92 Lighthouse Drive, Jupiter, FL 33469

Executive Summary
First Responder Common Operating Picture with Seamless Communications

Interoperability and sharing a Common Operational Picture has been the stated goal of First Responders and the military for more than a quarter of a century. When First Responders arrive at the scene from different parts of the country and from other government agencies, it is oftentimes the interoperability issue that compromises the effectiveness of emergency response.

First Responder Units, Energy and Utility Companies and in cases of significant events the National Guard need a means to automatically network between each other with equipment and communications on hand.

AGIS provides this ability by registering at a website and requesting download of LifeRing™ software. Once loaded, the LifeRing software enables immediate interoperability between the off the shelf PCs and iPhone and Android Smartphones at least one of which are carried by almost all. All who downloaded the software enter a common disaster response name are automatically networked together. Once networked all responding units appear as georeferenced symbols on the LifeRing enabled PCs and Smartphones.

LifeRing users enter geo-locations of events such as fires, accidents, etc. for all to view by touching a location on the map. LifeRing enables all the users to rapidly exchange encrypted data, video and Push to Talk (PTT) with each other by simply touching (using a mouse or finger) the other units' georeferenced screen symbol. Similarly, using the same method LifeRing users can send an: a. Emergency notification, b. Chat, c. Send d. Text, e. Photos and f. Video clips, g. Whiteboard, h. Enter and Exit geofences, i. Full Motion Video, and j. Send commands to other users. All this digital activity is transmitted in near real time between users and to any central command hub. The PC and Smartphones can communicate with each other via cellular, Band 14 cellular, P25 radios, Military radios, and handheld satellite communications devices in any combination, i.e. some can be on cellular others on P25 radios. LifeRing also provides routing information to reach those in an Emergency situation.

LifeRing OVERVIEW
**Low Cost + Easy To Use + Secure Data and Voice Communication Across Agencies**

Responding to disasters and safeguarding critical physical and human assets – whether on a battlefield, at sea on a Coast Guard ship or boat, on an oil rig at sea, or on a military installation, city street, college campus, hospital, subway tunnel – requires information collaboration and integration of data from many disparate data sources so that a complete integrated common 'picture' of the incident scene is seen by all.

The notion of a Common Operational Picture (COP) to assist in Command and Control is not new. What is new however, is the ability to interconnect different agencies quickly and automatically that are responding to a disaster. Having a COP so that all understand the incident and where the responders are located can play a vital role in achieving not only DHS goals but also the goals of the National Guard, Coast Guard, state, local and municipal organizations as well as responding to the needs of utility companies.

A COP might be defined as a single, holistic display of relevant operational information shared by ALL in a team of operatives and in the Incident Command Center. Having all being able to view and interact with the COP facilitates collaborative planning and assists incident responders in providing a rapid response to an incident.

Prior to 9/11, tactical command and control for incident and disaster response was primarily accomplished by deploying expensive and often proprietary equipment that relied mostly on low bandwidth Land Mobile Radio (LMR) connectively.

