

PHOENIX G2 FIRE STATION ALERTING SYSTEM

Overview

The most important features of a fire station alerting system are: it alerts the correct units in a timely manner; increases situational awareness; it is reliable; and it is cost effective. Ultimately, these features help save lives and property. US Digital Designs ("USDD") has developed the Phoenix G2 Fire Station Alerting System (the "System") that meets these needs and builds on them to go beyond the minimum requirements. The System is the premier IP based fire station alerting system currently on the market, and has proven to reduce response times, alleviate stress to dispatchers by providing automated dispatching, and uses heart-friendly alerting tones and LED lights to help minimize responders' health issues. For these reasons and more, we are proposing the Phoenix G2 System as the replacement for the City of Joplin's current fire station alerting system.

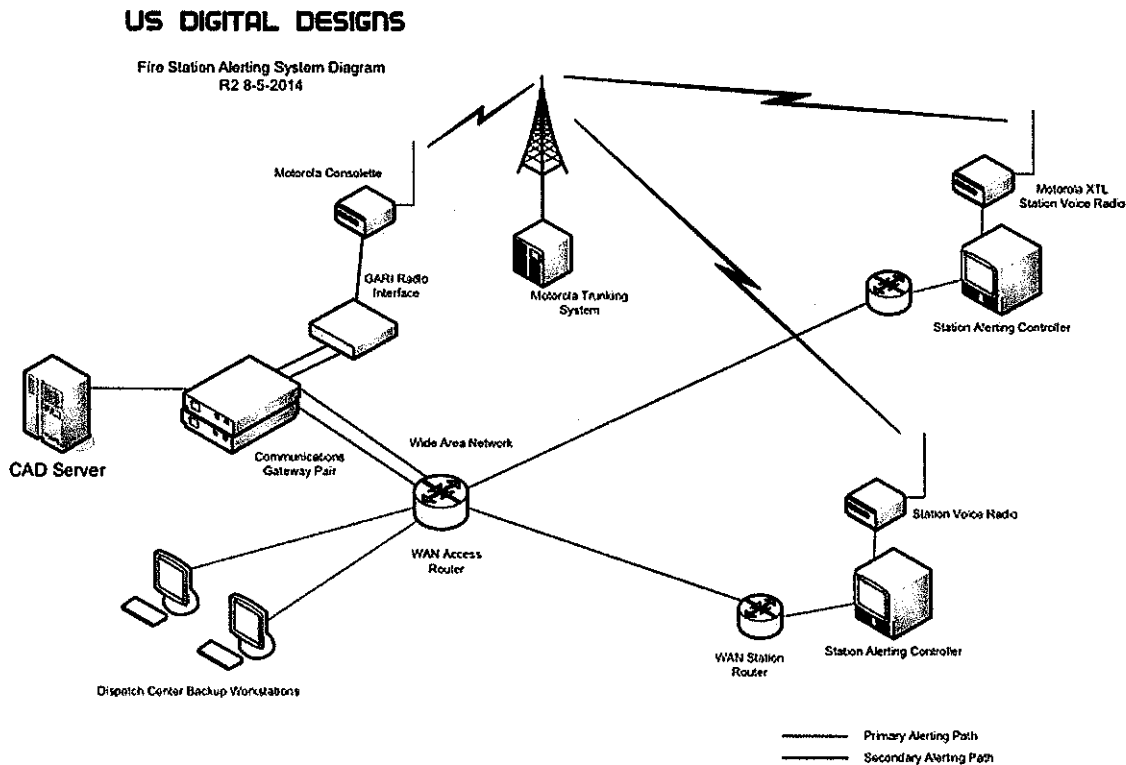
The Phoenix G2 Fire Station Alerting System will bring the best reliability, expandability, features and maintainability of any current fire station alerting system on the market. The System is built as an appliance model, with all hardware and software configured in its components and designed to easily integrate with the City's infrastructure. The System provides zoned alerting, information display signs, display and audio units for individual rooms, and automated voice announcement capabilities.

The System provides automated dispatching through its VoiceAlert announcements (automated voice) over radio channels and in fire/EMS stations, and on smart phones via the Phoenix G2 Mobile Alerting App. The System displays the dispatch information on message signs, TVs, monitors, projectors and video walls strategically located throughout the station, and can print the dispatch on one or more rip and run printers in the station. The System plays a ramped-volume heart-saver alert tone and then a System-generated voice announcement of the dispatch over the radio system, in the common areas of the station, in the dorm rooms of the assigned officers and responders, and over individual smartphones using iOS or Android platforms. The System also displays messages or audio alerts for non-emergency messages intended for fire and medical stations. The System can be configured for zoned alerting so that first responders in a station will be alerted if they are assigned to an incident, and not disturbed if they are not assigned to the incident.

The System has contributed to improving dispatchers' and responders' stress levels, increasing productivity, and has contributed to the reduction in response times. VoiceAlert automatic dispatch alerts can be delivered simultaneously to one or multiple stations in less than a second, helping to reduce or eliminate dispatcher 'on-hold' time. VoiceAlert is an alternative to a person speaking dispatch information for each call. The speech is generated in a fraction of a second and sent to individual stations simultaneously, relieving dispatchers of the time-consuming task of speaking with each station. This reduces dispatcher workload and oftentimes stress, enabling them to perform other time-critical tasks, such as processing the next call. The System also offers dispatchers a redundant system to communicate alerts if the CAD system fails. The System reviews the success of alerts as they are sent and monitors the status of the

system in real time which gives the dispatcher greater situational awareness. VoiceAlert automated announcements create a clear, consistent vocalization of the alert, and are delivered to station almost instantaneously. VoiceAlert coupled with the visual text message displays providing visual information on the dispatch can increase responders' situational awareness and assist in their mental preparedness, which helps units respond more quickly and efficiently. Some customers have credited the System in providing 30-90 second reductions in response time.

The Phoenix G2 system is comprised of a central Communications Gateway server pair that is located adjacent to an existing CAD system, and one or more Station Controllers and peripherals located in the fire stations. The Station Controllers are connected to the Communications Gateways using Wide Area Networks (WAN), radio data systems, or other communications methods. The peripherals are connected to the Station Alerting Controller in the fire station using standard TIA/EIA 568 Cat 5e or Cat 6 cabling, identical to that used by a standard local area network. Speakers and other devices are connected using common cabling. The System is all web-interfaced and can be displayed using any current web browser. The Station Status and Control web application is accessible by authorized personnel over SSL from a web browser that can access the System network, either remotely or at the station location.



Dispatch System

This proposal provides for a Communications Gateway pair to be installed at the Joplin 911 Center (either as physical servers or virtual servers). The Gateways will interface to the Central Square's OSSI / One Solution CAD system. The proposal also includes a Gateway Audio Radio Interface ("GaRI") to provide automated dispatches over the City's radio system. A detailed description of these components is provided below:

Communications Gateway

The Communications Gateway receives requests for alerts from the CAD system, reformats the messages through the Look and Feel process, and then transmits the alerts to the remote Fire Station Controllers, radios and smartphones using customer data, radio and cellular networks. If a voice announcement is required for the alert, the Gateway generates the announcement and transmits this along with to the Station Controller for announcement. The Gateway coordinates the retransmission of any failed messages and returns a final alert status to the CAD system, as well as displaying the status on the Gateway Dashboard status display. All communications between and through the Communications Gateway are time stamped and logged.



