



ASTRO 25 DATA SOLUTIONS

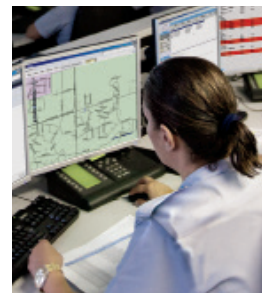
DATA SOLUTIONS THAT LEVERAGE YOUR MISSION CRITICAL INVESTMENT



Make a powerful resource even more powerful by adding data applications that allow you to deliver critical information to your personnel and enable them to make informed decisions anywhere, anytime.

ASTRO® 25 data solutions supplement voice communications, reduce costs and empower users with new ways to access and share information. With better information, your personnel can make better decisions and ultimately achieve better outcomes for their agency and the communities they serve.

- Send text messages to users who need to communicate silently or obtain detailed information they would otherwise have to write down
- Track the outdoor location of radio users and vehicles so dispatchers can deploy nearby units for faster emergency response
- Reduce the time and costs associated with programming radios
- Access departmental records from any location so that users can get the information they need, when and where they need it most
- Send emails and attachments among dispatchers, commanders and front-line personnel
- File “paperwork” from the field with an HPD system, allowing personnel to spend less time at their desks and more time on the streets



Motorola understands the importance that data plays in today's mission critical communications and is committed to narrowband data systems with over 300 ASTRO 25 Integrated Voice and Data (IV&D), Enhanced Data or HPD systems.

ADD DATA TO MISSION CRITICAL VOICE

The ASTRO 25 platform supports three data solutions: ASTRO 25 Integrated Data, Enhanced Data and HPD. You can begin with voice and quickly add data starting with Integrated Data and, then, add the operationally efficient Enhanced Data for a practical location service solution or HPD dedicated data when faster data speeds to support more data-intensive applications are needed. Integrated Data, Enhanced Data and HPD solutions share the same core equipment, site locations, backhaul and personnel to manage and maintain the system. Flexible designs mean that Enhanced Data can be added to Integrated Data through a software upgrade, an ASTRO 25 system can be installed and then an HPD overlay added, or the ASTRO 25 HPD system can be installed first and Project 25 voice and data capability added later.

ASTRO 25 INTEGRATED DATA

Integrated Data is a cost effective way to simplify administrative tasks and put more applications, beyond voice communications, into the hands of radio users. With an existing ASTRO 25 voice system, adding integrated data is simple and can provide a host of additional high-value applications including GPS location, fire station alerting, text messaging, database queries, dispatch notifications and BOLOs.

Integrated Data works with data-enabled Motorola P25 two-way radios and enables users to share data such as text messages with each other. There is no need to purchase specialized end-user equipment.

Integrated Data coexists with voice traffic over the same radio frequencies you're already using. The system

dynamically reallocates channels to voice or data in real time as user demand requires, maximizing your use of available channels. Integrated Data always gives priority to voice over data, so that data transmissions will not interfere with voice calls. In times of emergency, a site's data resources are reallocated if the demand for voice becomes exceptional, providing extra voice capacity when it becomes essential.

ASTRO 25 provides an option to add encryption to Integrated Data, providing the same security level as voice systems. ASTRO 25 also offers the Intersystem Data option which allows users to roam to an adjacent ASTRO 25 IV&D system and still enable data, such as GPS location, to be received by their home system.



ASTRO 25 ENHANCED DATA

Enhanced Data is optimized to handle different message sizes and variable update rates from different applications. Multiple agencies can benefit from the ability to share ASTRO 25 core and RF site infrastructure with an existing ASTRO 25 system, resulting in lower overall cost. Add Enhanced Data to your Integrated Data system with a software installation and improve data channel efficiency and enable denser network traffic such as that created by:

- **GPS Location** – Personnel who are out of their vehicle, operating in large office complexes or assigned to alternate modes of transportation including; bicycles, ATVs, horseback and boats have traditionally went without the benefits of GPS tracking due to the extra equipment needed and network limitations. Enhanced Data allows you to track large numbers of Motorola GPS equipped portable and mobile two-way radios. Automatic Vehicle Location (AVL) and GeoFence applications enable hands free talkgroup selection and notify personnel with text messages as they enter and exit designated areas and zones.
- **Telemetry** – Keep track of your fleet and personnel with telemetry updates to ensure safety, health and maintenance. With monitoring of vehicle speed, crash notifications, maintenance needs and environmental conditions, as well as personal biometrics including heart rate and blood pressure, you can manage remote assets and have a clearer operational picture.

