Follow Up

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Enter relevant information to finalize the corrective action documentation (see **Figure 8**). As with clearing current alerts, an electronic signature is required to complete a corrective action follow-up. When all alerts are addressed, CheckPoint displays "All Equipment Safe. No Alerts".

7.0 SYSTEM VERIFICATION / VALIDATION

Perform regular checks as described below to ensure that any alerts have been addressed and that CheckPoint is properly functioning.

7.1 Daily Status Checks. Group Administrators are required to save reports or numeric charts of temperature information including information relevant to their groups. It should be mentioned that global users can see all CheckPoint devices. The "Notes" field on the far right is typically used to capture information that is salient to the probe. This includes the date the probe was calibrated, calibration expiration date, and MESA Wireless Transmitter box number.

7.1.1 A minimum of two CheckPoint Group Administrators one from Biology and one from Chemistry should create daily reports. Daily reports can be generated by selecting *Reports* → *Daily Review Report* → *New Current Reading Report*. All boxes are pre-checked. If a reading is out of range or if a notation must be made, uncheck the box and enter a comment. Click *save* and enter login ID and password.

7.1.2 After a report is created, it must also be approved in order to save and be available for future reference. From the main menu, select *Reports* → *Daily Review Report* → *Approve Current Reading Reports*. Double click the generated report just created and select *Approve*. Enter login ID and password. Daily reports are available to view in CheckPoint for one year after the date of creation.

7.1.3 Each Section should also save daily reports to the network. (i.e. Biology saves in Lab5 > Biology > BioCommon > CheckPoint reports). This is done in CheckPoint by selecting the 'Reports' tab > Daily Review Report > Approve Current Reading Report. Then, double click the appropriate report, selecting Print, and save it to the appropriate network folder.

7.2 Alarm Checks. Each Group Administrator should conduct high and low alarm checks on sensors within their equipment groups as necessary. Test the sensors by either changing the alarm threshold minimum and maximum values (**Figures 13 and 14**) or by simulating values using an external reference, such as a temperature reference or ice bath. When testing alarms, it is acceptable to change the Alert Threshold to a value that is less than the usual set point value to expedite Alarm testing. If the Alert Threshold is modified, record the change on the Test Log Sheet (see **Figure 15** on page 14 for an example of an Alarm Test Log Sheet). Once testing is complete, reprogram the Alert Threshold to the original setting.

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7.3 Wireless Signal Integrity - Verify the wireless connectivity of the sensor meets Tempsys requirements for link quality and signal integrity by utilizing the CheckPoint Log Analyzer to analyze the G2Log.txt file in the \Windows\Temp directory on the CheckPoint application server. This function is performed by MesaLabs technical support in the event of connectivity issue.

8.0 ANNUAL PROBE RECALIBRATION

8.1 Recalibrate probes annually to a NIST-traceable standard using the lab's Fluke Calibration Bath prior to the probe expiration date (refer to SOP LB-035, Calibration of the Lab Thermometers using a Constant Temperature Calibration Bath). In some cases (e.g., -80 freezers), probes must be exchanged with the new probes that have NIST Certificate of Calibration. Expiration dates are incorporated into the equipment's probe number under *Settings*→*Equipment* (**Figure 12)**.