AGIS pioneered the tactical use of small form factor Smartphones as a response to the 9/11 World Trade Center tragedy by creating a system based on familiar PC and Smartphone software to meet the fact that Responders needs are now more complex and fluid than ever before. AGIS' LifeRing software is a single app that loads on any PC, Android or iOS device as well as most Web browsers and enables real-time, situational-awareness and PTT communications between all smartphone, tablet and PC users to create a scalable COP - system of the mapped area and the precise location of all responders and the dangers to those responders. LifeRing resolves the different type of communications (LTE cellular, First Responder P25 radios, and even handheld satellite and military radios) so that all can intercommunicate. Furthermore, LifeRing establishes a common AES 256 bit encryption key between all users so that all can PTT between each other, chat, message, whiteboard, etc.... enabling a disaster-wide private secure communications.
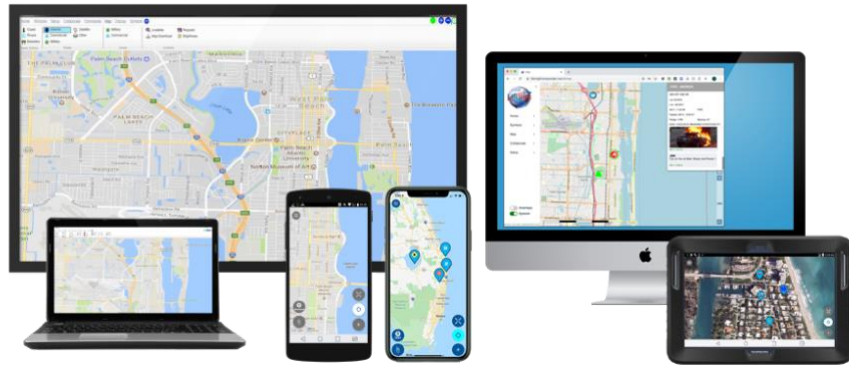
During a major disaster, responding units are assembled from various organizations that are in the impacted area and organizations that are outside of the impacted area. Some of these organizations have worked together in the past, and have established communications plans, others are joining the response team for the first time. AGIS developed LifeRing to address this very combined organizations response issue and supports downloading the software even when en route to the disaster.

Software that integrates all users with a Coordination, PTT, Video and commond in a Common Operational Picture

LifeRing then enables all organizations to rapidly intercommunicate using encrypted PTT and data communications. The fact that almost all today carry their own Smartphone makes the possible. Since LifeRing uses IP for data communications the cost of cellular usage for Smartphones is normally very little. The Smartphone's small size and weight make it easily portable, and the battery size makes carrying spares virtually trivial.

However, since most First Responders use P25 Land Mobile radios, LifeRing is designed to be cabled to Land Mobile P25 Radios as they have unique features of (a) much higher transmit power and, (2) the ability to communicate without a cellular base station. When other communications means are desired, LifeRing can be used with Mesh networks and Iridium phones or even military radios. Since all are automatically networked together through the LifeRing server, different types of communications are automatically made interoperable.

LifeRing addresses many of the critical information requirements of: Fire, Police, Emergency medical service, power and phone and gas utility personnel, National Guard as well as Non Governmental Organizations (NGO's) and humanitarian relief workers like the Red Cross who are responding to disasters.

These core requirements include rapid text message exchange, emergency hot button, PTT communications, data exchange, such as web access and file transfer, geo-location, and near-real time imagery and video.

One of LifeRing's unique differentiator is that the software has the capability to forward/exchange information between organizations that use different types of communication devices seamlessly including many different types of military radios. This ability assures that all interconnected LifeRing systems have the same COP.

AGIS' LifeRing software enables a common familiar and consistent look and feel based on either Microsoft typical software Users Interface (UI) or a Google map (UI) across these diverse commercial, ruggedized and military communications platforms. LifeRing enables the Incident Commander (IC) to establish responding organizations into Groups, as an example, there can be an Incident Commander's Group where he views all on the network, a Police group which is only viewable by police, a Fire Department group which is only viewable by the responding Fire Departments.
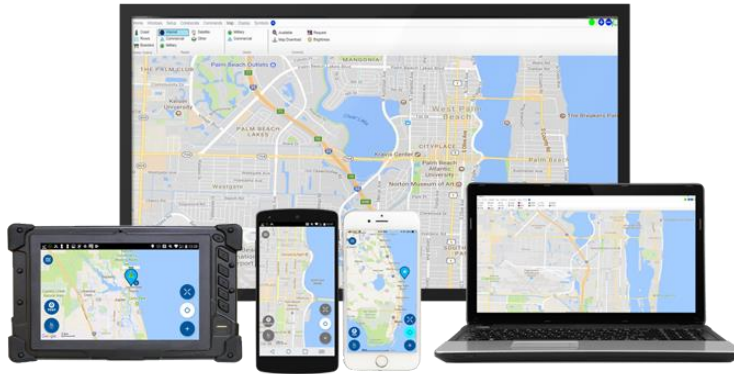
Features:

