



## Crystal TETRA Edition – White Paper

*Crystal TETRA Edition provides unprecedented levels of functionality, usability, flexibility and integration for the Public Safety- and Mission Critical Communications sectors. By leveraging hybrid technology and mixing 3G/LTE network communications with TETRA; Crystal Code delivers Order management, Customizable Workflows, GIS/Maps, Mobile/Central Dispatching, Digital Documents, Digital Blueprints, Messaging, Navigation, Photos and Videos, Alarm Functionality and a Generic Integration Interface for interfacing with any backend system.*



## Executive summary

The TETRA landscape of today has extremely limited functionality when compared to contemporary Mobile Enterprise Solutions. Crystal TETRA Edition effectively bridges the gap between the two worlds by providing efficient tools for Order management, Customizable Workflows, GIS/Maps, Mobile/Central Dispatching, Digital Documents, Digital Blueprints, Messaging, Multimedia, Navigation, Alarm Functionality and a Generic Integration Interface for interfacing with any backend system.

By leveraging the high speed 3G/LTE network for transferring large volumes of data (encrypted and compressed), and the reliability of TETRA to transfer sensitive prioritized low volume data; Crystal TETRA Edition is the natural choice for any organization looking to increase efficiency, task fulfillment and responsiveness.

Due to the hybrid nature of Crystal TETRA Edition the functionality is available on a wide range of mobile devices, from user friendly iPhones/iPads to ruggedized Android and Windows Mobile. We have developed a straightforward, user friendly and unified product that can be utilized for the coordination of everything from firefighting vehicles to search and rescue parties. The product is standalone but can be integrated with existing backend systems in order to fully support your business processes.



### Crystal TETRA Edition provides your organization with the following benefits

- Realtime information and complete control regarding assignments, alarms and resources.
- The possibility to replace paper based incident action plans with digital documents readily available in the mobile device.
- The possibility to take the fastest route to the place of an assignment.
- 100% location accuracy of the place of assignment and 100% task fulfillment on locating the place of assignment.
- Seamless integration with your current work flow.
- Easily send messages (SDS) to your preconfigured team.
- Streamline communication between units operating in the field by using the group chat of the Crystal Messaging Module.
- Instantly find colleagues in the address book of the Crystal Messaging Module.
- Push voice communication group settings to the mobile devices.
- Complete Over The Air control of the settings on the TETRA devices through the Crystal MDM Module.
- Easy scheduling and dispatching of resources by drag and drop on a map.
- Decreased paper based administration with time reporting and order management means that your organization can focus on solving the task at hand instead of the papers.
- Configurable task oriented workflows that guides the user through all the steps for a certain task; thus both simplifying the task and providing quality assurance by requiring that all mandatory steps are carried out.
- User based language selection.
- Increased security for the personnell with several types of distress alarms.
- Increased possibilities for lone worker scenarios due to the alarm functionality.
- Complete geographical overview of all resources.
- Customized map material with layer functionality showing exactly the GIS-information that the user needs to fulfill the task (electrical powergrids, gas grids, water grids and zones).
- The possibility to take photos and videos at incidents and automatically store them with the other incident documentation.
- Seamless integration with your existing backend systems.



**Crystal TETRA Edition is a fully featured turnkey solution that supports**

- Order management.
- Unified messaging.
- Convenient dispatching, scheduling and re-scheduling of resources (mobile and centralized).
- Time reporting.
- Customizable workflows/Checklists.
- Any language of your choice.
- Alarm functionality (man down signaling, distress or timer based running on the server).
- Positioning.
- Navigation.
- Digital Documents including blueprints and incident action plans.
- GIS/Maps.
- Multimedia.
- Integration with one or several backend systems including common ERP-systems as well as dispatching systems.
- Module based design. Use all the modules or just one, it is configurable according to customer preference.
- Quick implementation and education; with Crystal TETRA Edition it is easy to start using the main features straight away and then later on implement more advanced features.
- Feature rich yet customizable; all features and functions are customizable according to the customers preference.





## Technology

Crystal TETRA Edition is a blend of different technologies and was conceived from the first line of code written to be a multiplatform solution with support for the majority of contemporary operating systems. This state of mind has also led to the choice of supporting seamless switching between TETRA and 3G/LTE; as well as creating backend integration functionality for supporting any type of LOB/backend solution.



### HTML5-hybrid

Crystal TETRA Edition is built upon hybrid technology utilizing native device functionality as well as revolutionary HTML5 functionality. This effectively means that you can run the application on a variety of different platforms and operating systems.

### HTML5-hybrid benefits

- Adaptable user interface.
- Online/Offline functionality.
- Available for Android.
- Available for iOS.
- Available for Blackberry
- Available for Windows Mobile.
- Available for Windows Phone.
- Available for Windows 7 and 8.
- Available for Linux and MacOS.





### Hybrid communications

Communications are handled by a proprietary module that prioritizes, encrypts and compresses data. The module also determines if data should be sent via TETRA or 3G/LTE. The priority functionality guarantees that the most urgent data is delivered first, less urgent data always has to stand back in order for urgent messages to be handled swiftly. The encryption shields for eaves dropping and the compression effectively ensures optimal utilization of bandwidth.

### Hybrid communication benefits

- Two networks means increased redundancy for communication.
- Two networks means that the users are not limited by the low data transfer volumes of TETRA in the majority of situations.
- 3G/LTE speed makes it possible to transfer incident action plans, video, photos and other large volume data.



### Generic integration

The integration with other systems is handled by a proprietary module that converts, transforms and translates data to and from each respective system. The module has support for all common file formats including XML, JSON, Flat files etc, as well as all common methods of data transfer like FTP/SFTP, HTTP/HTTPS (web services), MSMQ/IBM MQ and raw TCP/IP.