*G2 Communications Gateway – x2
1RU units provided for redundancy*

The Communications Gateway is a redundant hot-standby pair of servers running a custom Linux kernel with RAID 1 mirrored data disks, providing high availability. A second set of paired Gateways can be added to the System for further redundancy at a backup up dispatch center or disaster recovery site. Each set of Communications Gateways are capable of full system operations, and the database used in the System is replicated from one set to the other Gateway pair to keep system configuration in synchronization. The sets of Communications Gateways are otherwise identical in functionality and can be used simultaneously. *Note, a second set of Gateways is not proposed for this Project but can easily be added at a later date.* An application on each Gateway server monitors the performance of the running process and can restart the running process or cause a system failover from one system to the other in the event the running system become unusable. The system administrator can also cause a manual failover from the running system to the monitoring system.

The Communications Gateways communicate with the Station Controllers using UDP/IP or various serial data protocols, including radio data systems and network data is secured using DTLS authentication and encryption to prevent interception and impersonation. Multiple communications paths can be configured and operate together such that if one path fails, the system automatically uses the next operational path in priority order. The Gateways continuously poll the Station Controllers at a rate such that all stations are polled to verify connectivity and operation twice each minute. If the number of polls indicating a failed connection exceeds the configured threshold an event is triggered on the Gateway to display a

warning message and cause an audible alarm on the Station Monitoring and Control web application page. The Gateway can also be configured to notify email addresses of failure and recovery of each station's monitored circuits.

The Communications Gateways can be operated in a virtual environment. To operate in the virtual environment, USDD will require the City to provide the following at a minimum:

- VM Ware
- Two separate VM hosts each with the ability to house a VM with the following minimum specs:
 - 4 Processor Cores
 - 8 GB RAM
 - 64 GB Drive Space / Maximum Image Size
 - A minimum of 2 separate NICs, VLANs, or Virtual NICs/Switches

Additional networks will require additional network hardware or virtual network.

The pricing for a physical Communications Gateway and virtualized Communications Gateway is the same. Physical servers have been proposed for this Project. If the City is interested in using virtual servers, USDD will be happy to discuss this option with the stakeholders.

CAD Interface

The Communications Gateways support multiple different simultaneous CAD interfaces including interfaces to XML-based TCP-connected bidirectional interfaces and legacy serial interfaces using basic message parsing. The CAD interface receives an alert message from the CAD system and returns a Destination Status Message back to the CAD system indicating the success or failure of the alert to the involved Station Controllers. The System may also send event information to the CAD system based on configured activity events from the Station Controllers such as pushbutton presses. The ability of the CAD system to process these messages is dependent on the particular CAD system and not all systems can process these messages.

USDD has developed an interface to the Central Square OSSI / One Solution system used by several USDD customers. An interface is developed using the USDD XML alerting interface. USDD provides vendors an Implementation Guide, software development assistance, and can provide a development virtual machine instance of the Alerting System for use in testing by the CAD vendor. US Digital Designs is also willing to make necessary additions or modifications to the CAD interface necessary to accommodate site- or system-specific CAD system functions.

The pricing proposal provided herein includes the cost for USDD's XML CAD interface development and licensing for the USDD's interface to OSSI/ One Solution CAD. The CAD interface will be included software on the Communication Gateways. The pricing proposal also includes the cost of Central Square's side of the CAD interface as required by this RFP.

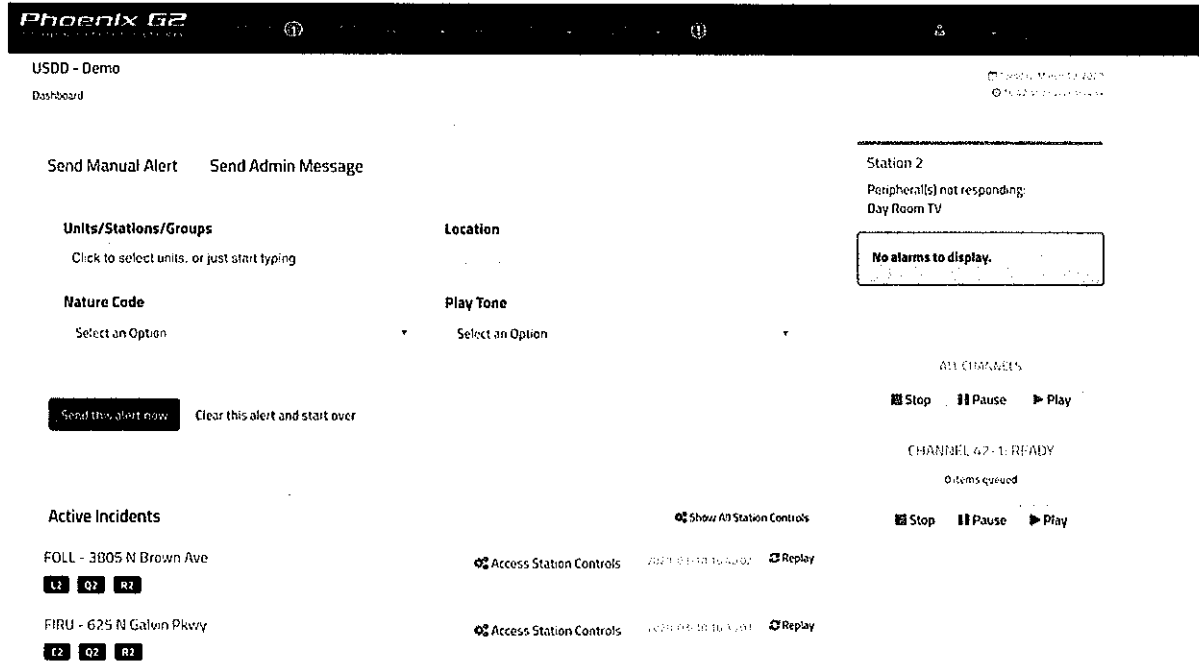
USDD's standard XML-based messaging API that allows the CAD system integrator full access to the alerting functions of the system. Alerts are generated by sending an XML Alert message to the Communications Gateway with the details of the alert including the groups, stations or units to alert. When the Gateway receives a message from the CAD system, it either acknowledges the successful receipt of the message, or rejects the message. This success or rejection is used to provide a reliable link between the CAD system and the Gateway.

The standard XML Alerting API gives complete control of what events on the CAD system can cause alerts, and US Digital Designs will provide assistance in configuring the XML messages for each of these types of alerts so they format VoiceAlert announcements, message sign text and printer output appropriately for each use case. In addition, XML Alerting API supports both emergency and non-emergency alerts. The Alerting API doesn't make a direct distinction between these types of alerts, but a customer can change the alerting behavior of the alerts using different alert parameters (such as turning on / not turning on lights, selecting alert tones, etc.). There are two alert message formats that can be used with the Communications Gateway to send alerts and one of the formats primarily supports emergency alerts and the other allows free-form messaging more appropriate for non-emergency alerts.

The Phoenix G2 Alerting System supports alerting by Station, Unit or Groups of Stations, Units or other Groups. The Communications Gateway also supports Aliases that can be mapped to other actual alerting entities to allow the CAD system to send different names than the names used by the alerting system. This can be used in cases where one station or units is to be alerted for more than one CAD identifier.