- Attach text and photos to symbols
- Create geo-referenced whiteboards
- Send text and photo messages
- Join different groups of participants
- Chat and message other participants
- Touch user symbol to talk one-to-one
- Full motion video from Android camera
- Request immediate position reports
- Declare emergency
- Overlay and display various maps
- Tap screen togeo-position symbols
- Digital geo-fences and crossing alerts
- Transmit and receive commands

To interact with their display LifeRing users simply touch the display at the desired map location and then select the appropriate symbol, which appears at the correct map location. LifeRing operators use a similar method to communicate between each other by simply touching the symbols of the LifeRing network participants. LifeRing is capable of accepting full motion video inputs from fixed video cameras, cell phone cameras and Unmanned Aerial Systems (drones).

We now have the ability to access data from databases outside of LifeRing to create an even more dynamic COP. Marker symbols and data can be imported quickly populate the map with known landmarks like Hospitals or Police Stations. We can also import Overlay files to show things like fire hydrants or electrical boxes.
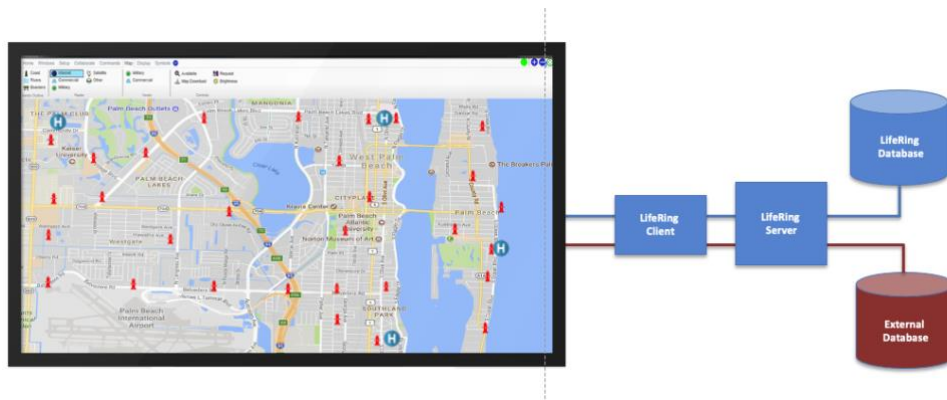
Notify allows the PC to send messages to large groups of users. The recipients of the message can be chosen by the either all current active users or by selecting a boundary that includes all users inside of it. Box Bounds and Poly Bounds permit you to define an area on your screen and to send a message to all users that are geographically located inside that area.

Three types of messages can be sent:

1. You can select to send the message to all active LifeRing Users. The data entered in the Text box is sent, using normal LifeRing Messages. If a LifeRing user has intermittent comms, the message is temporally held until the user reconnects to the server.

2. You can select to send a GCM Plain Text Message. The information is then sent, via GCM, to every handset that has ever connected to this LifeRing server.   The message is sent using GCM Android and iOS notification technology and will be received if the recipient's Smartphone is active or when they turn their Smartphone on.

3. You can select to send a GCM LifeRing Wakeup Message to users not currently running LifeRing. It is received by Android and iOS Smartphones and is labeled "Priority Message." If they tap on the Notification, LifeRing is automatically activated on their Smartphone.

LifeRing provides a large number of Capabilities:

- ✓ Low Cost, Integrated, Familiar and simple to use.
- ✓ Securely operates on PCs, Androids, and iPhones.
- ✓ Exchanges location data, Emergency notifications, Messaging, Chat, PTT, Full Motion Video, Geo-fences, Whiteboarding, Orders, Medical and Logistics information.
- ✓ Operational/Situational Awareness that can be the difference between mission success and failure; life and death
- ✓ First Responders, Law Enforcement Personnel, National Guard units, EMTs and others now able to communicate between themselves and centralized Incident Command and Control
- ✓ A COP, a single, holistic display of relevant operational information shared by a team of operatives and viewed by centralized Incident Command and Control
- ✓ Collaborative planning and coordinated response
- ✓ A variety of maps to include imagery, geologic, military, U.S. data, etc.
- ✓ Targeting of other LifeRing users to securely receive data and photographs from transmission through the LifeRing Server.
- ✓ Digitally draw on the map screen for all LifeRing participants to see.
- ✓ Display map overlays and geo-fences.
- ✓ Operate in an environment using GSM, CDMA, Wi-Fi, Cable, P25 Radios, handheld Iridium satellite devices, MANETs (Mobile Ad-hoc Mesh Networks) and military radios and work seamlessly using any or all simultaneously.