Enhanced Data automatically balances channel utilization for voice and data traffic if the demand for voice becomes exceptional, providing extra voice capacity when it becomes essential.



ASTRO 25 HPD

HPD introduces higher bandwidth to support a portfolio of mobile data applications that run on vehicle-mounted computers. HPD uses dedicated channels for data applications to provide maximum data capacity without compromising your voice system. With HPD and the right applications, users in the field can directly access databases, including warrants, arrest records and DMV records. They can also capture fingerprints, access an intranet database and match the prints using a mobile ID application.

APPLICATION SUPPORT

ARCHITECTURE	ASTRO 25 INTEGRATED VOICE AND DATA	ASTRO 25 ENHANCED DATA	ASTRO 25 HPD
CHANNEL SIZE	12.5 kHz	12.5 kHz	25 kHz
FREQUENCY BANDS	VHF/UHF/700/800/900 MHz	VHF/UHF/700/800/900 MHz	700/800MHz
APPLICATIONS	• BOLOs • Dispatch Notifications • Dispatch Queries • Encryption and Over-the-Air Rekeying • Fire Station Alerting • Outdoor Location Tracking* • POP25 Over-the-Air Radio Programming • Text Messaging • Vehicle Sensor and Telemetry* • Third party Application Program Interface (API) and Outdoor Location*	• Outdoor Location Tracking • Vehicle Sensor and Telemetry • Third party Application Program Interface (API)	• Location Tracking • Messaging • PremierOne™ CSR • PremierOne™ Mobile • Third-party Application Program Interface (API): - Web based browsing – internet/extranet - Photos, maps, still images - Fingerprints and mug shots - Field reporting, vehicle location, CAD dispatch - Filing administrative reports from the field

*ASTRO 25 Enhanced Data is preferred and recommended for these applications.

ASTRO 25 ADVANCED MESSAGING SOLUTION

Today's agencies want to leverage their ASTRO 25 system for more than just voice communications. With the ASTRO 25 Advanced Messaging Solution your organization can do everything from simple text messaging between radios and non radio users to queries of remote data bases. Silent, reliable and an efficient use of system resources, messaging is an ideal form of alternative communication when sensitive information is being shared/ accessed or when the environment is too noisy for conversations.

COMPREHENSIVE PLATFORM

Easily exchange information across your entire operation and with your external partners, including mobile and portable radios, smart phones, PDAs, mobile data computers, desktop clients and Computer Aided Dispatch (CAD). ASTRO 25 Advanced Messaging Solution is IP-based and connects via SMTP protocol to other messaging systems such as Microsoft® Exchange Server. This flexibility allows work partners across the government enterprise to communicate quickly and efficiently unifying your communication systems via messaging.

For ASTRO 25 customers with APX portable radios outside North America, Advanced Messaging Solution supports single and double byte UNICODE character sets in text messages for Hebrew, Cyrillic and Chinese.

CRITICAL FUNCTIONALITY

Designed and optimized for Motorola data-enabled radios such as the APX family of radios operating on an ASTRO 25 Voice and Integrated data system, the Advanced Messaging solution provides quick access to real-time information when responders are outside of their vehicles.

- Send robust free form or pre-programmed text messaging: peer to peer, radio to dispatch, radio to groups, dispatch to radio or dispatch to groups.
- Query databases for information such as: license plate, person, property and gun check, to provide timely information to the field such as hot hits, wants and warrants. Queries can be initiated and received on ASTRO 25 data-enabled radios, Smart Clients, PremierOne CAD and PremierOne™ mobile.
- Increase operational efficiencies and automatically receive dispatch information, BOLO's (Be OnThe Lookout) and remotely update status.