Web-Based Interaction

All interaction with the System is done through the web-based Dashboard and can be accessed by authorized personnel using any web-enabled device. Because the System is web-based, the System can accommodate as many dispatch positions as can be handled by the CAD System. This also allows HMS to use existing consoles for dispatching, provided the consoles are web-enabled with any current web browser. The Dashboard is the primary interface used for Manual Alerts, sending Administrative Messages, viewing Active incidents, managing VoiceAlert Radio Controls, and viewing System alarms.



Manual Alerting Client

In the event that the CAD system is unavailable for any reason, dispatchers can use the web-based Manual Alerting application provided with the Communications Gateway to alert stations without the CAD system. All status information normally provided to the CAD system is then provided directly to the dispatcher via the Manual Alerting application.

The Manual Alerting client also has an Administrative Announcement tab to allow authorized personnel to make non-emergency announcements (both free-form and canned/stock) to one or more stations using VoiceAlert, message displays and printers.

Because the Manual Alerting Client is web-based, no client software installation is necessary allowing any authorized user with access to a web browser to generate alerts.

Station Status & Control

The Dashboard application also organizes the status and control of each Station Controller. Using this dynamic web page, dispatchers are immediately aware of any Station Controller link failures, peripheral failures or input activations. The system can trigger alarms that are active while the trigger is active (like a Generator Run indication) or latching, requiring acknowledgement (like a station Fire Alarm). Each alarm can optionally trigger a single or repeating audible alert.

The operator can also override the operation of the station speakers and force the station to monitor the radio or turn the radio on for an extended voice announcement. Through configuration, inputs can be used to display and control bay doors, person doors, vehicle gates or other devices. The Station Status & Control page provides a dispatcher-friendly replacement for systems such as Motorola MOSCAD for station device control.

VoiceAlert

The Phoenix G2 VoiceAlert product provides the audible component of the fully-automated dispatch system. VoiceAlert reads the dispatch information in the customer's format using a clear, understandable male or female voice. These voices are generated by sampling real human voices, but provide full text-to-speech capabilities. The System currently has male and female Australian English voices available for VoiceAlert dispatches. Full text-to-speech allows the Alerting System to announce any information provided to the system: dispatches, weather warnings, or administrative announcements.

VoiceAlert is an option in the Station Controller for announcements in the response station, and an option for radio channel or talkgroup announcements and/or over our GS FSA smartphone App for iOS and Android. With VoiceAlert in the stations, multiple dispatches can be announcing different dispatches in different stations simultaneously, while VoiceAlert on the radio announces each dispatch sequentially. A radio channel announcement queuing feature can alter the dispatch announcement during periods of heavy activity to shorten the announcement length by, for example, not repeating the dispatch information.

VoiceAlert announcements can be reformatted based on incident type to, for example, place the units on the end of a structure fire dispatch to more quickly alert the dispatched stations to the location and nature of the incident. For example the normal VoiceAlert format might be "UNITS respond to a NATURE at LOCATION" and this might be rearranged to "NATURE at LOCATION for UNITS" to move the long list of units to the end of the dispatch. All of these formats are configurable by USDD for local operational requirements.

The USDD VoiceEditor application allows customers to modify the pronunciation of words that are not familiar to the VoiceAlert speech system. This is typically necessary where there are local pronunciations for street names. Other types of pronunciation adjustments can be made for unit types and street types and directions. A user-editable table is also used to convert CAD incident types into speakable forms.

To make an editing change, the user enters a word to adjust and can have the system speak the word. The user can then modify the pronunciation of individual parts of the pronunciation, add new phonemes to the pronunciation, split the word by syllables, and add emphasis to syllables. The system will speak the word after each pronunciation. The user can then save the modified word with the adjusted pronunciation and test the word with some sample text before moving to the next word.

Gateway Audio Radio Interface (GaRI)

The Communications Gateway pairs will be configured with a Gateway Audio Radio Interface (GaRI) to allow the System to transmit paging tones, alert tones and VoiceAlert announcements over the customer's radio channels or talkgroups without dispatcher intervention. The GaRI is a network device that receives streaming audio and control instructions from the Communications Gateway and outputs analog audio and control signals to detect radio channel busy signals, generate radio push-to-talk signals, and play the audio over the radio system. Each GaRI controls and outputs audio for two channels. Multiple GaRI's may be connected to the system providing control for multiple radio channels.



*G2 Gateway Radio Interface * Front Image * Back Image*

Radio channels connected to the system are independent and can announce different information across each channel, have independent VoiceAlert announcement queues with queue depth detection and announcement prioritization based on dispatch nature code or other CAD information. VoiceAlert announcements can also be modified by queue depth to reduce announcement length when multiple announcements are queued, allowing the queue to clear faster.

The integrated network switch allows the GaRI to be connected directly to two Gateway servers in a hot-standby configuration, or to other network devices as necessary. In special applications, the GaRI may be connected to a customer data network to allow it to be distantly located from the Gateway servers.

Audio outputs from the GaRI are 600-ohm impedance and DC-isolated for connection to most standard radio equipment. Each audio output channel has an analog audio output, a hardware channel busy input and a push-to-talk output. The Audio Output Channel 1 also has an adjustable sidetone output, which mimics the main output.

A System-selectable pass-through input may also be coupled to Output Channel 1 to provide switching between a customer-provided input source and the internal Channel 1 output for redundancy purposes. To ensure a failsafe operation, the pass-through input is coupled to Output Channel 1 when the TCP/IP connection to the GaRI is lost or when the GaRI is powered off.

The GaRI has two normally open auxiliary relay output and two auxiliary digital inputs that can be used internally by the system. The inputs are low-active with a provided ground reference.

The front panel has indicators showing activity on the two Audio Output Channels and the Auxiliary I/O. There is also a pass-through indicator that shows when the pass-through circuit is active.

Radio Console

In addition, the Communications Gateways can be configured with direct radio console control of Motorola MCC7500 consoles. The direct console interface allows the Gateways to select console resources such as channels or talkgroups, creating resource multi-selections and to send Call Alerts and ICALs. The console interface also provides integrated resource busy and Emergency Alarm / Call detection. *Note, this is not presently proposed or quoted for this Project.*

It should be noted, however, that the console interfaces can cause operations on the console that interfere with live dispatcher actions, such as selecting a different talkgroup from the currently selected one. This interference can disrupt dispatcher workflow if the dispatcher is not aware of the operation. For this reason, USDD strongly recommends against using the Radio Console Interface on a dispatch console used by a live dispatcher. This requires that the customer provide a dedicated console for use by the station alerting system. In some cases, such as a dedicated outbound dispatch-only position, shared use may be acceptable and this should be discussed with USDD to fully understand the application.

Station System

Each of the City's fire stations will be equipped with a Station-Level System to receive the automated alerts from the Communications Gateways, and having those alerts activate peripherals throughout a station to provide Responders with both audible and visual alerts. Each station will have at a minimum an ATX Station Controller and UPS, and peripherals as indicated in the station floor plans provided in the RFP and station designs provided with this Response.