- ✓ Push to Talk with any other LifeRing participant without being limited by network carriers or devices.
- ✓ Voice Touch to make a phone call, and PTT
- ✓ Display range, bearing, heading, speed, altitude, phone signal strength, battery strength, and GPS
- ✓ Create formatted messages (i.e. SPOT, MEDEVAC, Explosive, etc.) for all LifeRing participants.
- ✓ Add in symbols for people/vehicles/points of interest that are not on Network.
- ✓ Attach text, photographs and video to PLI and symbols.
- ✓ Data networks and voice PTT channels that are easily changed and permit up and down and across the Chain of Command.
- ✓ View lists of network participants.
- ✓ Interface with National Guard Military Command and Control System, and other functions.

LifeRing Real Time Capabilities Provide to All Users:

- ✓ A digital display of Participant Locations on a Color Map
- ✓ Over 80 Map Types and Satellite Imagery are Supported including Google Maps
- ✓ The Location and Status Information is Automatically Transmitted between Participants to include:
    - o Latitude
    - o Longitude
    - o Speed
    - o Range
    - o Battery and Cell Status
- ✓ Communicate with other participants through the use of:
    - o Voice, Text and Photo Messaging
    - o Emergency Alerts
    - o Entry of Geo-referenced symbols by touching the map selecting the symbol
    - o Streaming Video
    - o Whiteboard
    - o Chat
    - o Push to Talk (PTT)
- ✓ Symbols are Customizable for Military or Civilian Use
- ✓ Custom Reports (i.e. MEDIVAC, IED, Spot Report)
- ✓ Inset Mini-Map on the PC displayed the location of all symbols regardless of zoom level
- ✓ Participant History Trails
- ✓ Tracking the Movements of Objects and Groups.

In addition to the functions listed above, LifeRing Real Time Capabilities provide these additional functions to PC Users:

- ✓ Issue Commands
- ✓ Create/Control Geo-Fences
- ✓ Display of up to 8 videos in a simultaneous view
- ✓ Display more COP data simultaneously
- ✓ Control of the Server (if a Server is used)

As can be seen below the LifeRing Users Interface makes the software intuitive and easy to use.

LifeRing Usage with Various Types of Communications.

LifeRing Smartphones, PCs and Tablets have been successfully interfaced with many of the major cellular, radio, Mobile Ad-hoc Mesh Networks (MANETs) and handheld satellite providers. See below.

LifeRing Communication and Encryption Types

Public Cellular	Private Cellular	Military and First Responder Radios	Mesh Networks	Satellite	Encryptions
• AT&T • Verizon • Sprint • T-Mobile • European • Malaysian • Thailand	• Radisys • LEMKO Band 14 • RIVA • AltoBridge • Rivada • Qualsomm • LGS (WiMAX) • OCEUS • Lockheed (MONAX) • TLC • ELTA	• Motorola • Harris • Thales/GDC4 • xG Technologies	• Rajant • Persistent Systems • Thales / GDC4 • TrellisWare • AGIS Low Cost MANET	• Iridium • Netted Iridium • Inmarsat • WIN-T • ViaSat • Thuraya • BGAN	• AES – 256 BIT • Dept. of Commerce Approved Private Algorithm • Csfc • Type 1

LifeRing has successfully used all the above communication types in various combinations