DESIGNED FOR FIELD USE

In a mission critical environment, first responders have special requirements that have been taken into consideration when designing the Advanced Messaging solution such as:

- Audible and visual alerts to notify users when information arrives
- Content adapted for portable radio capabilities including intuitive and easy-to-use interface
- Up to 150 pre-definable messages for quick and easy responses
- Large radio keypad to make it easy to compose free-form text messages of up to 200 characters
- Pre-defined address lists or user ID entry to simplify message creation



Text Messaging
APX radio with a text message request

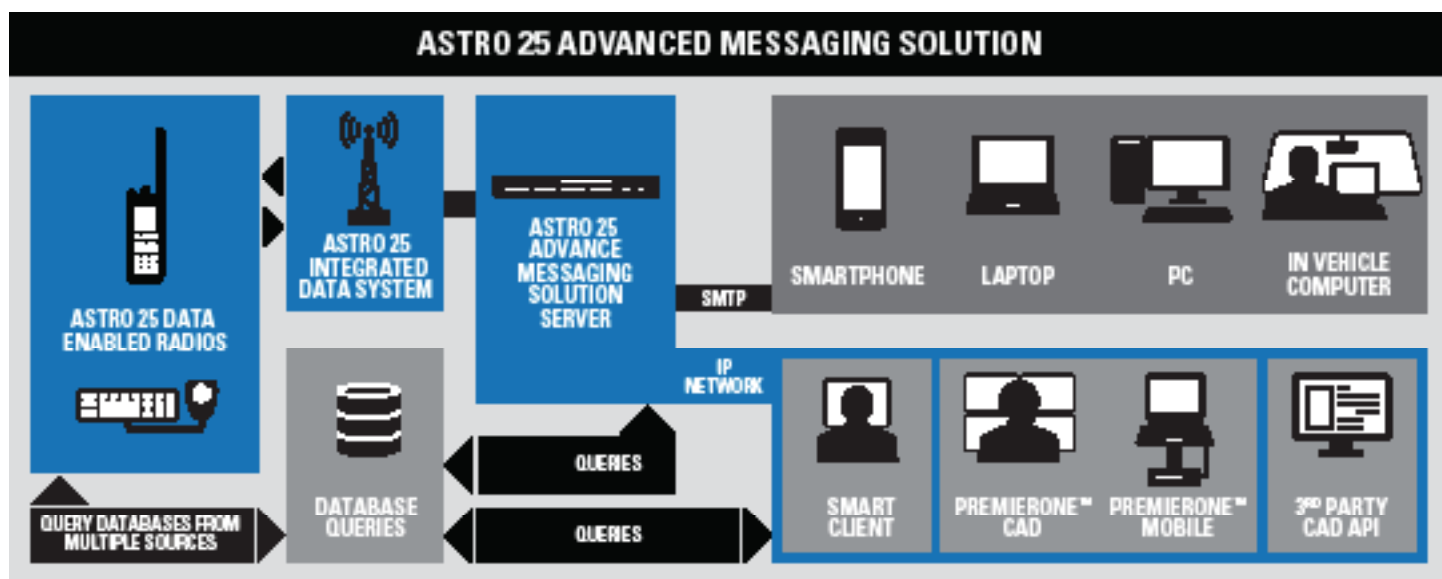


CJIS COMPLIANT QUERIES

To meet your information assurance (IA) needs, we offer CJIS-compliant query options based on RSA® multi-factor authentication technologies. With approved access to secure databases and protection of query results, users can quickly access the confidential information they need to make better on-the-spot decisions.

PREMIERONE INTEGRATION

When you deploy ASTRO 25 Advanced Messaging Solution with PremierOne™ CAD you get the best of both systems. Functionality is extended as dispatchers can send the most relevant information to field users such as incident dispatches, incident updates and BOLOs alerts on ASTRO 25 portable radios. From the field, users can update their status, run queries and send messages. While you will achieve maximum functionality using a PremierOne system, a legacy CAD system supplier can implement an interface through our published API to gain a subset of data interaction with your ASTRO 25 radios.