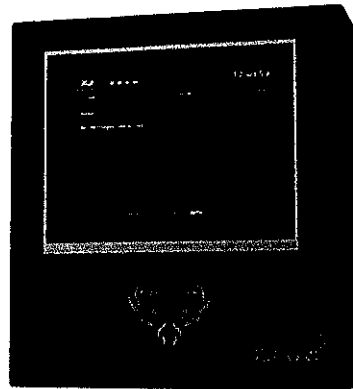
The station designs provide for new speakers. However, stations can also opt to use their existing PA system and speakers. An existing amplifier in a station can be connected to the ATX Station Controller and receive audio alerts. By repurposing the existing speakers and PA system, the existing wiring will be used, which will not provide station zoning. If a fire agency wishes to use existing PA Systems and speakers in its stations, it will need to determine if these are working properly and will perform the functionality required by the agency. USDD will assist in inspecting and testing each speaker and equipment for functionality and deficiencies. Note, however, that because of legal and liability issues, USDD cannot warrant or provide service for any third-party equipment provided by an agency (such as the PA System/Speakers).

The following is a description of the Station-Level System proposed for the City's fire stations:

ATX Station Controller

The Station Controller is the heart of the fire station side of the Phoenix G2 ATX alerting system. The Station Alerting Controller receives the alerting information from the Communications Gateway, as well as the voice announcement, if provided. The alerting information informs the Station Alerting Controller which units are to be alerted for the particular dispatch. The Station Controller then decides, based on its configuration, which areas of the station to alert and what information to display or speak for this alert. The Controller then activates all the peripherals necessary to complete the alert. This can involve any combination of Amplifiers, Message Remotes, and/or Room Remotes or printers. Additionally, the Controller can activate output relays attached to any of these peripherals in a momentary or latched mode, such as opening bay doors or turning on lighting.

*Station Controller * Power: 750W * Voltage: 47-63Hz/90-132 VAC/180-264 VAC (Selectable Switch) * Aluminum Anodized enclosure * Dimensions: 17.25" x 17.50" x 6.06" (WxHxL)*



Audio Inputs

The Phoenix G2 ATX provides the interface and control of audio sources in the fire station. The ATX has 3 audio connections for dispatch radios, dispatch audio phone lines and telephone intercoms. These audio inputs are switched to the audio output depending on their priority and the status of any active alerts. The input level of the audio inputs can also have different input levels depending on the alerted / not alerted state of the Station Controller allowing customers to have the level of monitored radio inputs reduced in volume when an alert is active and raised to a higher level for monitoring when an alert is not active.

Audio Outputs

The ATX Station Controller has x4 70 Volt audio outputs and 1 line- level audio output, each of which is independently zoneable. Initially, each station will have a total of 5 built-in zones. Additional audio zones can be added by adding Message Remotes or Room Remotes, or by switching audio outputs using IO Remotes.

The ATX Station Controller has a Speakers ON / Speakers Auto function to allow radio monitoring during the day (or when desired) and alert-only activation during night-time. If necessary, this feature can be overridden when desired on a station- by- station basis using the Station Status and Control web application in the dispatch center to force monitoring during

critical times. The On/Auto monitoring can also be automatically controlled by time of day or through other triggers using the station's IO Rules configuration.

The internal audio amplifiers in the Station Controller are remotely configurable for volume adjustment. Individual speakers are not remotely controllable (unless only a single speaker is connected to an amplifier). Volume can be digitally controlled through the Station Controller or through the web-based Remote Station Control Interface using any web-enabled device. Authorized users can set the time each mode is to start and end, and control speaker volume for each mode for indoor and outdoor speakers.

Test Alert

The Phoenix G2 Station Controller provides a Test Dispatch function in the Maintenance section of the application. This function creates a test dispatch for unit located in the station and activates the appropriate Message Remote and Room Remote units, as well as printing a test dispatch message on the attached printers.

Tones

The ATX Station Controller has standard ramping tones incorporated into the system. These tones are triggered by the receipt of an alert and the tone to play is contained in the alert message, allowing the CAD system to control the tone through the Communications Gateway. Tones are commonly selected based on the incident nature but can also be based on the units alerted or other CAD data. Additional tones can be added by USDD to meet individual customer requirements. Alert tones can be fixed or selected based on incident nature or other CAD data to meet operational requirements.

Sensing and Relay Controls

The ATX Station Controller has x4 Form C relay outputs and x3 internal DC contact closure inputs built into the ATX Station Controller (zoned relays). Additional I/O relays can easily be added to the System by using I/O's incorporated into several G2 peripherals. The ATX firmware includes a sophisticated but simple to configure IO Rule function to control these relay through various triggers including: any station alert, specific unit alert, time of day, closure of an auxiliary input and loss of communications link. Relays can be held closed as long as the trigger is active, until another trigger clears it, or for a specified period of time (pulse). Relays can also be configured for operation from the Dispatch Center through the Station Status and Control page for, as an example, controlling bay doors or parking area gates.

Zoning Capabilities

The System can be configured to incorporate zoning in stations so that portions of a station can be alerted without alerting the entire station. This can be easily accomplished through the internal audio amplifiers already included with the ATX Station Controller and by using station peripherals such as LED Speaker Light outputs, LED colored light indicators and Message Signs. Common areas are typically set to alert for all alerts and sleeping areas can be configured with fixed unit-associated zones or equipped with Room Remotes to allow unit associations to be

selected per room. Room Remotes can have 1 or more units assigned for selection and fire fighters can select which units they wish to have trigger alerts for that room. This selection is reset at the Day time set in the controller to prevent inadvertent loss of alerting after shift change.

The ATX Station Controller supports more than 200 zones in each station through the use of the built-in amplifiers and the addition of Message Remotes, Room Remotes, and IO Remotes. The ATX Station Controller has x4 70 Volt audio outputs and 1 line- level audio output, each of which is independently zone-able for a total of 5 built-in zones. Additional audio zones can be added by adding Message Remotes or Room Remotes, or by switching audio outputs using IO Remotes.

Each Message Remote has 2 audio amplifiers and can add 1 or 2 zones, and a Room Remote has 1 audio amplifier and adds 1 zone.

In the Station Controller individual Peripheral devices and audio amplifiers are associated with Station Areas (or zones). All devices in a Station Area are activated for an alert that involves that area.

Each Station Area is then associated with one or more units and is activated whenever an associated unit is alerted. Unit to Station Area association is configured using the web configuration in the Station Controller.

If configured, the front panel touch screen can also be used to select the units associated with a Station Area to allow firefighters to select unit associations for example when necessary to change dorm rooms.

Room Remotes have an integrated message display that can be used to change the unit to Station Area associations in the individual room where the Room Remote is located. This configuration is typically used in dorm rooms where staff from different units share the room on different shifts and the dorm room is assigned as a Station Area.

Printer Interface

The ATX Station Controller supports printing of incident dispatch information on standard PCL or PostScript printers. The printer text formatting is set by the Communications Gateway. The ATX supports multiple printers, and printers can be zoned by Station Area allowing printers to be assigned to one or more units in the station. Printouts can be made as one per station or one per alerted unit to give each unit a printout. Printers are monitored for connections and can be reported as up or down.

The printer output format is configurable by USDD using any information provided by the CAD system in the XML alerting message. The printer output does not need be identical to the VoiceAlert announcement or message sign text and can include additional information if provided by the CAD system.

The Station Controller simultaneously routes and plays audio, displays visual text information and prints to connected printers when an alert is received.

Backup Alerting

A doorbell input is also provided and will play a selectable doorbell tone throughout the station when activated. The ATX also has the ability to connect a telephone with a ring detector; if the ATX detects ringing on the line it can play a ringing tone through the system into the fire station and display a message on any message device. The ATX also qualified as a backup controller in the event that the Alerting Controller or primary signaling circuit (IP Network) is unavailable due to failure. An ATX operating in backup mode will alert the entire station by activating all peripherals (Amplifiers, Message Remotes, HDTV Remotes, Sign Remotes or Room Remotes) if ringing is detected on the telephone line. This feature provides a redundant alerting circuit as specified in NFPA 1221.