### Generic integration benefits

- Crystal TETRA Edition will fit neatly into your existing infrastructure with a minimum of effort needed for implementation.
- You can easily fit Crystal TETRA Edition with your existing business processes.

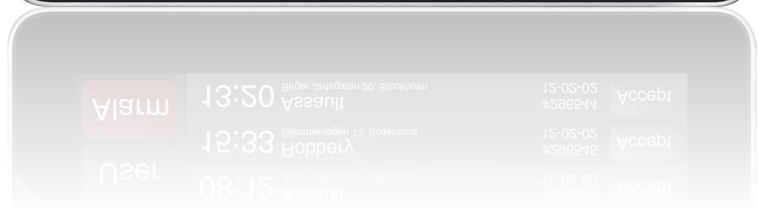
## Order Management

*With the order management module the organization has a detailed overview of all orders/incidents/assignments/errands. Quick and easy information entry as well as thorough follow up reporting are the corner stones of this module.*

The core of every Public Safety organization is built upon the services that it provides to the population. In order to be able to execute the tasks associated with these services the users need comprehensive support for their daily tasks. The Crystal TETRA Edition Order Management Module takes all the guess work out of the day to day operations for the users. With the touch of a finger all data regarding a specific assignment including incident information is presented.

### Order Management Module benefits

- Customizable for several different types of Mission Critical Communications sectors.
- All vital information presented in a user friendly interface.
- Overview over all current incidents.
- Register new orders/incidents/assignments in the field.
- Mandatory fields minimizes input errors.



## Unified Messaging

*The possibility to communicate via short written notes is a convenient and time saving feature.*

Communication is vital to any successful operation, whether it is firefighting vehicles coordinating a rescue or public safety addressing a flood the key to success spells communication. The Crystal TETRA Edition Messaging Module makes it easy to send SDS messages to a group or individuals. The address book makes it easy to send messages and create collaboration teams.

### Messaging Module benefits

- Send messages to people not to generic numbers.
- Easily send messages (SDS) to your preconfigured team.
- Streamline communication between units operating in the field by using the group chat.
- Instantly find colleagues in the address book with auto-completing search.





## Dispatching

*The correct utilization of resources is a key objective in order to be able to execute all missions in a timely manner.*

The dispatching of assignments to resources is greatly simplified by the dispatching module. Since the module is available on the dispatching central as well as on mobile pad-style devices a central dispatcher can monitor groups of self organizing field units.

### Dispatching Module benefits

- Mobile dispatching makes it easy for field teams to organize their efforts.
- Central dispatching.
- Complete overview regarding assigned and unassigned tasks.



## Alarm

*The possibility to raise a distress signal is often a vital factor of survival and greatly reduces the stress for personnell operating in hazardous environments.*

The Alarm module has several modes that enables the user to set different types of timer based alarms as well as urgent distress signals. When configuring a timer based alarm running on the server the information is stored and the alarm will sound independently of the users device. This means that the user can be in a communication blindspot or the have the battery run dry in the device and yet receive assistance when required.

### Alarm Module benefits

- Set timer alarms running on the server.
- Immediate distress signaling.
- When the alarm is triggered the distress signal goes both to the dispatching central as well as to other unit operating in the vicinity.



## Positioning

*Accurate and up to date information on the location of all units is vital for several functions in the solution.*

The Positioning module constantly feeds geolocation to the other modules in the Crystal TETRA Edition and is a prerequisite for the navigation, alarm and map functionality.

### Positioning Module benefits

- Makes the dispatcher able to pinpoint the location of the device.
- Enables other modules to consume geolocation information.
- Enables other modules to present information based on geolocation.



## Navigation

*Voice and visual guidance makes sure that the units take the shortest route to and from incidents.*

The Navigation module is a very important tool that decreases the time between receiving the call to arriving on site ready for action. Depending on the situation, navigation can be based upon the street address for the assignment or if there is no street address available the position of the assignment.

### Navigation Module benefits

- Arrive on site with a minimum amount of delay.
- Find the way to remote locations that lacks street map coverage.
- The possibility to accurately estimate and report the time of arrival on site.



## Digital Documents

*Having blueprints and incident action plans readily available in a user friendly digital format is a great benefit compared to hauling paper.*

The Digital Document module makes it easy to carry several hundreds of incident action plans as well as blueprints and other data. Available in a convenient readable format on pad-style devices the documentation is easily digestible for the user.

### Digital Document Module benefits

- 100% up to date documentation.
- Immediate access to the documentation for the incident. No more flipping in folders of papers looking for the correct action plan.



## GIS/Map

*A complete overview of all units with call sign and information makes it easy to collaborate in the field.*

The GIS/Map Module makes it possible for mobile personnell to verify which units are closest to an incident for assigning resources as well as for communication purposes.

### GIS/Map Module benefits

- Support for mobile dispatching.
- Comprehensive graphic overview with regards to unit location and type of unit.
- Utilize customized map material including zone information etc.
- Display Points Of Interest.



## Multimedia

*Providing true multimedia capabilities including image capture, video capture and sound recording greatly increases the quality of information available to dispatchers.*

The Multimedia Module makes it possible for mobile personnell to attach images as well as sound and video recordings to their incident reporting. With 3G/LTE coverage it is also possible to stream video feeds from the scene of an incident directly to other units in the field and the dispatching central. This functionality makes it possible for incident commanders to have a much greater real time overview of an incident.

### Multimedia Module benefits

- Simplified documentation of incidents; often a few photos or a video says more than an essay.
- Provides a great overview for the dispatching central who can better assess a situation with visual information rather than voice or text.