ASTRO 25 OUTDOOR LOCATION

Knowing the location of your personnel is essential for deploying them effectively and keeping them safe. The ASTRO 25 Outdoor Location Solution provides location data in real time with pinpoint accuracy. It works with Global Positioning System (GPS) devices connected to ASTRO 25 mobile and portable radios. Several update methods keep dispatchers informed of the radios' current locations:

- During day-to-day operations, automatic location updates are sent periodically or by distance traveled. Customizable settings allow the dispatcher to change the reporting rate or distance of any user to reflect the current situation, fine tuning the system so that dispatchers have current information without tying up valuable system bandwidth with unnecessary reports. For example, fire trucks parked at the station won't send location updates until they move out on a call.
- Dispatchers can manually update the location of any unit at any time, confirming the presence and position of field personnel without requiring voice call-ins, thus saving time and reducing radio congestion.
- For end users, information about the current location (latitude, longitude, time and date) appears on the radio display or in a third party mapping application on a mobile data terminal. An API connects GPS data to customer third party applications.
- Location data can be accessed from different applications, allowing departments to share hardware while insuring protected access to location information.



RADIO AND SYSTEM ADMINISTRATION

Keep your radios on the job, not in the shop. Relieve your logistics burden, reduce administrative costs and allow your systems to respond more quickly to changing conditions by automating both routine and emergency updates to your end-user equipment.

PROGRAMMING OVER PROJECT 25 (POP25)

POP25 automates the process, sending updates quickly and transparently over the air using the ASTRO 25 Integrated Data system instead of requiring users to bring their radios in for manual reprogramming. In addition to minimizing administrative costs and logistics issues, POP25 allows you to respond faster to changing conditions.

POP25 can quickly download changes to each user over the air. Voice operations takes priority when POP25 is updating a radio. During the times that the radio is making or receiving a voice call, the POP25 process is suspended and continues when the voice activity is complete. Users are notified when a new POP25 transaction is ready to be sent to the radio.

POP25 handles the same configuration parameters that can be programmed manually, including:

- Radio ID
- Talkgroups
- Mode names
- Scanning features
- Call lists
- Conventional channels
- Operating settings (menus, buttons etc.)

Built-in security mechanisms such as encryption prevent unauthorized users from programming and eavesdropping. Administrators can store pre-planned configurations, simultaneously queue multiple radios, track the state of each radio in the system and download information at schedule updates. For larger systems, multiple administrations can work in parallel to hasten the programming process.

APX RADIO MANAGEMENT

Managing your radio fleet is an important part of day-to-day operations. But it can also be expensive and time consuming. Updates to add or remove channels, upgrade firmware, or add purchased features through FLASHport upgrade, take substantial time and resources because each radio has to be programmed individually. Motorola's Customer Programming Software Radio Management application simplifies APX™ radio configuration and management, saving you time and money while ensuring your users can accomplish their mission without interruption.

ACCESS AND SHARE CODEPLUGS

Changes to codeplug templates can be automatically applied to all affected radios remotely from the radio codeplug database while radio programming jobs can be scheduled ahead of time giving you more flexibility and operational efficiency.

RADIO MANAGEMENT ADVANTAGES

- Efficient radio inventory management
- Centralized radio configuration and codeplug management
- Automated radio updates of both codeplugs and software flash versions
- Remote over the air programming via the P25 radio system
- Batch programming via USB configuration (up to 16 radios at one time)
- No missed calls with Over-the-Air Programming due to voice priority with Motorola's ASTRO 25 systems

OVER-THE-AIR REKEYING (OTAR)

Digital encryption helps to keep your communications secure. OTAR is enabled via Motorola's FIPS 140-2 certified Key Management Facility and allows system operators to easily and securely change encryption keys on a regular basis, making the keys a moving target and more difficult for adversaries to crack. If one of the radios is compromised you have the ability to:

- Remote inhibit – Securely prevent radios from gaining access to the network from a distance
- Remote enable – Securely re-establish a radio's network access from a distance
- Zeroize – Securely remove a radio's key material
- Change-over – Securely switch a radio's keyset to another keyset for use

OTAR, like POP25, sends updates to radios over the air, so users do not have to bring their radios in for manual service. That's especially important for encryption keys because a manual changeout could take days or weeks to accomplish – meaning lost money and productivity as well as a longer window of vulnerability.