The Station Controller simultaneously routes and plays audio, displays visual text information and prints to connected printers when an alert is received.

Other Features

Lighting Control – Turn on high-voltage lighting systems using control relays.

Doorbells – Momentary switches can cause the Station Controller to play doorbell tones and display message sign messages on activation.

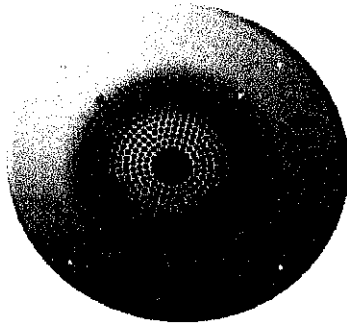
SIP VoIP Interface – The ATX Station Controller has an integrated SIP extension capability that can receive SIP messages and cause the ATX to answer a VoIP call directed to the extension. The Station Controller can also be configured to trigger actions based on the SIP call to, for example, trigger an All Station alert, or to play ringing over the station speakers. USDD intends to tie in the any existing VOIP system with the Station Controller to provide in-station paging. A contact closure and audio output from the phone in can be connected to the ATX Station Controller through one of the audio input and digital input, so that when a call is activated from, a contact closure is activated to the ATX and audio from the phone is fed to the audio input. The ATX activates the station speakers, and other peripherals to play the alert from the phone.

Uninterruptible Power Supply

The ATX Station Controller powers all the peripherals connected to it (except for the HDTV Remote) using power over Ethernet. The ATX uses the single CAT 5e or CAT 6 cable to provide the peripherals Ethernet data, audio and power. The benefit of this is that only a single LAN cable is required to connect an ATX Station Controller and any peripheral in the station. Therefore, peripherals do not require an external power source. To protect the power to the ATX Station Controller, USDD requires each Station Controller be connected to a UPS, notwithstanding if a station is connected to an auxiliary power generator. Accordingly, each station design will require a UPS.

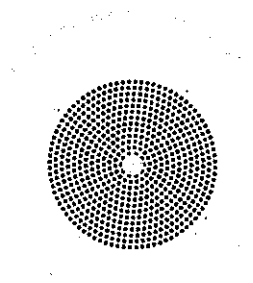
LED Speaker Lights, Indoor and Outdoor Speakers

Speaker lights provide low-voltage lighting for use when an alert is active. Each speaker is fitted with 16 high intensity red LED lights that offers exceptional luminosity without causing light blindness due to dark to bright transition. Speaker lights are typically used in dorm rooms and exit pathways from dorm rooms to the apparatus room. Speaker lights can also be used as alternative alerting devices in high-noise areas like gyms or day rooms.



*G2 LED Speaker Light*Type:
8 ohm or 70v configuration
Power: 48 VDC, 20mA90
dBspl sensitivityDimension:
9.5" Diameter

USDD provides architectural grade speakers that have been universally accepted by its customers in dispatch alerting as providing exceptional sound quality and providing clear audio. All indoor speakers, including the LED Speaker Light can be flush or wall mounted. Weatherproof speakers have been environmentally tested to ensure long-term operations in any weather. The specifications meet or exceed the Mil-Std810E Test Methods for Temperature, Humidity, Ultraviolet light and Salt Spray, and all components are housed in a weather-tight enclosure.



Indoor Speaker

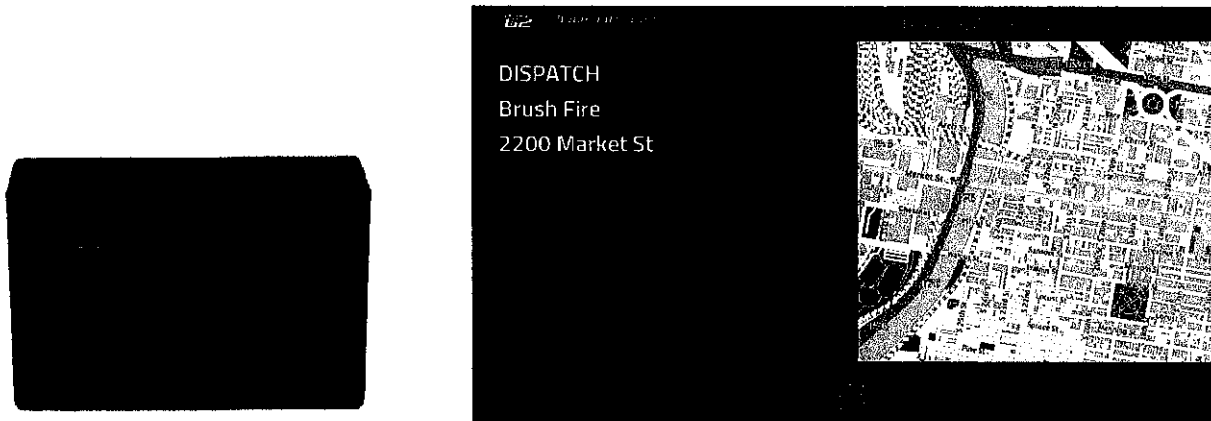


Outdoor Speaker

G2 HDTV Remote

The G2 HDTV Remote provides the functionality to turn any high-definition TV, screen, monitor or projector with a HDMI connection into a digital display monitor. The HDTV Remote connects the Station Controller with a HDTV display through an integrated HDMI output and is powered

from AC power local to the HDTV display. The HDTV Remote can display any dispatch information, incident location map and turnout timer simultaneously on the display. Provided the HDTV Display has Consumer Electronic Control (CEC), which is provided with most modern HDTV's, upon receipt of an alert, the HDTV Remote will automatically switch to the assigned HDMI input to display the incident information. After a configurable amount of time, the HDTV will automatically revert to the HDMI input prior to the alert, and resume the functions assigned to that HDMI port. Turnout timer functionality is included in the display of the HDTV Remote when used in conjunction with an ATX Station Controller. The HDTV Remote turnout timer counts up in seconds and changes color from green to yellow to red as the time approaches the NFPA 1710 standard turnout time.



*G2 HDTV Remote and Flat Panel Screen
(HDTV) powered by HDTV Remote*

G2 Message Remote 2

The new G2 Message Remote 2 replaces the legacy Message Remote and provides two independent 20w audio amplifiers with independent volume controls and also connects to two LED Message Signs to display dispatch units and information. Signs powered by the Message Remotes and do not require any other external power supply. The Message Remotes can be provided with a wall bracket for mounting two signs back-to-back for use in hallways or common dorm rooms. Message Remotes include power and control for LED Speaker Lights, and 2 auxiliary relay outputs and 2 auxiliary inputs

G2 Message Remote 2



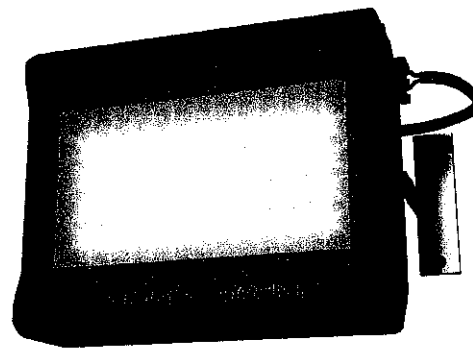
The purpose in this Project for the Message Remote 2's is to provide separate zoning for each bunk room in Station 1 and Station 5 as required under Question 9 of "Specifications Required." The ATX Stations Controller's front panel touch screen will be configured to enable personnel to select the units associated with a Station Area (zone) to allow firefighters to select unit associations for when necessary to change these bunk rooms.

