CITY SECRETARY
CONTRACT NO. 50054-C01

MOTOROLA SOLUTIONS

CHANGE ORDER
[C/O # 01]

Change Order No. 01

Date: August 16, 2018

Project Name: Fort Worth, Texas OWS / GPS

Customer Name: Fort Worth, Texas

Customer Project Mgr: Alan Girton

The purpose of this Change Order: Removal of Mixed I/O Module, OptiWarn National Weather Service Option and 337 Flashkits

This Change Order documents

- Removal of the Mixed I/O module from 152 ACE1000 units
- Removal of the OptiWarn National Weather Service option
- Removal of 337 Flash Kits
- Removal of 50 GPS Antennas for APX portables
- Modification of the GPS / Enhanced Data Acceptance Test Plan
- Modification of the Outdoor Warning System Acceptance Test Plan

Contract # 50054 **Contract Date:** December 18, 2017

In accordance with the terms and conditions of the contract identified above between the City of Fort Worth, Texas and Motorola Solutions, Inc., the following changes are approved:

Contract Price Adjustments

This Change Order (#01)	$ (0.00)
Original Contract Value:	$ 1,602,101.00
Previous Change Order amounts for Change Order numbers 00 through 00 :	$ 0.00
New Contract Value:	$ 1,602,101.00

Completion Date Adjustments

Original Completion Date:	September 2018
Current Completion Date prior to this Change Order:	September 2018
New Completion Date:	September 2018

RECEIVED
AUG 27 2018
CITY OF FORT WORTH
CITY SECRETARY

OFFICIAL RECORD
CITY SECRETARY
FT. WORTH, TX

MOTOROLA SOLUTIONS

CHANGE ORDER
[C/O # 01]

Changes in Equipment: *(additions, deletions or modifications)* Include attachments if needed

Remove quantity (152) one hundred and fifty two - VA00599 – Mixed I/O module.
Remove OptiWarn National Weather Service option
Remove of 337 Flash Kits
Remove 50 GPS capable antennas for APX portables

Changes in Services: *(additions, deletions or modifications)* Include attachments if needed

- Acceptance Test Plans modified for the GPS and Sirens. Updated ATP's are attached.

Schedule Changes: *(describe change or N/A)*

N/A

Pricing Changes: *(describe change or N/A)*

This Change Order creates a credit to the City of Fort Worth in the amount of $120,267.51.

Customer Responsibilities: *(describe change or N/A)*

Review requested changes in this document, approve, sign and return to Motorola for contract execution.

Payment Schedule for this Change Order:
(describe new payment terms applicable to this change order)

All added cost and/or credits associated with these change orders will be applied to the 'Final Acceptance' Billing Milestone. Billing Milestone Schedule is included in Section 6 Payment Schedule of the Contract Proposal.

Unless amended above, all other terms and conditions of the Contract shall remain in full force. If there are any inconsistencies between the provisions of this Change Order and the provisions of the Contract, the provisions of this Change Order will prevail.

IN WITNESS WHEREOF the parties have executed this Change Order as of the last date signed below.

Motorola Solutions, Inc.

By: _____
Printed Name: MARK JOHNSON
Title: Regional Services Manager
Date: 8/16/18

Fort Worth, Texas

By: _____
Printed Name: Susan Alanis
Title: Assistant City Manager
Date: 8/24/15

Reviewed by: _____ Date: _____
Motorola Solutions, Inc. Project Manager

APPROVED AS TO FORM AND LEGALITY:

_____
CITY ATTORNEY John B. Strong

Motorola Solutions, Inc. CSC 50054, Change Order No. 1

Contract Compliance Manager:
By signing I acknowledge that I am the person responsible for the monitoring and administration of this contract, including ensuring all performance and reporting requirements.

8/21/18

Steve Streiffert

Assistant Director, IT Solutions Department

Attested by:

Mary J. Kayser, City Secretary

M&C: N/A

1295: N/A

3.2 ENHANCED DATA

3.2.1 Enhanced Data Context Activation

1. DESCRIPTION

Context Activation refers to the process a Radio uses to register for packet data service on the trunked system. For this test, the Radio is configured to initiate a context request with the system upon power-on.

SETUP

RADIO-1 - TALKGROUP 1 (Must be equipped with a display and initially Powered-off)

Note: RADIO-1 must have data capabilities enabled in the network manager.

VERSION #1.050

2. TEST

Step 1. Power-on RADIO-1.

Step 2. After a period of 10 seconds, observe that the radio is enabled for data services by the presence of a data icon on the radio display.

Step 3. Using the menu buttons below the radio display, observe that the radio has a valid IP address

Pass____ Fail____

3.2.2 Preemption of Unprotected Data Channels for Voice

1. DESCRIPTION

Unprotected data channels can be preempted by radios requesting voice services. System Administrators can select the type of channel that is preempted first – P25 data or Enhanced Data.

SETUP

Protected P25 data channels – 0
Protected Enhanced Data Channels -0
Preferred data service – Enhanced Data
RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 2
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - Any Site
Note: Two channels in this test will be allocated for data services – Enhanced Data and P25 data

VERSION #1.060

2. TEST

Step 1. Disable all channels at SITE 1 with the exception of the control channel, and 3 working channels.

Step 2. Using an Enhanced data capable radio, send continuous data messages at a cadence of 30 seconds. Observe that an enhanced data channel is allocated in ZoneWatch.

Step 3. Using a P25 data capable radio, send continuous data messages at a cadence of 30 seconds. Observe that a P25 data channel is allocated in ZoneWatch.

Step 4. Initiate a Talkgroup Call with RADIO-1. Keep this call in progress until instructed to end the call

Step 5. Observe in ZoneWatch that all channels are allocated.

Step 6. Key RADIO-2 on TALKGROUP 2 and observe that the radio can make a call to RADIO-3. Observe in ZoneWatch that the Enhanced Data channel is allocated, but the P25 data channel has been converted to a voice call.

Step 7. End the Talkgroup Call established in Step 4. End the call between RADIO-2 and RADIO-3.

Step 8. In the network manager, change the preferred data service from Enhanced Data to P25 data. Allow time for the parameter to be distributed to the target devices.

Step 9. Repeat Steps 1-8 to observe that the data channel that is preempted and converted to voice is the Enhanced Data channel.

Step 10. Return all the channels in the system to service.