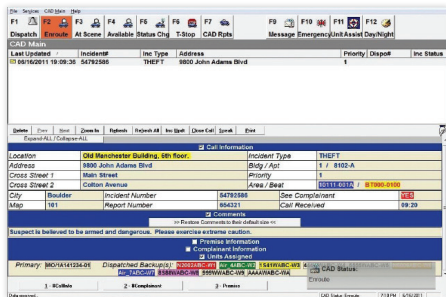


MOBILE DATA

Mapping applications can receive GPS coordinates from the ASTRO 25 Outdoor location solution.

PREMIER MDC MAPPING

Utilizing the ASTRO 25 HPD system, Premier MDC gives field personnel access to real-time data from Computer Aided Dispatch (CAD), Records Management Systems (RMS) and other public safety and service applications, including local, state and federal databases.



Premier MDC gives first-responders access to mission critical information in the field

- Enhance officer safety with access to real-time, accurate data regarding people, places and property
- Improve firefighter and EMS safety through the availability of information about hazardous materials and preplanned responses
- Save time, improve productivity and increase community presence by limiting travel time to the office for information
- Receive silent dispatch and communication via a computer aided dispatch (CAD) system or anyone connected to the same Premier MDC system
- Conduct license plate queries to provide additional information about a situation before stepping out of the vehicle
- Query the latest information about a subject's driver license status, warrants and more
- Streamline officer requests and the ability to communicate with others by reducing radio traffic

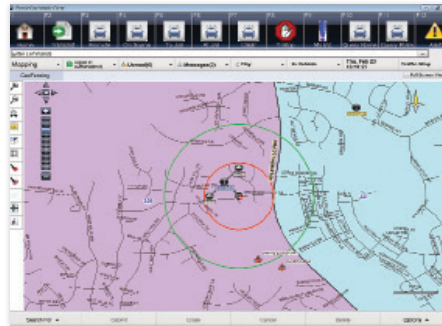
PREMIERONE™ RESPONDER LOCATION

Knowing the precise location of your responders when outdoors is not only essential for their safety but also for the safety of your community. Integrating Motorola's GPS enabled radios operating on an ASTRO 25 voice and

integrated data system with our GIS-based PremierOne™ Computer Aided Dispatch and Mobile applications gives you greater visibility to your entire operation. Supervisors and dispatchers can see an improved real-time view of resources for increased situational awareness and better dispatch decisions. When responders need help, you know exactly where to send back-up.

INTEGRATED PLATFORM

Share real-time location information from the field for robust incident and unit management as you leverage the combination of your ASTRO 25 Voice and integrated Data System, ASTRO 25 data-enabled GPS equipped radios and PremierOne platform.



Responder Location Map

- Locate all personnel not just those in vehicles
- Integrate mapping with PremierOne to view responder location along with incident on a single map
- Configure map icons to provide location and resource details such as Vehicle In or Out, Agency, Incident Type, Unit ID, Name
- Control location position updates based on unit status, incident type, incident priority, distance traveled to utilize network resources more effectively
- Override pre-configured GPS reporting intervals when the emergency button is activated
- Request location On-Demand by dispatcher
- Monitor the deployment of resources on PremierOne maps in the dispatch center and also in the field using mobile mapping

DISPATCH AND COMMAND SOLUTIONS

Give your dispatchers and command centers the tools to work decisively under pressure. These applications enable dispatchers to speed emergency response, deploy resources for maximum results and provide potentially lifesaving support to your personnel in the field. Command and control software provides the analytical power to recognize trends, maximize effective deployment and anticipate problems before they strike.