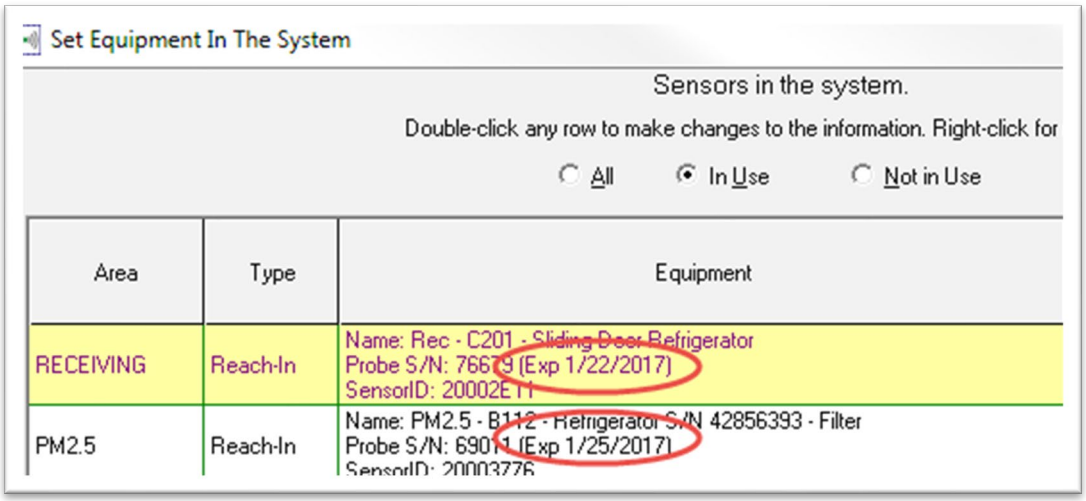


Figure 12 - Probe Expiration Dates

Set a Reminder (optional) that the unit is in calibration within the Tempsys software. Select *Schedule*→*Task Reminders* from the menu, right-click the window and select *Add Task.* Select the equipment of interest and complete the Reminder Details. In the Message text box, include a comment that explains the reminder, i.e., "Temperature probe calibration check is due on 01/29/2017." Click OK to save.

8.2. Open the full Checkpoint software (not the Thin Client version) to adjust temperature range. In *Settings,* select *Equipment.* Locate the sensor/probe to calibrate in the equipment list, and left-click to highlight. Right-click on the highlighted equipment, select *Edit Equipment.* Then select *Temperature* (**Figure 13**) and adjust minimum and maximum temperatures to exceed the range of calibration (**Figure 14**). These settings must be set back to the appropriate temperature range after calibration. Document temperature range adjustment in notes section of the current calibration logbook, form THERM-CALIB-1.4.