Pass____ Fail____

3.2.3 Protected P25 Data Channels

1. DESCRIPTION

Protected P25 data channels cannot be preempted by radios requesting voice services. If no voice channel resources are available and data channels are allocated at or below the protected data channel limit, radios requesting channels for new conversations are placed in a queue. Users of the same priority will move through the queue in a FIFO (first in, first out) sequence.
When a voice channel becomes available, the radio at the top of the busy queue gets a channel assignment and generates a callback tone. The callback tone alerts the user that a channel assignment was made and transmitting is now possible on the selected talkgroup.

SETUP

Protected P25 data channels – 1
RADIO-1 - TALKGROUP 1
RADIO-1 - SITE - SITE 1
RADIO-2 - TALKGROUP 2
RADIO-2 - SITE - SITE 1
RADIO-3 - TALKGROUP 2
RADIO-3 - SITE - Any Site

VERSION #1.070

2. TEST

Step 1. Simulate a busy system by disabling all channels at SITE 1 with the exception of the control channel, 1 P25 data channel and one voice channel.

Step 2. Using a P25 data capable radio, send continuous data messages at a cadence of 30 seconds. Observe that a P25 data channel is allocated in ZoneWatch.

Step 3. Initiate a Talkgroup Call with RADIO-1. Keep this call in progress until instructed to end the call.

Step 4. Observe in ZoneWatch that all channels are allocated.

Step 5. Key RADIO-2 on TALKGROUP 2 and observe that the radio receives a busy. Observe in ZoneWatch that the data channels are allocated and RADIO-2 is in the busy queue.

Step 6. End the Talkgroup Call established in Step 4.

Step 7. Observe RADIO-2 receives the callback tone and can now make a call to RADIO-3 upon receipt of the callback indication.

Step 8. End the call between RADIO-2 and RADIO-3.

Step 9. Return all the channels in the system to service.

Pass____ Fail____

3.3 LOCATION SERVICE

3.3.1 Location Information Received

1. DESCRIPTION

The Location system will receive information on the provisioned subscribers in order to appropriately map the units on a mapping service.

Note: Location requires reception of a clear GPS signal which may not always be possible inside of a building or covering.

SETUP

Location services installed and configured for 30 second updates

RADIO-1 - GPS-enabled and provisioned with Location Service

VERSION #1.020

2. TEST

Step 1. From the device list on the location client expand the device details for RADIO-1.

Step 2. Verify that the Latitude, Longitude and update time are shown for RADIO-1.

Step 3. Move the RADIO-1 location enough to cause the RADIO to report a new GPS location. Verify that the new location information is received. (will take a few seconds depending on the polling frequency, should be configured for 30 seconds in this case.)

Pass____ Fail____

SIGNOFF CERTIFICATE

By their signatures below, the following witnesses certify they have observed the system Acceptance Test Procedures.

Signatures

WITNESS: _____ Date: _____

Please Print Name: _____ _____

Initials:

Please Print Title: _____

WITNESS: _____ Date: _____

Please Print Name: _____ _____

Initials:

Please Print Title: _____

WITNESS: _____ Date: _____

Please Print Name: _____ _____

Initials:

Please Print Title: _____

OPTIWARN

OPTIMIZED SIREN WARNING SOLUTION

ACCEPTANCE TEST PLAN DOCUMENT - FIELD TEST

Version Date 8/8/2018
Version 1.2

Prepared By:
Marc A. Brauer

MOTOROLA SOLUTIONS

TABLE OF CONTENTS

1. SCOPE OF DOCUMENT

Motorola Solutions Inc. (MSI) will conduct an Acceptance Test Plan (ATP) of the system and siren RTUs purchased by our customer. This ATP will serve as a test criteria to demonstrate the complete and working operation of each Control Center, 15 siren RTUs (Remote Terminal Unit), and special RTU (if applicable) in the system as agreed upon, installed, and delivered. The system will be deemed operational as agreed upon in the SOW (Statement of Work) upon successful execution of the ATP. The system will then be conditionally accepted by the customer.

2. METHODOLOGY OF TESTS

Fifteen (15) siren sites will be checked for proper individual operation from each activation point in the system. This consists of activating all emergency sequences for fifteen (15) sirens. The test will simulate as closely as possible actual operation conditions. In addition to activation, the fifteen (15) sirens and each special RTU (if applicable) will be tested for correct Status feedback. The specific test points will be defined later in this document. Report printouts of field status may be appended to the end of this document to show correct operations.

It is suggested that the testing procedure use the two-team approach where one team, consisting of one Motorola representative and one customer representative, operate one of the control centers, while the other team, consisting of one Motorola representative and one customer representative, travel to each RTU site to confirm that the system operates correctly.

In the event that any siren or special RTU (if applicable) fail its initial tests, that particular siren will be re-tested when Motorola determines that corrective action has been taken to enable proper operation. If any correction was made to the siren or special RTU (if applicable) hardware, and upon discretion of both parties, the entire site may be re-tested to insure that the correction did not have any negative effect.

3. ATP COMPLETION AND SYSTEM ACCEPTANCE

When all activation points and fifteen (15) RTUs have passed their tests, the System Acceptance Test Plan will be considered successfully completed. Final acceptance will occur after the successful completion of the Final System Acceptance Test. This test will consist of two parts:

1. A system wide growl test initiated from each Control Center
2. A system wide full volume activation from the Primary Control Center
    - Any failed ATP procedure that is the responsibility of Motorola will be corrected by Motorola.
    - Any failed ATP procedure that is due to malfunction of non-Motorola supplied system equipment will not necessarily fail the ATP.

4. OPTIWARN CONTROL CENTERS

Each of the Control Centers will be used to activate each of the command sequences.. The command sequences and their respective commands are formally defined in Section 8.

All Control Centers will log and display activation information from all other Control Centers in the system. This information will be shown on the activation screens of the Control Center, the local alarm/event printer (if applicable), and also be logged to each Control Center's hard disk log. This information will allow the operators to know what the system is doing at all times as well as keep a log of the events in case a review needs to be made of events taking place in the system. The test for the Control Centers is two fold:

1. Control Center Activation Control and Logging
    a) Local Control Center Activation
    b) Remote Control Center Activation Logging
2. Control Center Status Logging
    a) Siren and Special RTU (if applicable) Status

b) Status of other Control Center(s) (if applicable)

5. OPTIWARN GRAPHICAL USER INTERFACE (GUI)

The OPTIWARN GUI is broken down into four (4) sections as described below.