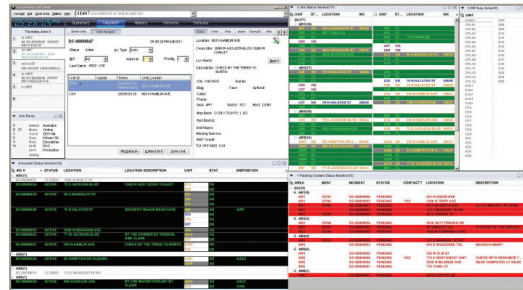
COMPUTER AIDED DISPATCH

Since efficient communications coordination is key for effective use of field resources, we've designed our multimedia PremierOne™ CAD application to be the central convergence point for communications from multiple sources and systems, mission-critical information and resource management. With PremierOne CAD you can:

- Locate first responders with GPS-equipped radios or mobile data applications
- Select real-time video camera feeds directly from your CAD map
- Monitor officer safety with in-vehicle or wearable video cameras
- Update unit status, run queries and text message from portable radios
- Integrate with radio dispatch consoles to quickly handle radio traffic with push-to-talk (PTT) ID and multi-channel select capabilities directly within CAD
- Send photos, video and text messages to field personnel in seconds

Whether deployed in a communications center or in a mobile command post, PremierOne CAD connects resources over both a broadband and narrowband data system. You'll be able to handle calls faster, allocate resources more efficiently,

coordinate seamlessly with other departments and agencies and more effectively serve the community, protect life and preserve property.



PremierOne CAD gives dispatchers crucial data at a glance

GEO SELECT

Utilizing the MotoMapping application, Geo Select allows for automatic talkgroup assignment of resources based on their location. Dispatchers can draw a graphical geo-fence on the MotoMapping application which upon entry, a radio resource will automatically be switched to a pre-determined channel assigned by the dispatcher.

This automates the selection of the interop or command channel established at the incident scene without touching the radio. The hands-free automatic channel change means responders are safer, less prone to errors and can more effortlessly collaborate in their incident response.

THIRD PARTY APPLICATIONS

Motorola works with leading software suppliers to encourage the development of new data applications for ASTRO25 systems. Motorola application developers are engaged in ongoing efforts to introduce new solutions that work with ASTRO 25 Integrated Data, Enhanced Data and HPD to help you accomplish more with your wireless system.

AN ARRAY OF RESOURCES AT YOUR DISPOSAL

Third-party applications are available for a wide range of additional functionality including:

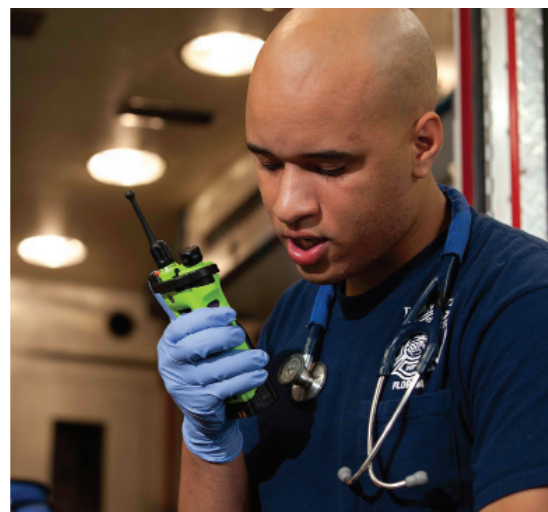
- Biometrics
- Fireground Accountability
- Fire Station Alerting
- GPS and AVL Location
- Mass Notification and Alerting
- Network Monitoring and Performance Management

DEVELOPER'S PROGRAM

Motorola's Application Partner Program encourages developers to continue creating new applications. ASTRO 25 Integrated Data, Enhanced Data and HPD are IP-based systems that can host a variety of standardized applications developed by independent software companies and system integrators.

Motorola provides APIs for outdoor location allowing third party developers to easily integrate this data into their applications for transparent information sharing. These APIs make it easy for third party developers to add on specific customer applications while customers continue to enjoy the benefits of an ASTRO 25 critical voice system with the robust features and reliability need for mission critical communications.





Consider all the advantages of ASTRO 25 and data applications and consult with a Motorola specialist to create a solution that fits your needs and budget. With our extensive experience in delivering hardware, software, service and support, we can help you assess current capabilities, measure system baseline and design or upgrade a system to optimize communications. To learn more, contact your Motorola representative or visit motorolasolutions.com/ASTRO25.

Motorola Solutions, Inc. 1301 E. Algonquin Road, Schaumburg, Illinois 60196 U.S.A. motorolasolutions.com

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