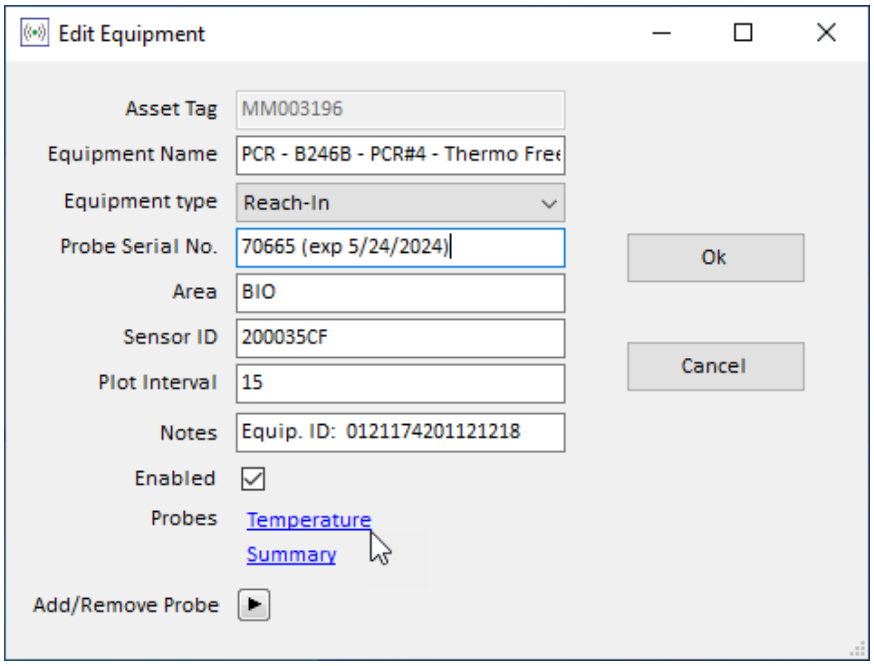


Figure 13 – Edit Equipment

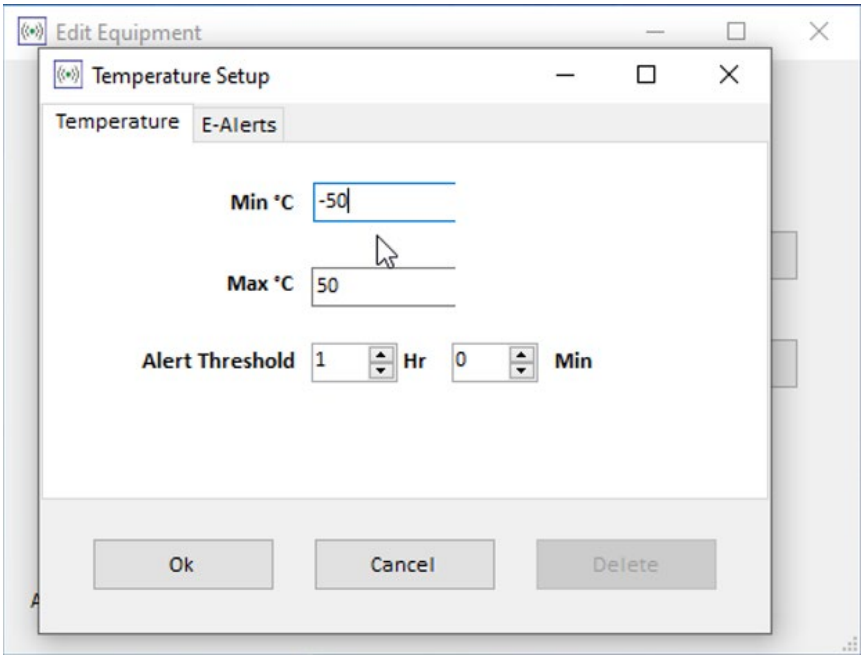


Figure 14-Set Temperature Thresholds

9. TROUBLESHOOTING SENSOR CONNECTIONS

9.1 No sensor Contact Alert

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9.1.1 To check the status of the sensor, press the button once. The button location is not apparent. It is under the surface of the sensor. See **Figure 14** for location of the sensor button. The light should turn on, remain solid for a few seconds, then turn off. This indicates the sensor is connected to the access point (AP). If the light flashes twice, then it is not connected to the AP.



Figure 15 - Sensor Button

9.1.2 To reset the sensor connection, press and hold the button for about 3 seconds until the light starts to flash. Once it has located the AP, the light will flash faster, turn solid, then turn off. Press the sensor button once to ensure it is connected.

9.1.3 If the sensor has not connected, replace the batteries, and follow steps starting at 9.1.1. Look for signs of corrosion on terminals and replace sensor if necessary.

9.1.4 Check repeater and access point status. In CheckPoint menu bar, click *Status*, then Wireless network. A window with all access points and repeaters will appear. (**Figure 15**) Locate the access point (**Figure 16**) or repeater (**Figure 17**) that is offline for visual inspection.

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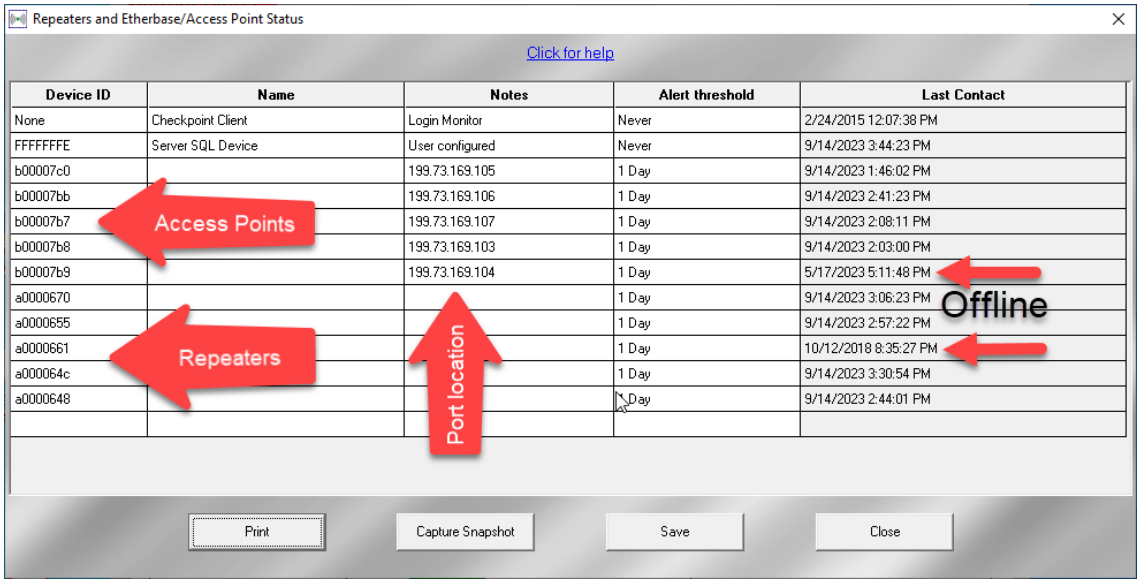