MENU

The Menu is shown on the very top of the screen and it's primary purpose is screen navigation but also shows the current time & date. In addition, the Current Interrogation indication is displayed on the Menu. When logged in with System Manager access, an operator can minimize the OPTIWARN GUI to view the desktop or exit/close the OPTIWARN GUI.

RIBBON

The Ribbon section is shown just below the Menu and there are several different ribbons depending on screen navigation. Each ribbon includes a combination of commands, additional screen navigation and an alarm summary which would be either system wide or communication fail specific for the Interrogate Ribbon.

MAIN SCREEN

The Main Screen area contains all the screens to be discussed throughout this document including the Map Screen, Alarm Summary, Site Status Screen, Siren Command Logger, etc.

STATUS BAR

The Status Bar appears at the very bottom of the screen and shows the current operator, associated access level, computer name, general FEP status, activation report status, alarm logger status, WIN-911 status, and automated activation status. The Status Bar also displays the name of the Control Center that initiated the current command sequence as well as the name of the current command sequence.

6. OPTIWARN ACCEPTANCE TEST PLAN

The following tests represent the OptiWarn ATP.

Graphical User Interface - Map Screen (Siren Site Status)

1. DESCRIPTION

Upon successful log-in, the user is taken directly to the Map screen where overall system status can be viewed and siren activations can be initiated. An icon is shown for each siren site and is color-coded for current general status of the corresponding site located in the specific location of the site based on GPS coordinates on the system map. Right-clicking on any of the siren site icons will open the Single Site Status pop-up window to view specific status information for the selected siren.

This test verifies that the **OPTIWARN SIREN SYSTEM** Map Screen functions properly.

2. SETUP

Navigate to the Map screen by clicking on the Map button from the Navigation Ribbon. If the Map button is not visible, click COMMAND from the Menu and the Map screen should open automatically.

3. TEST

Step 1 Verify general alarm status indications for each site are shown correctly – solid green for no alarms, solid red for acknowledged alarms, blinking red/yellow for unacknowledged alarms, blinking green/yellow for sites with alarms that have returned to normal prior to being acknowledged.

Step 2 Placing the mouse over any of the siren site icons should show a "tooltip" with the site location. Verify proper site location information is displayed for each site.

Step 3 Verify that right-clicking on any of the Siren Site icons opens the Single Site Status pop-up window.

Step 4 Make note of the Mouse Pointer Lat/Long shown above the map. Verify the proper settings by moving the mouse point to the center of one of the Siren Site icons and right-clicking being careful not to allow the mouse to move. Compare the Mouse Pointer Lat/Long with the Map Coordinates for the site displayed on the Single Site Status screen. The numbers should be accurate within 0.001 or so on both Lat/Long.

Step 5 The general Siren Site icon size is operator adjustable within the ZOOM section on the Map screen. The operator can click on the number within the circle to enter a size percentage (20-100) or by dragging the circle left or right to decrease or increase the icon size. Please note if a site is selected for activation, currently activating, has an alarm or unacknowledged alarm, the Siren Site icon is automatically displayed as full-size.

Pass____ Fail____

Graphical User Interface - Map Screen (Map Screen Zoom)

1. DESCRIPTION

The **OPTIWARN SIREN SYSTEM** provides the operator with the ability to zoom into the Map by dividing the overall map into 9 "zoomed in" maps. The operator can choose which zoomed in section to view by moving the mouse over the mini-map in the ZOOM section of the Map screen and then left-clicking to view the zoomed in area.

2. SETUP

Navigate to the Map screen by clicking COMMAND from the Menu and then clicking the View Activation Map Screen button if necessary.

3. TEST

Step 1 With the map zoomed out to the entire system area, verify the siren site icons appear in the proper location.

Step 2 Maneuver the mouse pointer over the mini-map in the ZOOM section of the Map screen and note how the different sections are available with a yellow highlight.

Step 3 Click the section to zoom in. Verify the yellow mouse over highlight turns blue, a new map is displayed in the main section of the Map screen and only the siren site icons residing in that area are displayed.

Step 4 In the SITES section, click the Displayed toggle to filter the Site List from all sites to those now displayed on the zoomed in map.

Step 5 In the Site List, left click on one of the sites listed and note the associated siren site icon appears at full size with a blue circle to highlight its location on the map.

Step 6 Make note of the Mouse Pointer Lat/Long shown above the map. Verify the proper settings by moving the mouse point to the center of one of the Siren Site icons and right-clicking being careful not to allow the mouse to move. Compare the Mouse Pointer Lat/Long with the Map Coordinates for the site displayed on the Single Site Status screen. The numbers should be accurate within 0.001 or so on both Lat/Long.

Pass____ Fail____

Graphical User Interface - Map Screen (Zone/Siren Selection)

1. DESCRIPTION

All OptiWarn activation tests shall be conducted from the Siren System Primary Control Center unless otherwise specified. The alarms demonstrated are to be made with test equipment where it is practical to create an actual alarm or when not practical the alarm will be initiated through the use of the ACE STS programming software. The following will provide a brief introduction and description of the main display screens encountered when navigating the **OPTIWARN SIREN SYSTEM** GUI (Graphic User Interface).

Upon initial boot-up, the Control Center will automatically log-in in standard Operator mode which allows the operator to view and acknowledge alarms, activate the sirens, and interrogate the sites. View Only mode allows the operator to view system status and monitor the system only; NO siren control and NO site interrogation will be allowed in this mode. If the system does not have an operator logged in, the user can click the Log On button from the button ribbon which will then prompt the user to enter his/her Username and Password or Access Code if the InTouch User Manager is disabled.

2. SETUP

The only setup is for this test is to have the computer turned on. All necessary software and applications should start automatically.

3. TEST

Step 1 Verify the following ancillary functions are available on the Primary Control Center by successfully logging into the SIREN SYSTEM alerting application with Operator level access (Username = OP, Password = op; not case sensitive).

Step 2 Navigate to the Map screen by clicking the Command menu item on the ribbon Bar.

Step 3 Select all sites/zones by clicking on the ALL SITES button. Verify all zone buttons including ALL SITES and all siren site icons appear with yellow highlight.