Push Buttons

US Digital Designs offers manual push buttons for installation in stations. Push buttons can be used by station personnel to indicate either dispatch acknowledgement or apparatus response. The dispatch acknowledgement or apparatus response indication can then be passed on to the CAD system. The CAD systems typically display these events as messages for the dispatcher. For this Project, a Push Button is provided for use as an emergency alert at the front door of a station and as a dispatch acknowledgment at the entrance of the App Bay.

Strobes

Strobe Lights are an attention-getting flashing light unit that is typically used in high noise areas to provide visual alerting without adding to high noise levels in the



Optional Peripherals

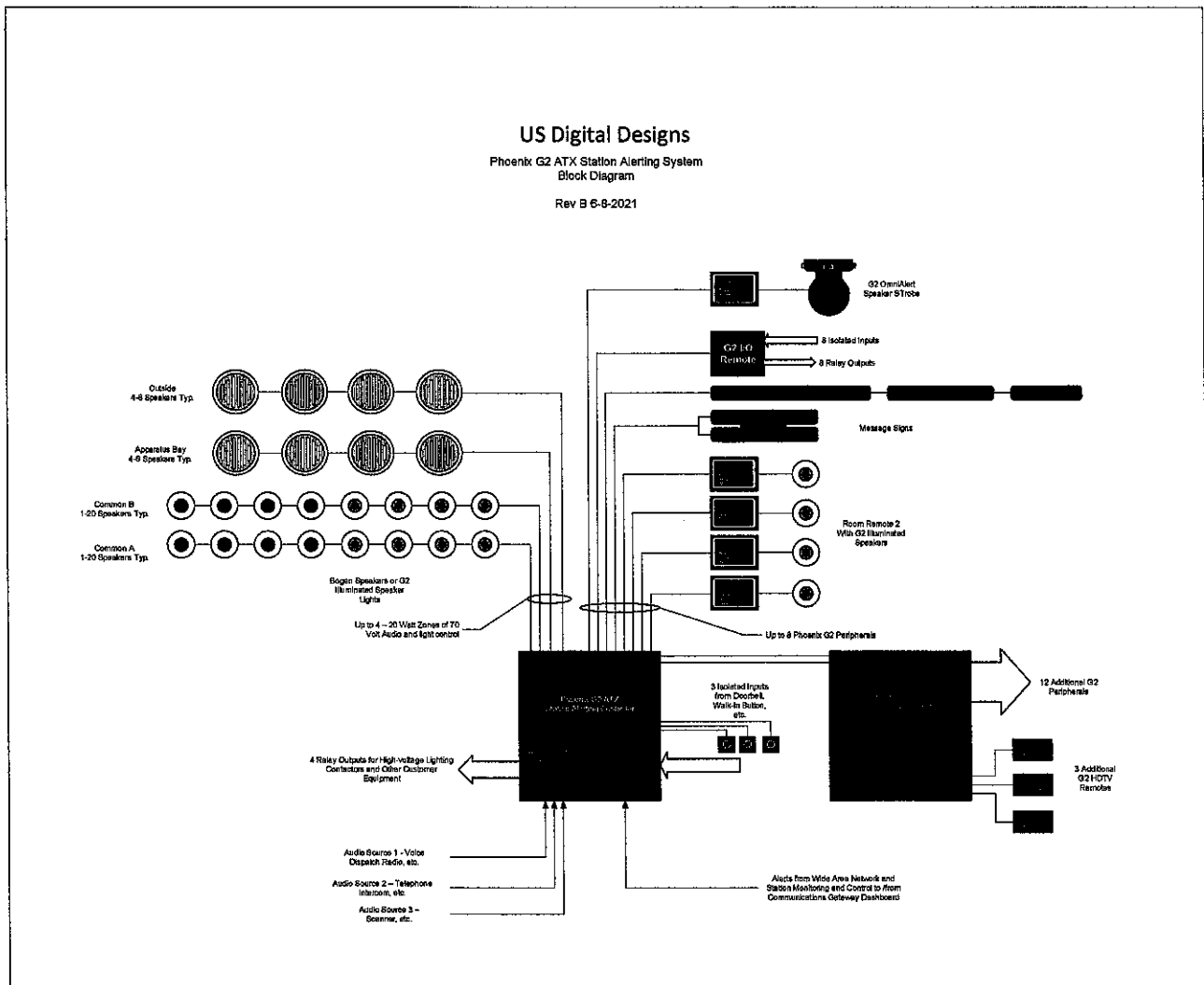
In addition to the components described above, USDD provides various peripherals designed to transmit the alerts audibly and visually throughout a fire station, with visual alerts reinforcing the audio alert and providing Responders with greater situational awareness. The System has been designed to be modular, allowing for the addition of Communication Gateways, Station Controller and peripherals at any time with only configuration changes required. This allows an agency to build on the System as the agency expands or are budgets allow.

The ATX Station Controller has 8 POE ports for these devices, as well as Color Unit Indicators (3 per POE port) and IO Remotes. Additional devices can be added to the system through the addition of Expansion Cabinets that add 12 additional ports per Cabinet. Multiple cabinets can be added to the system. The largest system delivered to date has more than 75 devices in one station. Also, 1 message sign can be powered and controlled directly from the ATX Station Controller.

US Digital Designs

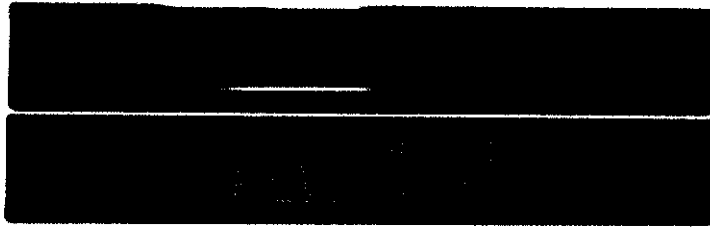
Phoenix G2 ATX Station Alerting System
Block Diagram

Rev B 6-8-2021



G2 LED Message Signs

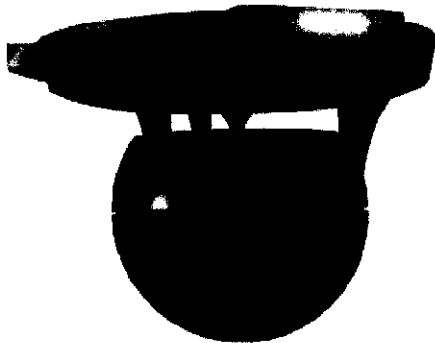
The G2 LED Gamma Message Sign signs provide a single line message, either scrolling or static, depending upon the length of the message. The Gamma Sign is designed to be powered directly by the ATX Station Controller, and up to three Gamma signs can be included in one string. It comes in three screen sizes, a 12" active screen which can only be tasked to be used as a turnout timer; a 24" active screen width, often installed in common areas, hallways or in App Bays in a stacked configuration with one sign displaying the alert, and the other sign used as a turn out timer; and 36" active screen width. The 36" screen Gamma can also be configured so a portion is dedicated as a turnout timer. This allows the 36" Gamma sign to provide the dual functionality of providing the dispatch information and turnout timer in a single screen.