Figure 16- Repeater and Access Point Status



Figure 17- Access point hardware



Figure 18- Repeater hardware

9.1.5 Access points are attached to a ceiling on An AP that is connected to the network should have 2 solid green lights. If it is offline, unplug for 60 seconds, then turn off. If the light flashes twice, it is not connected to the AP. Unplug the power supply for 60 seconds, then plug in.

9.1.6 Test repeater connection by pressing the button once. The light should turn on and remain solid for a few seconds, then turn off. If the light flashes twice, it is not connected to the AP. Unplug the power supply for 60 seconds, then plug in.

9.1.7 Sensors store temperature data even when not connected to an AP. Once a sensor reconnects to the access point, it will backlog all temperature data.

9.1.8 Long power or server outages may cause up to a 2-hour delay for sensors to restore communication. If a sensor has been unable to communicate for more than 2 hours, it will stay dormant and attempt to reconnect only once every 2 hours to conserve the battery. If the repeater or access point remains offline, contact Mesa Labs technical support at 303-987-8000.

9.2 No Probe Alert

9.2.1. The chart will display a series of black dots on the bottom of the chart, indicating the probe is not attached to the sensor. Verify the probe is properly connected with the probe connector. Verify that the wires are not damaged.

9.2.2. If the connections appear to be intact, remove the connector wire and connect the probe directly to the sensor. Double click the sensor button to generate a reading. Allow time for software to refresh. If a reading is generated, the connector likely needs to be replaced. Wait for several auto generated readings to ensure a connection is established.

9.2.3. If the probe does not generate a reading when connected directly to the sensor, the probe wire may be damaged. Replace with another probe to test, and recalibrate. Replace batteries if necessary.

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Date: _____

Figure 19 - Checkpoint Alarm Test Log Sheet

Notify appropriate staff by email before testing any alarms.

Sensor Name:	Sensor Type & ID No. :
Appliance Manufacturer/ Model #:	Sensor Probe ID.:
Asset Tag ID#:	Sensor Bldg / Rm #:
Reference Thermometer ID:	Calibration Expiration:

Change minimum and maximum temperature to verify alarm system is working.

Minimum temperature: _____ (C) Test minimum temperature: _____ (C)
Maximum temperature: _____(C) Test maximum temperature: _____ (C)
Alert threshold: _____ (hours/minutes) Test alert threshold: _____ (hours/minutes)

Test No	Test Result		Alarm Type		Test Methodology			**Signal Integrity** Link Quality (% LQ)	Notes & Comments
	Pass	Fail	Low Alarm	High Alarm	Change Min	Change Max			

Low temperature reset to correct minimum? _____ *(initial)* _____ *(date)*

High temperature reset to correct maximum? _____ *(initial)* _____ *(date)*

Alert threshold reset to original time? _____ *(initial)* _____ *(date)*

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Table 3 - Recommended Annual System Validation & User Training

#	Description	Notes & Comments
1	Probe Calibrations with a new NIST Certificate of Calibration	Snap Calibration Exchange
2	Replace all sensor batteries at time of yearly calibration or as necessary	Minimum voltage 2.9 V
3	System repairs and preventive maintenance	As needed and where applicable.
4	Update CheckPoint application software on the server and user rich client software, as applicable	Upon approval of update (minor change) or upgrade (major change)
5	System Verification and Validation as set forth in sections 4.1 and 4.2, respectively 4.1 System Status of Health (SOH) Verification 4.1 Alarm Checks & End-to-End System Validation	Procedures and acceptance criteria as approved by customer's QA.
6	User Training (a) Basic User (b) Administrator (c) Basic Installation, Troubleshooting & Preventive Maintenance Training	All attendees must sign Attendance Sheet.
07	SQL Database Backup – IT to verify daily backups of SQL database are successfully completed.	Full backups can also be scheduled within CheckPoint from the Server menu: Schedule → Backup.