Step 4 Deselect all zones by clicking on the CLEAR button located near the bottom of the Siren Command Screen. Verify all zone buttons and siren site icons lose yellow highlight.

Step 5 Select individual zones by clicking on the individual zone buttons (e.g. Northwest, Northeast, Southwest, and Southeast). Verify proper zone selection appears with yellow highlight and verify proper sirens are shown selected with yellow highlight.

Step 6 Press CLEAR button to reset all selections. Verify all zone buttons and siren site icons lose yellow highlight.

Step 7 Select individual siren sites by left-clicking on the individual siren site icons. Verify each selected siren appears with a yellow highlight.

Step 8 Deselect previously selected siren sites by left-clicking on the siren site icon and verify the siren loses yellow highlight.

Pass____ Fail____

Graphical User Interface - Site List

1. DESCRIPTION

This test verifies that the **OPTIWARN SIREN SYSTEM** Site List screen functions properly.

2. SETUP

Navigate to the Site List screen by clicking SITE LIST on the ribbon bar.

If navigating from one of the Siren Status Screens, one of the Maintenance Command screens or the System Manager Screen, the Site List should auto-scroll to the first site displayed on the visible Siren Status Screen.

3. TEST

Step 1 Verify the Site List pop-up window appears.

Step 2 Verify proper site name, and street address along with siren type is displayed for each site.

Step 3 Scroll up and down through the list and verify information is properly displayed.

Step 4 Press the Go To Site button and enter a number from 1-191 and verify site is placed at the top of the site list unless site number is too high where the last site in the list would exceed the max of 191 in which case, the selected site should still be displayed but not at the top of the list.

Step 5 Verify proper site name for each Control Center/FEP/CEN Unit locations.

Pass____ Fail____

VERSION #1.000

Alarm Processing - Acknowledged Alarm

1. DESCRIPTION

This segment of the test verifies that the bi-state siren site alarms are processed and communicated to the **OPTIWARN SIREN SYSTEM** Primary Control Center. The alarms will be generated from a combination of simulated alarms associated with the test siren setup or via software.
The Alarm indicators on the Siren Status Screen and Single Site Status Screen shall have the following characteristics:

Alarms

- If it is normal than the indicator is dark green
- If an alarm is active and is not acknowledged then the indicator is blinking in red/yellow colors
- If an alarm is active and acknowledged than indicator is solid red
- If an alarm returns to normal but is not acknowledged, then the indicator is blinking in yellow/dark green colors
- If an alarm returns to normal and is acknowledged than the indicator is dark green
- If a specific alarm is not applicable for a site, the indicator will be gray

Status

- For event status the color scheme is dark green for "standby" state.
- Bright green for "active state"
- If a specific status is not applicable for a site, the indicator will be gray

2. SETUP

Navigate to the Siren Status screen by clicking the Status button and then clicking the Sirens button on the Status Selection pop-up screen.

3. TEST

Step 1 The Siren Communication status should show ALARM on all RS232-based sirens since the associated ACE RTU is not connected to a live Siren during staging. This status will be disabled and represented by a gray alarm icon for any mechanical sirens.

Step 2 Create an alarm condition on a mechanical siren site by toggling the associated digital input (DI#3 - Intrusion).

Step 3 Verify that the colored status for the associated alarm on each Control Center is blinking red and yellow and that the "state" text is red and is displayed for the correct alarm point and site.

Step 4 Click the associated site "acknowledge" button on any of the Control Centers and verify the alarm status becomes solid red on each Control Center.

Step 5 Navigate to the Alarm Summary screen by clicking ALARM SUM on the ribbon bar and confirm the screen is in Historical mode. Then verify that the alarm displays in red text on the Alarm Summary window followed by black text with the timestamp associated with both events.

Step 6 Toggle the mode to Summary and verify the alarm indication appears in black text.

Step 7 Return the alarm point to the normal condition. Verify that the colored alarm icon for the associated alarm returns to normal on each Control Center.

Step 8 Verify that the alarm text has an additional entry in green on the Alarm Summary.

Step 9 Toggle the mode to Summary and verify the alarm indication is no longer present in the list.

Pass____ Fail____

Alarm Processing - Unacknowledged Alarm

1. DESCRIPTION

This segment of the test verifies that the bi-state siren site alarms are processed and communicated to each of the OptiWarn Control Centers. The alarms will be generated from a combination of simulated alarms associated with the *test siren setup* or via software.
The Alarm indicators on the Siren Status Screen or Single Site Status Screen shall have the following characteristics:

Alarms

- If it is normal than the indicator is dark green
- If an alarm is active and is not acknowledged then the indicator is blinking in red/yellow colors
- If an alarm is active and acknowledged than indicator is solid red
- If an alarm returns to normal but is not acknowledged, then the indicator is blinking in yellow/dark green colors
- If an alarm returns to normal and is acknowledged than the indicator is dark green
- If a specific alarm is not applicable for a site, the indicator will be gray

Status

- For event status the color scheme is dark green for "standby" state.
- Bright green for "active state"
- If a specific status is not applicable for a site, the indicator will be gray

2. SETUP

No additional setup is necessary.

3. TEST

Step 1 Create an alarm condition on a mechanical siren site by toggling the associated digital input (DI#3 - Intrusion).

Step 2 Verify that the colored alarm icon for the associated alarm on each of the Control Centers is blinking red and yellow and that the "state" text is red and is displayed for the correct alarm point and site.

Step 3 Navigate to the Alarm Summary screen and verify that the alarm displays in red text on the Alarm Summary window.

Step 4 Toggle the mode to Summary and verify the alarm indication displays in red text.

Step 5 Return the alarm point to the normal condition. Verify that the colored alarm icon for the associated alarm returns to normal but remains blinking green and yellow on each Control Center.

Step 6 Navigate to the Alarm Summary screen and verify that the alarm displays in green text on the Alarm Summary window.

Step 7 Toggle the mode to Summary and verify the alarm indication displays in green text.

Step 8 Click the associated site "acknowledge" button on either computer and verify the alarm icon becomes solid green.

Step 9 Navigate to the Alarm Summary screen and verify that the alarm displays in black text on the Alarm Summary window.

Step 10 Toggle the mode to Summary and verify the alarm indication is no longer in the list.