The information displayed on these message displays is configurable by USDD from the information sent from the CAD system in the XML alerting message. Information typically displayed includes the units assigned to the incident from a station, incident type and location and response channel. Some agencies also include cross streets, ProQA response code, map page and city name or code. The displays can include any information received from CAD, although feedback from customers indicates that operations management prefer shorter messages to limit the time spent reading the message during the turnout time.

G2 OmniAlert Strobe Speakers

The OmniAlert Strobe Speaker is a dual purpose, visual and audible fire station alerting device. The speaker is optimized for the spoken word. It broadcasts high-powered and clear voice announcements, and leverages 360-degree horizontal dispersion, allowing for greater coverage and installation flexibility. It also includes three built-in, high-intensity LED strobe lights that simultaneously provides rotating bursts of light to visually alert personnel, even if the local ambient noise conditions prohibit audible alerts.



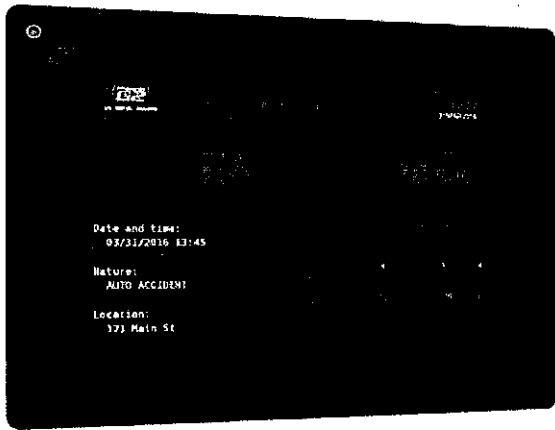
*G2 OmniAlert Strobe Speaker:
13" high x 15" diameter
70v Speaker Input
48 vdc Strobe Light Input
Power Consumption: 52 (strobe light)*

The OmniAlert Strobe requires either an ATX Station Controller 70v Amplifier Channel and Speaker Light Output, or a Message Remote 2 Amplifier (see description below) and Speaker Light Output

G2 Room Remote 2

Room Remotes provide similar features of a Message Remote in a smaller package with a message display integrated into the unit. The Room Remote can provide 15-watts of power to speakers and provides a contact closure on activation to turn on overhead lights. The Room Remote has a switched output to provide power for LED Speaker Lights and tone auxiliary relay

output and one auxiliary input. The new generation G2 Room Remote 2 (now currently available) provides a 10.1" full color, high resolution LCD touch screen display, which allows the display to show dispatched units, incident information text and a turnout timer.



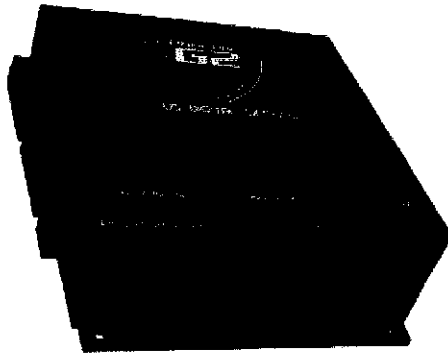
G2 Room Remote 2.

G2 I/O Remote

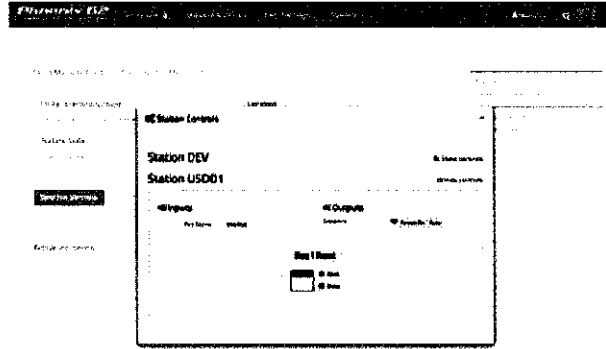
The ATX Station Controller has x4 Form C relay outputs and x3 internal DC contact closure inputs built into it, which can be used to control gas shut off valves, the push buttons, and other station functions. In addition to the Station Controller, several G2 peripherals that have I/O's incorporated in them, including:

LED Message Sign – Gamma (24" and 36")	1 input / 1 output relays
Message Remote	2 input / 2 output relays
Room Remote 2	1 input / 1 output relays
G2 Color Indicator Remote	1 input / 1 output relays

If additional I/O's are needed, these can easily be added to the System through the G2 IO Remote. The IO Remote has 8 relay outputs and 8 relay isolated inputs that can be controlled by IO Rules in the Station Controller or by the Station Status and Control page on the Communications Gateway. Outputs can be connected to overhead door or vehicle gate controls, access control systems and other devices. Inputs can indicate the status of doors, fire alarms, generator run status or other similar devices. The Station Status and Control page on the Communications Gateway can be configured to display alarms to dispatchers when an input is activated and play an alert tone until acknowledged by an operator.



I/O Remote



Screenshot of Communications Gateway Dashboard showing configuration of inputs, outputs and bay doors in station.

Distributed I/O Setup					
I/O Rules					
Front Door	Aux Input	Dorm 2 [Input 2]	Causes	Plays Tone "Doorbell: Four Chimes Down" With Text "Front Door"	Edit Remove
Clear Alerts App	Aux Input	Apparatus Bay [Input 1]	Causes	Clears Active Alerts	Edit Remove
Bay	Aux Input	Day Room [Input 1]	Causes	Plays Tone "Doorbell: One Chime" Looping With Text And Speech "Back Door"	Edit Remove
Back Door	Aux Input	Dorm 2 [Input 1]	Causes	Triggers Station-Wide Alert "Walk In", Tone 22 Always	Edit Remove
Walk In	Aux Input	Dorm 2 [Input 1]	Causes	On Device: Day Room [Output: 1]	Edit Remove
Stove	All Station Alerts		Opens Output Indefinitely	On Device: Day Room [Output: 1]	Edit Remove
Stove ON	Aux Input	Day Room [Input 2]	Closes Output Indefinitely		Edit Remove
Communications Link DOWN	Communications Link Down		Causes	Plays Tone "Doorbell: One Chime" With Text And Speech "Link Down"	Edit Remove
Baby Drop Off	Aux Input	IO Remote 1 [Input 2]	Causes	Plays Tone "Proximity Warning" With Text And Speech "Safe Haven Alert" Then 10s Delay	Edit Remove
			Closes Output While Input		Edit Remove
Test rule	SIP Call Received	On Extension	Active	On Device: IO Remote 1 [Output: 4]	Edit Remove
test rule 2	SIP Call Received	On Extension	Causes	Plays Tone "Doorbell: One Chime" With Text "Info" Then 30s Delay	Edit Remove
		ATX			Edit Remove
Backup Alert	Aux Input	Mainboard [Input 1]	Causes	Triggers Station-Wide Alert "Backup Alert", Tone 2 Always	Edit Remove
Fire Alarm	Aux Input	IO Remote 1 [Input 3]	Causes	Plays Tone "Proximity Warning" Looping With Text "Fire Alarm"	Edit Remove

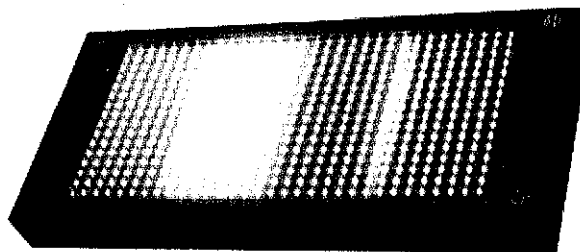
Editing Rule 'Front Door'	
Enter Rule Name:	Front Door
Input Type:	Aux input
Choose a device:	Dorm 2
Input:	2
Normally Closed:	<input type="checkbox"/>
Output Type:	Play tone with text
Text:	Front Door
Tone:	Doorbell: Four Chimes Down
Speak Text (only if local speech available):	<input type="checkbox"/>
Loop Tone While Input Active:	<input type="checkbox"/>
Post-Tone Delay (default 5): (seconds)	
<input type="button" value="Save Changes"/> <input type="button" value="Cancel"/>	

Screenshots from G2 Station Controller Interface showing advance configuration of inputs, outputs, devices and customized triggers, and editing screen.