Most radios are designed to interface with Microsoft PCs and Tablets using the Remote Network Driver Interface Specification (RNDIS) for their USB port. While it is easy to interface PCs with radios using the RNDIS interface, unfortunately, all most all Android and iPhones are not designed to accept the RNDIS interface. This has created significant system integration issues. In the past, the only way for a DMR, P25, Harris or other RNDIS enabled radio to interface with an Android Smartphone/Tablet was by either one of these three methods:

> • *Rooting the Android device (which limits the ability to use software updates to the Android device and does not permit use of devices from other manufactures),*

> • *Paying the Android phone manufacturer to create a special USB RNDIS I/O interface (very expensive and limits the ability to use the Android device software updates or devices from other manufactures) or*

> • *Use special, expensive cables that require their own power source. (creating a yet more tangled interface cable mess).*

Obviously, all these approaches are not First Responder or militarily operationally attractive. AGIS' approach to resolving this interface issue is totally different and consists of loading a new AGIS software package on the Android device that enables the radios with a RNDIS I/O driver to connect via USB cable to Android.

Smartphones that have installed AGIS' LifeRing software. This enables the radios to be part of the LifeRing data network, which can include LifeRing cellular Smartphones thus enabling exchange of a COP.

Motorola P25 Radio   Motorola DMR Radio

While the RNDIS driver enables data communications between cellular and P25 and other radios for those responding to the disaster, it does not resolve the voice PTT issue. To meet that requirement AGIS provides the AGIS RGU (Radio Gateway Unit, which provides a PTT interface between LifeRing users utilizing PCs and Smartphones with Internet communications and those using P25 and DMR radios. AGIS uses a different method to allow military radios to be part of the LifeRing digital and voice network.

You can find more about the LifeRing's First Responder software by going to our website at https://www.agisinc.com/videos/1st-responder-videos/

DIB-AGIS ASSIST

In 2017 DIB-ISAC contracted with AGIS to provide a customized version of LifeRing and a new product, DIB ASSIST, which is designed for First Responders, the Incident Command Center and for businesses and their employees in the area of a disaster. AGIS' ASSIST software is an app on the users Smartphone that is automatically activated by the Incident Command Center or if an ASSIST user chooses to report a significant event to the Incident Command Center. Once activated it provides for complete two-way communications with the Incident Command Center and the responding First Responder.

DIB ASSIST was provided to First Responders active in the response to Hurricanes Harvey and Irma. Using a select group of users, DIB ASSIST was used to track groups of responders involved in various missions. One group sponsored by Thin Blue Line, was monitored from the Huntsville AL EOC (Emergency Operations Center) as they travelled to the affected areas of Beaumont, Texas to deliver supplies. The DIB ISAC EOC was able to see the convoy in real time and provide routing data and ingress/egress directions for the group. This collaborative effort on the part of the DIB ISAC EOC and the convoy drivers effectively saved time and provided a heads-up to potential traffic and access issues. DIB ASSIST proved to be a simple, yet powerful force multiplier in this situation. Drivers were able to use their own devices and did not have to rely on spotty radio coverage and access to repeaters.

DIB ASSIST was issued to a Local Search Dog unit as well. Again, with the ability to use one's mobile device, the level of communications was dramatically improved and the number of team members that could be linked into the system was greatly increased.

DIB ASSIST was also issued to individuals that were responding to family issues to test the ability to support focused efforts outside of the response mechanism. These individuals were tracked in real time by the DIB ISAC EOC and again, were given intel on traffic, ingress, egress, and - in one situation – the locations of functioning pharmacies.

DIB ASSIST was also integrated into a non-traditional safety/response environment in a large scale 5K swim. Used in conjunction with traditional radios, DIB ASSIST was used to track vessels on the water and their locations relative to at risk swimmers. The rescue teams were able to more effectively put assets on the proper incident, based on location and level of support needed. The whiteboard function of DIB ASSIST allowed the Incident Command Center to quickly diagram movements and positioning.

DIB ASSIST was used in a functional exercise, integrating UAS surveillance, response, and common operating picture. Various responding units were able to see - in real time - the location of en route assets, victims, and the location of a perpetrator. Again, the whiteboard function provided an enhanced visualization of the operational area and geographic location of all players.