Pass____ Fail____

Graphical User Interface - FEP/CEN Status Screen

1. DESCRIPTION

This segment of the test verifies that the bi-state FEP site alarms are processed and communicated to the **OPTIWARN SIREN SYSTEM** Primary Activation Computer. The alarms will be generated from real alarms associated with the FEP sites.

The alarm point indicators are preconfigured for the SIREN SYSTEM. There are up to three (3) alarm points per FEP. The Alarm indicators on the FEP Status Screen have the following characteristics:

Alarms

- If it is normal than the indicator is dark green
- If an alarm is active and is not acknowledged then the indicator is blinking in red/yellow colors
- If an alarm is active and acknowledged than indicator is solid red
- If an alarm returns to normal but is not acknowledged, then the indicator is blinking in yellow/dark green colors
- If an alarm returns to normal and is acknowledged than the indicator is dark green

2. SETUP

A charged ACE battery must be present in order to pass this test. After the PWR IN cable has been removed it will take around 60 seconds for the Alarm to reach the Control Centers. The reason this alarm takes so long is that there is an embedded delay timer within the application to rule out a site only losing power for a few seconds.

3. TEST

Step 1 Select an FEP for the test and remove the PWR IN cable on the Power Supply module or unplug the AC power cord.

* as the siren RTUs are to be powered by the siren batteries, this test is N/A for them

Step 2 Verify that PWR light turns Yellow and the BATT light turns Red on the ACE Power Supply Module.

Step 3 After approximately 60 seconds, verify that an ACE AC Voltage alarm for the appropriate FEP is received on the FEP/CEN Status screen on all Control Centers.

Step 4 Reconnect PWR IN cable to Power Supply module. Verify the PWR light returns to Green and the BATT light starts blinking indicating the battery backup is being charged.

Step 5 After approximately 60 seconds, verify the ACE AC Voltage alarm returns to normal.

Step 6 Disconnect the Ethernet cable to the Backup FEP. Within 25 minutes, an ACE Communication alarm will appear on each Control Center.

Step 7 Reconnect the Ethernet cable to the Backup FEP and interrogate the FEP via Interrogation Ribbon.

Step 8 Verify the ACE Communication alarm returns to normal and the Last Received Time & Date is updated with the current time.

Pass____ Fail____

VERSION #1.000

Computer to ACE FEP Communication Status

1. DESCRIPTION

This test verifies that if the communication connection between the Control Center and the corresponding FEP is disconnected that an alarm will be present on each Control Center.

The connection between the OptiWarn Control Center and its associated FEP is an Ethernet link.

2. SETUP

3. TEST

Step 1 Disconnect the Ethernet link from the computer.

Step 2 An alarm will be created causing the Modbus Failure pop-up screen to appear on the local computer. Should display Current Communication Status alarm with an associated Acknowledge button.

Step 3 Verify the existence of a Computer Communication alarm for the appropriate FEP site on ALL Control Centers.

Step 4 Reconnect the Ethernet link.

Step 5 Verify the Modbus Failure pop-up shows blinking Normal on the local computer. Click the Acknowledge button and the pop-up window should disappear.

Step 6 Check that the Computer Communication alarm returns to normal on ALL Control Centers.

Pass____ Fail____

VERSION #1.000

Graphical User Interface - Alarm Summary Screen

1. DESCRIPTION

The Alarm Summary Screen provides a text display of all alarms currently present in the system. On this screen, the operator can switch Historical and Summary mode by selecting the "Historical" "Summary" toggles. In Historical mode, a chronological list of the most recent 5000 alarms and events is displayed. In Summary mode, only the current alarms are displayed – i.e. items currently in alarm or have not yet been acknowledged.

Additionally, the display can be filtered to show only alarms based on site number, by zone, or by priority.

Alarms and events are all logged with date and time when the alarm or event took place. In addition, the alarms and events are also color-coded – red for alarms, green for return to normal, black for acknowledge and blue for events.

This test verifies that the **OPTIWARN SIREN SYSTEM** Alarm Summary screen functions properly.

2. SETUP

Navigate to the Alarm Summary screen by clicking on the ALARM SUM menu item.

3. TEST

Step 1 Verify the Alarm Summary screen has been logging alarms, events, and acknowledges properly.

Step 2 Verify mode toggling between default Historical and Summary by selecting the appropriate toggle.

Step 3 Verify alarm filtering functionality of only alarms/events associated with the FEPs & PCs by selecting the FEPs & PCs toggle.

Step 4 Verify alarm filtering functionality of only alarms/events associated with all of the siren sites by selecting the Sirens Only toggle.

Step 5 Verify alarm filtering functionality of only alarms/events associated with a specific siren by selecting the Specific Siren toggle and entering the appropriate site number in the associated box.

Step 6 Verify alarm filtering functionality of only alarms/events with a particular priority by clicking the From: XXX button and entering a specific priority (e.g. 4 for Intrusion alarms) and clicking the To: XXX button and entering the same specific priority.

Pass____ Fail____

VERSION #1.000

Graphical User Interface - Alarm Logger Functionality

1. DESCRIPTION

The Alarm Summary Screen provides a third mode - Logger. While in Logger mode, the operator can specify a date/time range in addition to the other alarm filtering functionality from the previous test.

In the OPTIWARN SIREN SYSTEM, all alarms and events are not only displayed on the Alarm Summary screen and logged to a daily alarm/event file, they are also logged to a SQL database. In Logger mode, the operator essentially performs queries on the SQL database to display specific alarm/event information based on the filters selected by the operator.

This test verifies that the **OPTIWARN SIREN SYSTEM** Alarm Summary screen functions properly.

2. SETUP

Navigate to the Alarm Summary screen by clicking on the ALARM SUM menu item.

3. TEST

Step 1 To enter Logger mode, click the Logger toggle. Previous alarm filtering selections should remain while new entries for Start/End Date/Time are visible to the operator.

Step 2 Verify the Start Date/Time displays today's date with a time of 00:00:00 (midnight) and End Date/Time displays today's date and current time.

Step 3 Verify proper alarm/event display based on previously selected alarm filtering.

Step 4 Click the Reset Alarm/Event Logger Filtering button to reset the filters to default including updating the Start/End Date/Time.

Step 5 Change the Start/End Date/Time selections, set the From/To Priorities, and select a Specific Siren. Notice that the alarm logger display does NOT change. Click the Update Alarm/Event Filtering button.