G2 Color Indicator Remote

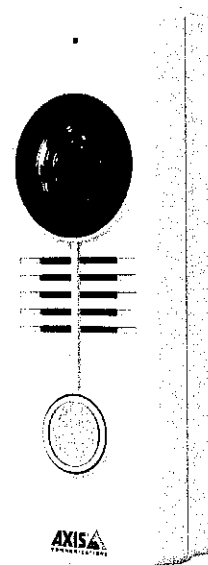
The Color Indicator Remote offers an alternative alerting method, featuring high-intensity LED lights. The CI Remote can be configured through the Station Controller to display colors for various system events including Station and Unit alerts, Doorbell and other input activations, and system status changes.

Color Indicator Remote



G2 Video Door Station

Network Video Door Station is a Doorbell, Camera, and Communication Device that can tie directly into the G2 FSA System at each station. The Video Door Station Interfaces to a HDTV Remote(s) inside same (station-level) G2 Fire Station Alerting System. (includes local power injector)



Value Added Features / Functions

Remote / Redundant Alerting

USDD has developed the Phoenix G2 FSA Mobile Application (the "App") to provide the capability to alert authorized personnel using a mobile application that interfaces with the CAD system. The App is supported by Apple and Android devices. The App will interface with the CAD system to send simultaneous mobile alerts, including dispatch announcements, administrative alerts, IT support notifications and application update notifications to authorized personnel via their smartphones and tablets. The App alerts personnel as individuals or groups (e.g., stations, battalions, districts, etc.) wherever they are, making it especially ideal for volunteers and reserves. The mobile alerts plays the same tones as those in the station, shows incident location using the device's built-in mapping capabilities. The App also provides a link to enable turn by turn directions to the incident location using the mobile devices mapping capabilities. Users are able to save notifications for future reference and search for previous notifications. In addition, the App provides an easy-access email address and phone link to local IT support. Each ATX Station Controller purchased and used within the System will enable x24 App licenses at no additional charge while the System is under warranty or annual service and support. Additional licenses can be obtained on a sliding cost scale. It should be noted, however, that the performance of mobile alerting is subject to network reliability and coverage.



The System also supports remote alerting capabilities by generating an alert that can send an email to server via SMTP or ESMTP. Upon receipt of an alert from the CAD, the Communications Gateway will generate an alert and can send an email to server via SMTP or ESMTP. This email can be directed to a paging or cell phone system to deliver pages or SMS messages. Messages can be sent when specific Groups, Stations or Units are alerted, or when configured key words are found in the dispatch message. Event messages are delivered when the event occurs and when the event clears. Again, it should be noted that the performance of the remote alerting is subject to network reliability and coverage.

Mapping Capabilities

Basic mapping using data from CAD system is included at no additional costs. USDD provides an optional hosted map display feature that can display an incident map using HDTV Remotes in the fire station. When an alert is received by the Communications Gateway from the CAD system, the Gateway will query the Mapping Server for a map of the incident location. The Gateway will then provide this map to any Station Controllers alerted for this dispatch and HDTV Remotes in the station will display the map. The mapping server is hosted and maintained by USDD on an Amazon EC2 virtual machine. If the customer selects this option the CAD system must support sending Latitude and Longitude for alerts and the customer's Communications Gateways must be able to contact the USDD Mapping Server on the Internet. Customers can provide mapping data to USDD in standard format for loading on the server and later display on the maps.

Customers can also opt to host its own mapping server. USDD can provide a mapping server to the customer and assist the customer in configuring and modifying the server to provide customer's information only for an additional cost.

Software

The Phoenix G2 System is a special-purpose appliance system, with the components specifically configured with hardware and software for station alerting. US Digital Designs will provide standard embedded software for the operation of the station alerting system. This includes the software for the operation of the central Communications Gateway and GaRI radio system interfaces.

Included in the imbedded software will be USDD's standard interfaces to Customer's CAD system and radio system, and includes the following:

- USDD's standard interface to the Central CAD system. The interface will consist of USDD's standard XML API. The interface allows the CAD system integrator full access to the alerting functions of the System and will generate an alert by sending an XML Alert Message to the Communications Gateways with the details of the alert. When the Gateway receives a message from the CAD system, it either acknowledges the successful receipt of the message, or rejects the message. This success or rejection is used to provide a reliable link between the CAD system and the Gateway. The costs associated with CAD Vendor's interface fees are not included. CAD Provider's portion of the FSA interface is the responsibility of the customer.
- USDD's radio interface to customer's radio console. The following is a description of the interface used for the MCC7500 console: The USDD to MCC7500 API Application is a Windows application that must run on a dedicated MCC7500 radio console, where it uses the MCC7500 API DLLs and uses the MCC7500 features as a Dispatch User Interface (DUI) program. The Interface application exposes a subset of the console features that

USDD has deemed necessary or desirable to support fire alerting and dispatching operations. The MCC7500 features exposed by USDD's interface are:

- Call Alerts
- Resource Select / Multi Select
- Emergency Call Status (asynchronous notify)
- Inbound Radio Message (asynchronous notify)
- Inbound PTT ID Status (asynchronous notify)
- Resource Busy (asynchronous notify for only resources in a Multi-select Group)
-

The Interface also, whenever possible, hides the complexity of the MCC7500 API from the network client by exposing "feature-level" request/response messages on the network that the Interface turns into multiple API function calls and messages.

More information concerning the Console Radio Interface will be provided upon implementation.

Also included will be the software to enable:

- VoiceAlert – the audible component that provides full text-to-speech capabilities and allows the System to announce any information provided to the System.
- VoiceEditor – which allows the customer to modify the pronunciation of words that are not familiar to the VoiceAlert system.
- Manual Alerting Client – in the event the CAD system is unavailable for any reason, dispatchers can use the web-based Manual Alerting application provided with the Communications Gateway to alert via the Radio alert path or Station alert path without the CAD system. All status information normally provided to the CAD system is then provided directly to the dispatcher via the Manual Alerting application.
- "Look and Feel" module to adapt the Station Alerting System to the requirements of the customer. This is a software module that is customized to meet these needs and includes the mapping of all CAD data fields to internal system data elements, the format of location information received from the CAD system, the VoiceAlert announcement formats for both in-station and on-radio announcements, and Message Display formatting.

Although the system is capable of per-channel control of VoiceAlert announcements, some customization is expected for the user interface to allow dispatchers to control the VoiceAlert radio functions of the system on a per dispatcher basis.