You can find more about AGIS ASSIST software at https://www.agisinc.com/videos/Assist

LifeRing Deployments and Successful Exercises

The operational utility of LifeRing has been proven in a wide variety of test bed and Operational environments some of which include:

- New York Emergency Operations Center Test
- National Incident Management System (NIMS) Test
- Coalition Warrior Interoperability Demonstration (CWID)
- Army Network Integration Evaluation (NIE 12.1, 12.2 and 13.1)
- Numerous US Joint Chiefs of Staff Exercises
- The Defense Intelligence Agency. (LifeRing won 4 Stars in the DIA's PLUGFEST)
- SOCOM TNT Exercises (2012 & 2013)
- US NATO Bold Quest (2012, 2013 & Scheduled for 2014)
- Joint-Interagency Field Experimentation (JIFX) Exercises
- Army Expeditionary Warrior Experiment (AEWE 2013 and Scheduled for 2014)
- Jolted Tactics
- US Navy
- Australian Defense Forces
- Malaysian Defense Forces
- Dutch Defense Forces
- Thailand Defense Forces
- Israeli Exercises

Conclusion

AGIS LifeRing software was developed by United States military veterans as a response to the September 11th, 2001 terrorist bombings. Since that time, the company has continued its development efforts; leveraging the technological advances in modern PCs and Smartphones as well as communications methods.

AGIS's LifeRing software enables PC, iPhone and Android Tablet and Smartphone users to easily establish ad hoc COP networks where many people need to coordinate and collaborate with many others. LifeRing automatically connects everyone in a many-to-many encrypted voice, data and video network that provides all with a handheld Tactical Operations Center.

LifeRing enables all on the network to Collaborate and Contribute to the COP and affords Commanders the ability to issue "Must respond to" commands from their PCs. LifeRing is a key software component of JCS J6's Jolted Tactics System due to its proven ability to interface with different C4ISR systems and sensors.

LifeRing provides all users with the present location and status of all others. Events of interest are entered as symbols on a computer generated map display. This is ideal for surveillance, search and rescue, incidents, disaster response, security, border protection and combat.

LifeRing software uses GPS to provide location data. Users can seamlessly enter geo-locations of events or objects by selecting the desired map location and then the appropriate symbol. Information about other networked users and symbols is obtained by touching the symbols. Over 80 map types and satellite imagery are supported.

LifeRing communicates with First Responder systems using DHS (IMDE-CSS) Track Sharing and DHS Common Alerting Protocol and with military C3 systems (GCCS, JCR, C2PC, AWACS and

other aircraft using Link 16, AFATDS, etc.) using an OTHGOLD, JVMF or Cursor on Target (CoT) and other interfaces. LifeRing also supports AIS, KML, Sonar, Seismic sensor and other data link interfaces. Additionally, LifeRing interfaces with Hazmat databases, current weather imagery and a video distribution system that uses a cell phone 's camera or a helmet-mounted camera.

The Honolulu Police and National Agencies successfully used LifeRing for President Obama's hosting of the APEC meeting in Honolulu in 2012. For our participation AGIS received the following letter.

CITY AND COUNTY OF HONOLULU

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OUR REFERENCE   CK-JK

February 3, 2012

Mr. Malcom Beyer, Jr.
Chairman/CEO
AGIS
177 North US Highway One, Box 300
Tequesta, Florida 33469

Dear Mr. Beyer:

On behalf of the men and women of the Honolulu Police Department (HPD), I would like to express our sincere appreciation to you and your personnel for the outstanding partnership that we shared in preparing for and during the 2011 APEC meetings.

Your assistance greatly helped us in our efforts to ensure the security and safety of the public, the world leaders, and the other attendees during the APEC meetings that were held from November 7 to 13, 2011. The success of our law enforcement and security operations was the result of everyone working together, and the HPD was very fortunate to have had your support.

Mahalo nui loa and best wishes.

Sincerely,

LOUIS M. KEALOHA
Chief of Police

Serving and Protecting With Aloha