Step 6 Verify the appropriate alarms/events are displayed given the above selections.

Pass____ Fail____

VERSION #1.000

Siren Site Interrogation

1. DESCRIPTION

This test verifies that the user can manually interrogate sites through the Interrogation ribbon in the **OPTIWARN SIREN SYSTEM** application.

The **OPTIWARN SIREN SYSTEM** is configured to automatically interrogate the Siren Sites on a regular basis. Each Control Center/FEP in the system has the ability to interrogate the siren sites independently.

There is a Disable Interrogation Schedule button on the interrogation ribbon available to users logged in with System Manager access level which allows the user to turn off the automatic periodic interrogation cycles. This button is only effective for the FEP connected to the specific Control Center where this option was implemented. Please note that operator-initiated interrogations will still be available as well as siren activation report initiated interrogations.

2. SETUP

Be sure all active sites are communicating properly.

3. TEST

Step 1 Click INTERROGATE on the Menu to display the Interrogation Ribbon.

Step 2 Click the RTU interrogation button which will bring up a keypad that allows the operator to enter the specific RTU number to be interrogated.

Step 3 Note the Current Interrogate indication on the Menu which should match the number entered by the Operator and note the animation on the RTU interrogation button.

Step 4 Click on the ALL SITES button to interrogate all the sirens in the system. Verify Current Site being Interrogated shows incrementing siren site numbers starting at 1 and proceeding to the last site number. Before allowing the interrogation cycle to complete, press the CANCEL button and verify cycle ceases immediately. Verify Current Interrogate returns to Idle.

Part 2 - Single Site Status Screen

Step 5 Click COMMAND on the Menu to display the Command Ribbon and the Map Screen.

Step 6 Right click on one of the Siren Site icons to display the Single Site Status screen. Make note of the Last Received time & date before clicking the Interrogate Site button.

Step 7 Note the Current Interrogate indication on the Menu which should match the site number associated with the Single Site Status screen and note the Interrogate Site button animation.

Step 8 Once the site responds to the interrogation, the Last Received time & date should update.

Pass____ Fail____

Siren Site Communication Failure

1. DESCRIPTION

This test verifies that a loss of communication to each site will be reported to the **OPTIWARN SIREN SYSTEM** application.

2. SETUP

No additional setup is necessary for this test.

3. TEST

Step 1 Click INTERROGATE on the Menu to open the Interrogation Ribbon and decide which Siren site to test.

Step 2 Disconnect the designated Siren site's radio by removing the connection between the ACE CPU and the radio.

Step 3 Perform an interrogation to the selected Siren site by clicking the RTU interrogate button and entering the appropriate site number.

Step 4 Confirm that a Radio Communication alarm appears in the mini-Alarm Summary displayed on the Interrogation Ribbon. The Radio Communication alarm is also displayed on the appropriate Siren Status screen for the associated Siren site.

* Please note that Radio Communication alarms are determined independently on each FEP so this alarm will NOT necessarily appear on all computers unless the other FEP(s) interrogate that site as well.

Step 5 Reconnect the Siren site's radio to the ACE CPU and interrogate the Siren site again. Confirm the Siren site has returned to normal communication status.

VERSION #1.000

Pass____ Fail____

Siren Zone/All Sites Activation Silent/Quiet Test Command from the Primary Control Center

1. DESCRIPTION

All siren activations can happen from the Map screen where the siren site icons are displayed based on GPS coordinates. There are also Maintenance Command screens that list the sirens in numerical order which could be easier for an operator unfamiliar with the layout of the sirens within the system.

Whether the sirens are activated from the Map screen or the Maintenance screens, the sirens activate the same way. One other difference between the Map screen and the Maintenance screens is the Zone Selection buttons are only present on the Map screen so for the purposes of this test, we will activate from the Map screen.

The bottom row of buttons is consistent on each activation screen which includes CLEAR selections, START and STOP.

This test demonstrates the sending of the Silent/Quiet Test command from the OPTIWARN SIREN SYSTEM application to all of the Siren sites.

2. SETUP

Navigate to the Map screen by clicking COMMAND on the Menu.

3. TEST

Step 1 From the Primary Control Center bring up the Map screen.

Step 2 Send a command to all sites/zones by clicking the ALL SITES button (verify yellow indicator on all zone buttons, ALL SITES and each Siren Site icon), clicking Silent/Quiet Test (verify yellow indicator) and START (verify change to blinking WAIT text).

Step 3 On ALL Control Centers, verify all the zone indicators change from solid yellow to light blue. Verify the Silent/Quiet Test indication changes from solid yellow to blinking light blue and yellow. Verify each of the Siren Site icons change from solid yellow to light blue. Bring mouse pointer over one of the active sirens and the command name should be appended to the site location information as part of the Tooltip.

Step 4 Verify the test siren is running an inaudible siren test.

Step 5 On ALL Control Centers, verify the current siren activation information is displayed on the Last Activation Status pop-up window and is properly displayed on the Status Bar for the duration of the activation.

Step 6 Thirty seconds after the activation is complete, the Primary FEP will automatically initiate an interrogation cycle to retrieve the siren activation results from all the sites involved in the activation.

* The user can monitor the Siren Status screen to watch the activation results report

Step 7 On ALL Control Centers, verify the appropriate status for all siren sites is displayed.

Step 8 On ALL Control Centers, verify the siren activation report appears properly.

Pass____ Fail____

Individual Siren Site Activation Command from Primary Control Center

1. DESCRIPTION

All siren activations can happen from the Map screen where the siren site icons are displayed based on GPS coordinates. There are also Maintenance Command screens that list the sirens in numerical order which could be easier for an operator unfamiliar with the layout of the sirens within the system.

Whether the sirens are activated from the Map screen or the Maintenance screens, the sirens activate the same way. One other difference between the Map screen and the Maintenance screens is the Zone Selection buttons are only present on the Map screen so for the purposes of this test, we will activate from the Map screen.

The bottom row of buttons is consistent on each activation screen which includes CLEAR selections, START and STOP.

This test demonstrates the sending of the Silent/Quiet Test command from the OPTIWARN SIREN SYSTEM application to a single siren site.

2. SETUP

Navigate to the Map screen by clicking COMMAND on the Menu.