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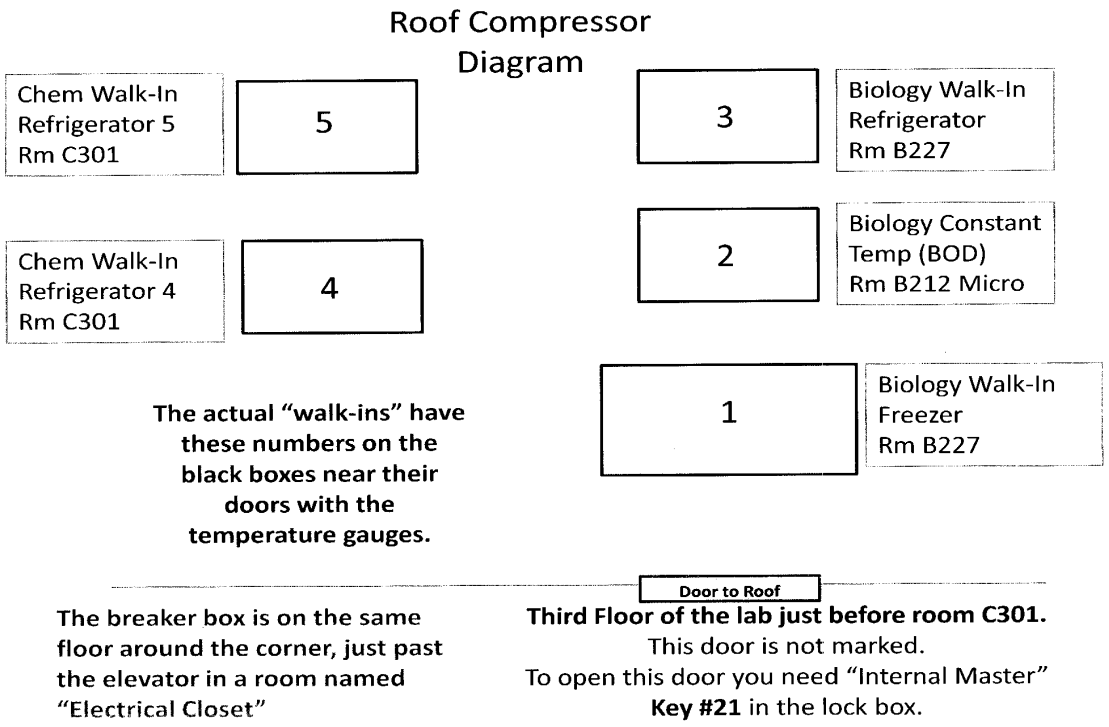


Figure 20 - Roof Compressor Diagram

10.0 NOTES

CheckPoint is compliant with the FDA 21 CFR Part 11 Electronic Records regulation, and meets or exceeds requirements to comply with the following regulatory agencies: Joint Commission, FDA, CAP, AABB, CLIA, USP 797, and State Board of Pharmacy.

Tempsys is accredited by the American Association for Laboratory Accreditation and is an ISO/IEC 17025:2005 & ANSI/NCSL Z540-1-1994ISO/IEC 17025 accredited calibration laboratory. All sensors include a NIST Certificate of Calibration and optional A2LA certification. Tempsys is the manufacturer of the CheckPoint wireless temperature monitoring system and installs, validates, and supports the CheckPoint system.

In Case of Freezer or Refrigerator Breakdown, contact:

Brown's Commercial Refrigeration
4020 Woodville Hwy #D
Tallahassee, FL 32305

24-Hour Service: **(850) 877-2226**

Appendix of Changes

06/21/2023 Made typographical corrections and incremented the version number.

06/03/2024 Moved calibration procedures in section 8 to SOP LB-35. Added new procedure for changing temperature range for probe calibration in section 8.2.2. Added procedure for approving daily reports. Removed any references to procedures for creating cloned records. Added a troubleshooting section.

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