3. TEST

Step 1 Send a command to a Siren Site by clicking on the associated Siren Site icon (verify yellow indicator), clicking Silent/Quiet Test button (verify yellow indicator) and START (verify change to blinking WAIT text).

Step 2 On ALL Control Centers, verify the Siren Site icon changes from solid yellow to light blue. Verify the Silent/Quiet Test indication changes from solid yellow to blinking light blue and yellow.

Step 3 Verify the simulated siren is operating properly with the appropriate timing.

Step 4 On ALL Control Centers, verify the current siren activation information is displayed on the Last Activation Status pop-up window and is properly displayed on the Status Bar for the duration of the activation.

Step 5 Thirty seconds after the activation is complete, the Primary FEP will automatically initiate an interrogation cycle to retrieve the siren activation results from all the sites (just one for this test) involved in the activation.

* The user can monitor the Single Siren Status screen associated with the specific site to watch the activation results report

Step 6 On ALL Control Centers, verify the appropriate status for the test siren is displayed.

Step 7 On ALL Control Centers, verify the siren activation report appears properly.

Pass____ Fail____

VERSION #1.000

Graphical User Interface – Siren Command Logger

1. DESCRIPTION

This test verifies that the OPTIWARN SIREN SYSTEM Siren Command Logger screen functions properly.

This screen displays the last 250 Siren command sequences performed throughout the system. This log is actually stored and maintained by the FEP associated with the computer.

2. SETUP

Navigate to the Siren Command Logger screen by clicking SYSTEM TOOLS on the Menu and then clicking the Siren Command Logger button.

3. TEST

Step 1 Verify the Siren Command Logger shows each of the siren activation commands performed during this test.

Step 2 Check proper Command Sequence is listed for each, sequence duration appears as expected, number of sirens effected, sequence number (starts 16xx for all commands sent from the Primary Control Center; 32xx for all commands sent from the Secondary Control Center, etc.), and appropriate Start time and date.

Step 3 Scroll up/down the list and make sure the events scroll as expected.

Step 4 Click on any of the non-zero Activation IDs and view the pop-up explorer window. The files filtered in the window should each start with the Activation ID in 5-digit (i.e. 00000) format. There should be two files - one with "full siren info" and one with "list only" in the file name.

Step 5 Double-click the file with "list only" in the file name and Notepad should appear as a pop-up window containing the activation details for the event selected. This information includes the date/time, specific command sequence activated, the sequence ID, activation ID and then a list of site numbers with their siren numbers. This information also includes whether the command was "Operator Initiated", "Remote Activation" (i.e. activated from a different Control Center), or "Automated Scheduler".

Step 6 Double-click the file with "full siren info" in the file name and Notepad should appear as a pop-up window containing the activation details for the event selected. This information includes the same information as the "list only" file, but also includes the siren address information.

Pass____ Fail____

System Manager Screen - Active Yes/No Siren sites

1. DESCRIPTION

This test verifies that Siren sites can be enabled and disabled on the System Manager screen and this state is reflected throughout the system.

2. SETUP

Navigate to the System Manager Screen by clicking on SYSTEM TOOLS on the Menu and clicking on the System Manager button. The System Manager screen is only accessible if the User login and password have administrator rights (Access Level = 9999).

3. TEST

Step 1 Navigate to the System Manager screen.

Step 2 Disable the siren site by clicking the green checkmark icon next to the siren site number to be disabled.

Step 3 Navigate to the Map screen. Verify the associated siren site icon appears in gray.

Step 4 Right-click the siren site icon to display the Single Site Status screen. Verify all the status indications for the associated site are shown in gray.

Step 5 Navigate to the Siren Status screen by clicking the Show Status Screen button. Verify all the status indications for the associated site are shown in gray.

Step 6 Navigate back to the System Manager screen and enable the siren site by clicking on the red X icon next to the siren site number to be enabled.

Step 7 Recheck the Map screen, Single Site Status screen, and Siren Status screen to be sure site has returned to normal status except for a Radio Communication alarm.

Step 8 Navigate to the Single Site Status screen for the site and click the Interrogate Site button. Within a few seconds, the Radio Communication status should return to normal.

Pass____ Fail____

VERSION #1.000

System Manager Screen – Manual Report Generation

1. DESCRIPTION

The **OPTIWARN SIREN SYSTEM** uses Microsoft Excel to generate siren activation reports. Reports are generated automatically following every siren activation including individual siren activations.

Reports are saved under C:\OptiWarnData\Reports and have a file naming convention as follows: YYYY-MM-DD_HHMMSS.xls.

2. SETUP

Navigate to the System Manager screen. Verify Microsoft Excel is running by making sure a flashing "R" indication does not appear in the Status Bar.

3. TEST

Step 1 Navigate to the System Manager screen.

Step 2 If Print/Save mode is set to Print, click on the Print Now button. A green line will appear below the button to confirm the report is in the process of being created.

If Print/Save mode is set to Save Only, click on the Save Now button. A green line will appear below the button to confirm the report is in the process of being created.

Step 3 If Print/Save mode is set to Print, the report will be generated and printed to the Windows Default Printer. If Print/Save mode is set to Save Only, the report will just be created without being printed.

Step 4 Verify creation of the report by clicking the Past Reports button which will open an explorer pop-up window listing the reports stored in C:\OptiWarnData\Reports.

Pass____ Fail____

VERSION #1.000

Alternate Activation Button – Red Button Activation

1. DESCRIPTION

The **OPTIWARN SIREN SYSTEM** supports an alternate form of siren activation. It is intended to be a simplified activation to only be used in an emergency. The Alternate Activation process is to be used at the Bolt Street - Fire Dispatch location. This activation method will activate all sirens in the system for Tornado Warning (full 3-minute emergency activation).

The Alternate Activation will be in the form of a large Red "mushroom" style button.

2. SETUP

In order to test the full 3-minute Tornado Warning activation, no additional setup is required other than the installation of the Red button in the Fire Dispatch Center.

However, if the full 3-minute activation is not appropriate for testing purposes, the push-button can be rewired to DI #8 instead of DI #5 on the FEP. Additionally, DI #6 will perform a 90-second test and DI #7 will perform a 15-second test.

The test can be monitored from the Bolt Street OptiWarn Control Center.

3. TEST

Step 1 Personnel should be monitoring the Bolt Street OptiWarn Control Center.

Step 2 Depress the Red button

Step 3 Confirm on the Bolt Street OptiWarn Control Center that all sirens have been activated for the proper operation (depending on the wiring of the Red button).

Pass____ Fail____

VERSION #1.000

7. Individual Siren Testing

The remaining tests detailed below will be completed on fifteen 15 sirens. Please note the siren site number in the appropriate location for each test.

Siren Site Testing - Whelen Electronic Sirens (non-activation status)

1. DESCRIPTION

The **OPTIWARN SIREN SYSTEM** has the ability to function with several different siren types including different manufacturers even in the same system. The testing for each siren is specific to the siren manufacturer and model.

2. SETUP

Navigate to the Map screen by clicking COMMAND on the Menu.

At the site, the ACE RTU should be appropriately connected to the Whelen Siren including power (if applicable), RS232 communication, box intrusion (if applicable), and Live PA audio (if applicable).

3. TEST

Step 1 Right-click on the Siren Icon for the site to be tested to view the Single Site Status pop-up.

Step 2 Verify all site status appears normal with all siren cabinet doors closed.

Step 3 If Intrusion detection is included, open the siren controller cabinet door and verify Intrusion alarm appears for the site.

Step 4 Close the siren controller cabinet door and verify Intrusion alarm returns to normal.

Step 5 Repeat for the siren battery compartment and the ACE cabinet to confirm any of the cabinet doors will report an Intrusion alarm when open.

Step 6 If the siren is AC-powered with battery backup, disconnect AC power from the siren and verify Siren AC alarm appears for the site.

Step 7 If the ACE RTU is AC-powered with battery backup, verify RTU Input Power alarm appears for the site.

Step 8 Return AC power to the siren and verify Siren AC alarm returns to normal and the RTU Input Power alarm returns to normal.

Step 9 Disconnect the RS232 cable between the ACE RTU and Whelen Siren controller and verify Siren Communication alarm appears within 30-45 seconds.

Step 10 Reconnect the RS232 cable and verify Siren Communication alarm returns to normal.

Siren Number_____ Pass____ Fail____

Siren Site Testing - Whelen Electronic Sirens (Silent Test)

1. DESCRIPTION

The **OPTIWARN SIREN SYSTEM** has the ability to function with several different siren types including different manufacturers even in the same system. The testing for each siren is specific to the siren manufacturer and model.

2. SETUP

Navigate to the Map screen by clicking COMMAND on the Menu.

At the site, the ACE RTU should be appropriately connected to the Whelen Siren including power (if applicable), RS232 communication, box intrusion (if applicable), and Live PA audio (if applicable).

3. TEST

Step 1 Right-click on the Siren Icon for the site to be tested to view the Single Site Status pop-up.

Step 2 Verify all site status appears normal except Intrusion with siren controller cabinet open.

Step 3 From the front panel of the Whelen controller, press the button labeled Silent Test to initiate an amplifier test of the siren.

Step 4 With a fully functional siren, the FULL and PART LEDs should illuminate on the siren controller. Verify a False alarm appears for the site. If any amps function properly, the PART LED will appear...if all the amps function properly, the FULL LED will also appear.

Step 5 With the ACE RTU cabinet open, open the ACE CPU door and press/hold the push button labeled PB for 2-3 seconds. Verify the Whelen siren runs a local Silent Test.

Step 6 Verify the False alarm resets to normal, Local Test status appears bright green, and Full status appears bright green along with Command Confirm..

Step 7 If the siren is a rotating siren, verify the siren head rotates for the duration of the Silent Test, the ROT LED illuminates on the siren controller and verify the Rotation status appears bright green.

Step 8 Disconnect the RS232 cable between the ACE CPU and the Whelen Siren Controller.

Step 9 Press and hold PB for 2-3 seconds. Verify the Whelen siren does NOT run a Silent Test.

Step 10 Verify Command Failure alarm indicating the siren failed one or more RS232 command functions and Command Confirm is clear.

Siren Number_____ Pass____ Fail____

Siren Site Testing - Whelen Electronic Sirens (Remote Activation Test)

1. DESCRIPTION

The **OPTIWARN SIREN SYSTEM** has the ability to function with several different siren types including different manufacturers even in the same system. The testing for each siren is specific to the siren manufacturer and model.

2. SETUP

Navigate to the Map screen by clicking COMMAND on the Menu.

At the site, the ACE RTU should be appropriately connected to the Whelen Siren including power (if applicable), RS232 communication, box intrusion (if applicable), and Live PA audio (if applicable).

3. TEST

Step 1 Right-click on the Siren Icon for the site to be tested to view the Single Site Status pop-up.

Step 2 Verify all site status appears normal except Intrusion with siren controller cabinet open.

Step 3 Click the Siren Icon to select the siren for activation. Click Silent Test and click START.

Step 4 With a fully functional siren, the FULL and PART LEDs should illuminate on the siren controller.

Step 5 If the siren is a rotating siren, verify the siren head rotates for the duration of the Silent Test, the ROT LED illuminates on the siren controller and verify the Rotation status appears bright green.

Step 6 Within a minute after the command completes, Full or Partial Activation should illuminate along with Siren Rotation if applicable on the OptiWarn Control Center.

Step 7 If a Full Activation was received, disconnect one of the amplifiers and rerun the test. The results should be similar to Step 6 except Partial Activation should illuminate instead of Full Activation.

Step 8 Reconnect the previously disconnected amplifier, but disconnect the rotor and rerun the test. The results should be similar to Step 6 except Siren Rotation Fail should illuminate instead of Siren Rotation.

Step 9 Reconnect the rotor, but disconnect all the amplifiers and rerun the test. The results should be similar to Step 6 except Activation Failure should replace Full or Partial Activation.

Step 10 Reconnect the amps and rerun the test. The results should match those from Step 6.

Siren Number_____ Pass____ Fail____

Acceptance Test Plan Sign-off

By their signatures below, the following witnesses certify they have observed the system Acceptance Test Procedures detailed above.

CUSTOMER REPRESENTATIVE:

Please Sign Name: _____ Date: _____

Please Print Name: _____ Initials: _____

Please Print Title: _____

MOTOROLA SOLUTIONS REPRESENTATIVE:

Please Sign Name: _____ Date: _____

Please Print Name: _____ Initials: _____

Please Print Title: _____